

Migration Center

User Guide

Issue 22
Date 2025-02-14



Copyright © Huawei Technologies Co., Ltd. 2025. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Technologies Co., Ltd.

Trademarks and Permissions



HUAWEI and other Huawei trademarks are trademarks of Huawei Technologies Co., Ltd.

All other trademarks and trade names mentioned in this document are the property of their respective holders.

Notice

The purchased products, services and features are stipulated by the contract made between Huawei and the customer. All or part of the products, services and features described in this document may not be within the purchase scope or the usage scope. Unless otherwise specified in the contract, all statements, information, and recommendations in this document are provided "AS IS" without warranties, guarantees or representations of any kind, either express or implied.

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.

Security Declaration

Vulnerability

Huawei's regulations on product vulnerability management are subject to the *Vul. Response Process*. For details about this process, visit the following web page:

<https://www.huawei.com/en/psirt/vul-response-process>

For vulnerability information, enterprise customers can visit the following web page:

<https://securitybulletin.huawei.com/enterprise/en/security-advisory>

Contents

1 New Edition.....	1
1.1 Permissions Management.....	1
1.1.1 Creating a User and Granting MgC Permissions.....	1
1.1.2 MgC Custom Policies.....	6
1.1.3 Agency Permissions.....	7
1.1.4 IAM User Permissions.....	17
1.2 Settings Management.....	18
1.2.1 Managing Projects.....	19
1.2.2 Managing Credentials.....	21
1.3 Surveys.....	22
1.3.1 TCO Analysis for On-Prem to Cloud Migration.....	22
1.3.2 Credential-based TCO Analysis for Cross-Cloud Migration.....	31
1.3.3 Bill-based TCO Analysis for Cross-Cloud Migration.....	34
1.3.4 Questionnaires.....	40
1.3.5 Storage Migration Cost Survey.....	41
1.4 Resource Discovery.....	41
1.4.1 Online Discovery.....	41
1.4.2 Intranet Discovery.....	51
1.4.3 Importing RVTools Data.....	56
1.4.4 Importing Details of Alibaba Cloud Resources.....	58
1.4.5 Importing Application Associations.....	63
1.4.6 Importing Discovery Results.....	64
1.4.7 Manually Adding Resources.....	65
1.4.8 Collecting Server Performance Data.....	68
1.4.9 Grouping Resources as Applications.....	70
1.5 Application Management.....	71
1.5.1 Creating an Application.....	71
1.5.2 Adding Discovered Resources to an Application.....	72
1.5.3 Manually Adding Custom Resources to an Application.....	73
1.5.4 Collecting Server Performance Data.....	75
1.6 Migration Preparations.....	78
1.6.1 Deploying the MgC Agent (Formerly Edge).....	78
1.6.2 Collecting Metadata.....	85

1.6.2.1 Creating a Metadata Connection.....	85
1.6.2.2 Creating a Metadata Collection Task.....	97
1.6.2.3 Creating a Data Lake Metadata Collection Task.....	99
1.6.2.4 Viewing Metadata.....	101
1.6.3 Collecting Data Lineage.....	103
1.6.3.1 Overview.....	103
1.6.3.2 Exporting Jobs.....	103
1.6.3.3 Creating a Lineage Collection Task.....	105
1.6.3.4 Viewing Data Lineage.....	107
1.7 Migration Solutions.....	108
1.7.1 Associating Source Servers with Target Servers.....	108
1.7.2 Getting Target Recommendations.....	109
1.7.3 Purchasing Resources.....	115
1.7.4 Assessing Migration Risks.....	116
1.8 Migration Plans.....	119
1.8.1 Creating a Server Migration Plan.....	119
1.8.2 Creating a Batch Storage Migration Plan.....	129
1.8.3 Creating a Batch File Storage Migration Plan.....	131
1.9 Migration Clusters.....	136
1.9.1 Creating a Migration Cluster.....	136
1.9.2 Managing a Migration Cluster.....	142
1.9.3 Billing.....	143
1.9.4 Cluster Statuses.....	143
1.9.5 Migration Cluster Resources and Settings.....	144
1.10 Migration Workflows.....	153
1.10.1 Workflow Quotas.....	153
1.10.2 Creating a Server Migration Workflow.....	153
1.10.3 Creating a Cross-AZ Migration Workflow.....	164
1.10.4 Creating a Storage Migration Workflow.....	166
1.10.5 Creating a Batch Object Storage Migration Workflow.....	184
1.10.6 Creating a Batch File Storage Migration Workflow.....	190
1.10.7 Adding a Stage or Step.....	194
1.11 Big Data Migration (from MaxCompute to DLI).....	195
1.11.1 Overview.....	195
1.11.2 Before You Start.....	196
1.11.3 Preparations.....	197
1.11.4 Creating a Source Connection.....	207
1.11.5 Creating a Target Connection.....	209
1.11.6 Creating a Migration Task.....	211
1.11.6.1 Migrating Full Metadata.....	211
1.11.6.2 Scanning for Incremental Metadata.....	216
1.11.6.3 Migrating Full Data.....	221

1.11.6.4 Migrating Incremental Data.....	228
1.11.7 Viewing and Exporting Task Execution Results.....	236
1.11.8 Custom Parameters.....	237
1.12 Big Data Verification.....	240
1.12.1 Overview.....	240
1.12.2 Preparations.....	243
1.12.3 Creating a Source Connection.....	244
1.12.3.1 Creating a Connection to a Source Cloud Service.....	244
1.12.3.2 Creating a Connection to a Source Component.....	246
1.12.4 Creating a Table Group and Adding Tables to the Group.....	257
1.12.5 Creating a Target Connection.....	259
1.12.5.1 Creating an Executor Connection.....	259
1.12.5.2 Creating a Connection to a Target Cloud Service.....	261
1.12.5.3 Creating a Connection to a Target Component.....	264
1.12.6 Creating and Executing Verification Tasks.....	271
1.12.7 Viewing and Exporting Verification Results.....	302
1.12.8 Custom Parameters.....	304
2 Old Edition.....	307
2.1 Permissions Management.....	307
2.1.1 Creating a User and Granting MgC Permissions.....	307
2.1.2 MgC Custom Policies.....	312
2.1.3 Agency Permissions.....	313
2.1.4 IAM User Permissions.....	323
2.2 Settings Management.....	325
2.2.1 Managing Migration Projects.....	325
2.2.2 Managing Credentials.....	327
2.3 Migration Surveys.....	329
2.3.1 TCO Analysis (Credential).....	329
2.3.2 TCO Analysis (Bill).....	333
2.3.3 Questionnaires.....	338
2.3.4 Storage Migration Cost Survey.....	339
2.4 Resource Discovery.....	339
2.4.1 Complex Project.....	339
2.4.1.1 Discovering Resources over the Internet.....	339
2.4.1.2 Discovering Resources over an Intranet.....	351
2.4.1.3 Importing Application Associations.....	354
2.4.1.4 Importing Discovery Results.....	355
2.4.1.5 Importing Details of Alibaba Cloud Resources.....	356
2.4.1.6 Importing RVTools Data.....	360
2.4.2 Simple Project.....	363
2.4.2.1 Discovering Resources over the Internet.....	363
2.4.2.2 Discovering Resources over an Intranet.....	374

2.4.2.3 Importing Details of Alibaba Cloud Resources.....	377
2.4.2.4 Importing RVTools Data.....	381
2.4.3 Manually Adding Resources.....	384
2.4.4 Collecting Server Performance Data.....	388
2.4.5 Grouping Resources as Applications.....	390
2.5 Application Management.....	390
2.5.1 Creating an Application.....	390
2.5.2 Adding Discovered Resources to an Application.....	392
2.5.3 Manually Adding Custom Resources to an Application.....	393
2.5.4 Collecting Server Performance Data.....	396
2.5.5 Viewing Application Dependencies.....	398
2.6 Big Data Lineage.....	399
2.6.1 Installing Edge.....	399
2.6.2 Collecting Metadata.....	400
2.6.2.1 Creating a Metadata Connection.....	400
2.6.2.2 Creating a Metadata Collection Task.....	408
2.6.2.3 Creating a Data Lake Metadata Collection Task.....	410
2.6.2.4 Viewing Metadata.....	412
2.6.3 Collecting Data Lineage.....	414
2.6.3.1 Overview.....	414
2.6.3.2 Exporting Jobs.....	415
2.6.3.3 Creating a Lineage Collection Task.....	417
2.6.3.4 Viewing Data Lineage.....	419
2.7 Migration Solutions.....	420
2.7.1 Associating Source Servers with Target Servers.....	420
2.7.2 Getting Target Recommendations.....	421
2.7.3 Purchasing Resources.....	426
2.7.4 Assessing Migration Risks.....	427
2.8 Migration Plans.....	430
2.8.1 Creating a Server Migration Plan.....	430
2.8.2 Creating a Batch Storage Migration Plan.....	440
2.8.3 Creating a Batch File Storage Migration Plan.....	442
2.9 Migration Clusters.....	447
2.9.1 Creating a Migration Cluster.....	447
2.9.2 Managing a Migration Cluster.....	453
2.9.3 Billing.....	454
2.9.4 Cluster Statuses.....	454
2.9.5 Migration Cluster Resources and Settings.....	455
2.10 Migration Workflows.....	464
2.10.1 Workflow Quotas.....	464
2.10.2 Creating a Server Migration Workflow.....	464
2.10.3 Creating a Cross-AZ Migration Workflow.....	472

2.10.4 Creating a Storage Migration Workflow.....	474
2.10.5 Creating a Batch Object Storage Migration Workflow.....	491
2.10.6 Creating a Batch File Storage Migration Workflow.....	495
2.10.7 Adding a Stage or Step.....	499
2.11 Big Data Migration.....	500
2.11.1 Precautions.....	500
2.11.2 Preparations.....	501
2.11.3 Creating a Source Connection.....	511
2.11.4 Creating a Target Connection.....	513
2.11.5 Migrating Big Data.....	515
2.11.5.1 Migrating Full Metadata.....	515
2.11.5.2 Scanning for Incremental Metadata.....	521
2.11.5.3 Migrating Full Data.....	526
2.11.5.4 Migrating Incremental Data.....	532
2.11.6 Viewing and Exporting Task Execution Results.....	539
2.11.7 Custom Parameters.....	540
2.12 Big Data Verification.....	543
2.12.1 Overview.....	543
2.12.2 Preparations.....	545
2.12.3 Creating a Connection to the Source.....	546
2.12.3.1 Creating a Connection to a Source Cloud Service.....	546
2.12.3.2 Creating a Connection to a Source Component.....	548
2.12.4 Creating a Table Group and Adding Tables to the Group.....	554
2.12.5 Creating a Connection to the Target.....	556
2.12.5.1 Creating an Executor Connection.....	556
2.12.5.2 Creating a Connection to a Target Cloud Service.....	558
2.12.5.3 Creating a Connection to a Target Component.....	560
2.12.6 Creating and Executing Verification Tasks.....	563
2.12.7 Viewing and Exporting Verification Results.....	593
2.12.8 Custom Parameters.....	594

1 New Edition

1.1 Permissions Management

1.1.1 Creating a User and Granting MgC Permissions

This section describes how to use [Identity and Access Management \(IAM\)](#) for fine-grained permissions control on your Migration Center (MgC) resources. With IAM, you can:

- Create IAM users for employees based on the organizational structure of your enterprise. Each IAM user has their own security credentials for accessing MgC resources.
- Grant only the permissions required for users to perform a specific task.
- Entrust a Huawei Cloud account or cloud service to perform professional and efficient O&M on your MgC resources.

If your Huawei Cloud account does not need individual IAM users, then you may skip over this section.

This section describes the procedure for granting permissions (see [Process Flow](#)).

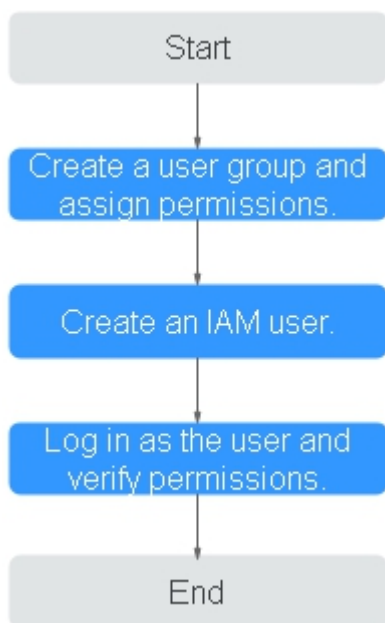
Prerequisites

Before assigning permissions to user groups, you should learn about system-defined policies supported by MgC and select the policies based on service requirements.

For details about the system-defined policies supported by MgC and the comparison between them, see [System-defined Policies](#). For the system-defined policies of other services, see [System-defined Permissions](#).

Process Flow

Figure 1-1 Granting MgC permissions to users



1. **Create a user group and assign permissions** to it.
 - **System-defined policy:** Create a user group on the IAM console, and assign the MgC system-defined policies to the user group based on the [Description of MgC System-defined Policies](#) and actual permissions requirements. Select **All Resources** for **Scope**.

Table 1-1 MgC system-defined policies

Policy Name	Description	Policy Type	Policy Content
MgC FullAccess	Administrator permissions for MgC. Users with these permissions can perform all operations on MgC data.	System-defined policy	MgC FullAccess Policy Content
MgC ReadOnlyAccess	Read-only permissions for MgC. Users with permissions can only view MgC data.	System-defined policy	MgC ReadOnlyAccess Policy Content

Policy Name	Description	Policy Type	Policy Content
MgC DiscoveryAccess	Permissions for resource discovery of MgC. Users with these permissions can use the resource discovery function of MgC and view MgC data.	System-defined policy	MgC DiscoveryAccess Policy Content
MgC AssessAccess	Permissions for application assessment of MgC. Users with these permissions can use the resource discovery and application assessment functions of MgC and view MgC data.	System-defined policy	MgC AssessAccess Policy Content
MgC MigrateAccess	Permissions for application migration of MgC. Users with these permissions can use the resource discovery, application assessment, and application migration functions of MgC and view MgC data.	System-defined policy	MgC MigrateAccess Policy Content
MgC AppDiscoveryAccess	Permissions for resource discovery of MgC. Users with these permissions can use the resource discovery and data collection functions of MgC and view MgC data.	System-defined policy	MgC AppDiscoveryAccess Policy Content
MgC MrrAccess	Permissions for service verification of MgC. Users with these permissions can use the service verification function of MgC and view MgC data.	System-defined policy	MgC MrrAccess Policy Content

- **Custom policy:** If an IAM user only needs specific MgC permissions, create custom policies. For details, see [MgC Custom Policies](#).
2. **Create an IAM user and add it to the user group.**
Create a user on the IAM console and add the user to the group created in 1.

NOTICE

When the IAM user accesses certain MgC functions for the first time, the IAM user needs to complete authorization through agencies in either of the following ways:

- (Recommended) Ask the administrator to log in to the MgC console and access the corresponding functions to complete the authorization.
- Ask the administrator to grant the corresponding system-defined MgC permissions and the **iam:agencies:createAgency**, **iam:permissions:grantRoleToAgency**, and **iam:roles:updateRole** permissions on the IAM console.

3. **Sign in** and verify permissions.

Sign in to the IAM console using the created IAM user, and in the authorized region, perform the following operations:

- Choose **Service List > Migration Center**. On the MgC console, perform operations based on the granted permissions. If you can, the granted permissions have taken effect.
- Choose another service from **Service List**. If a message appears indicating that you have insufficient permissions to access the service, the granted permissions have taken effect.

MgC FullAccess Policy Content

```
{
  "Version": "1.1",
  "Statement": [
    {
      "Action": [
        "mgc:*:*",
        "iam:agencies:listAgencies",
        "iam:roles:listRoles",
        "iam:quotas:listQuotas",
        "iam:permissions:listRolesForAgency"
      ],
      "Effect": "Allow"
    }
  ]
}
```

MgC ReadOnlyAccess Policy Content

```
{
  "Version": "1.1",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "mgc:*:query*"
      ]
    }
  ]
}
```

MgC DiscoveryAccess Policy Content

```
{
  "Version": "1.1",
  "Statement": [
```

```
{
  "Effect": "Allow",
  "Action": [
    "mgc:*:query*",
    "mgc:*:discovery"
  ]
}
```

MgC AssessAccess Policy Content

```
{
  "Version": "1.1",
  "Statement": [
    {
      "Action": [
        "mgc:*:query*",
        "mgc:*:discovery",
        "mgc:*:assess",
        "iam:agencies:listAgencies",
        "iam:roles:listRoles",
        "iam:quotas:listQuotas",
        "iam:permissions:listRolesForAgency"
      ],
      "Effect": "Allow"
    }
  ]
}
```

MgC MigrateAccess Policy Content

```
{
  "Version": "1.1",
  "Statement": [
    {
      "Action": [
        "mgc:*:query*",
        "mgc:*:discovery",
        "mgc:*:assess",
        "mgc:*:migrate",
        "iam:agencies:listAgencies",
        "iam:roles:listRoles",
        "iam:quotas:listQuotas",
        "iam:permissions:listRolesForAgency"
      ],
      "Effect": "Allow"
    }
  ]
}
```

MgC AppDiscoveryAccess Policy Content

```
{
  "Version": "1.1",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "mgc:*:query*",
        "mgc:*:discovery",
        "mgc:*:appdiscovery"
      ]
    }
  ]
}
```

MgC MrrAccess Policy Content

```
{
  "Version": "1.1",
  "Statement": [
    {
      "Action": [
        "mgc:*:query*",
        "mgc:mrr:query",
        "mgc:mrr:update",
        "mgc:mrr:export",
        "mgc:mrr:import",
        "mgc:mrr:upgrade",
        "mgc:mrr:delete",
        "mgc:mrr:check"
      ],
      "Effect": "Allow"
    }
  ]
}
```

1.1.2 MgC Custom Policies

Custom policies can be created to supplement the system-defined policies of MgC.

You can create custom policies in either of the following ways:

- Visual editor: Select cloud services, actions, resources, and request conditions. This does not require knowledge of policy syntax.
- JSON: Create a JSON policy from scratch or based on an existing policy.

For details, see [Creating a Custom Policy](#). The following section contains examples of common MgC custom policies.

Example MgC Custom Policies

- Allowing users to perform platform collection and resource management

```
{
  "Version": "1.1",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "mgc:*:query*",
        "mgc:*:discovery"
      ]
    }
  ]
}
```

- Allowing users to perform TCO analysis and server assessment

```
{
  "Version": "1.1",
  "Statement": [
    {
      "Action": [
        "mgc:*:query*",
        "mgc:*:discovery",
        "mgc:*:assess",
        "iam:agencies:listAgencies",
      ],
      "Effect": "Allow"
    }
  ]
}
```

- ```
]
}
```
- Allowing users to perform application dependency mapping

```
{
 "Version": "1.1",
 "Statement": [
 {
 "Effect": "Allow",
 "Action": [
 "mgc:*:query*",
 "mgc:*:discovery",
 "mgc:*:appdiscovery"
]
 }
]
}
```
  - Allowing users to use migration workflows

```
{
 "Version": "1.1",
 "Statement": [
 {
 "Effect": "Allow",
 "Action": [
 "mgc:*:query*",
 "mgc:*:discovery",
 "mgc:*:assess",
 "mgc:*:migrate",
 "iam:agencies:listAgencies"
]
 }
]
}
```

## 1.1.3 Agency Permissions

### Overview

To use some functions of MgC, you must delegate MgC the required permissions so that we can provide you with complete services. This section describes the scenarios where authorization is required and what custom permission policies will be created.

The system may create a new custom policy or update an existing policy during the authorization.

- If there is no available custom policy, the system automatically creates a new one. For details about how to create a custom policy, see [Creating a Custom Policy](#).
- If there is an available custom policy but it does not contain required permissions, the system automatically updates the policy.

## Creating a Cross-AZ Migration Workflow

| Scenario                               | Delegated Object | Custom Policy                  | Minimal Permissions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------|------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Creating a cross-AZ migration workflow | MgC              | MgC<br>AzMigrationAgencyPolicy | ecs:cloudServers:showServer (Querying details about an ECS)<br>ecs:flavors:get (Querying ECS flavors)<br>ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information)<br>ecs:cloudServerQuotas:get (Querying quotas of a tenant)<br>ecs:servers:list (Querying ECSs)<br>ecs:cloudServers:list (Querying details about ECSs)<br>ecs:servers:stop (Stopping an ECS)<br>ecs:cloudServers:listServerInterfaces (Querying NICs of an ECS)<br>ecs:cloudServers:createServers (Creating an ECS)<br>ecs:cloudServers:listServerBlockDevices (Querying information about the disks attached to an ECS)<br>ecs:cloudServerNics:update (Configuring a private IP address for a NIC of an ECS)<br>ecs:availabilityZones:list (Listing AZs)<br>ecs:servers:start (Starting an ECS)<br>ecs:cloudServers:changeNetworkInterface (Updating attributes of a specified NIC on an ECS)<br>ecs:serverInterfaces:get (Querying ECS NICs)<br>ecs:cloudServers:get (Querying details about an ECS)<br>vpc:publicIps:create (Creating an EIP)<br>vpc:publicIps:update (Updating an EIP)<br>vpc:subnets:get (Querying subnets or querying details about a subnet)<br>vpc:networks:get (Querying networks)<br>vpc:publicIps:list (Querying EIPs) |



| Scenario | Delegated Object | Custom Policy | Minimal Permissions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------|------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |                  |               | <p>vpc:publicIps:list (Querying details about an EIP)</p> <p>vpc:ports:get (Querying ports or querying details about a port)</p> <p>vpc:ports:delete (Deleting a port)</p> <p>vpc:ports:update (Updating a port)</p> <p>vpc:ports:create (Creating a port)</p> <p>evs:types:get (Querying EVS disk types)</p> <p>evs:volumes:list (Querying EVS disks)</p> <p>cbr:vaults:get (Querying a specified vault)</p> <p>cbr:vaults:list (Querying vaults)</p> <p>cbr:vaults:create (Creating a vault)</p> <p>cbr:vaults:addResources (Associating resources)</p> <p>cbr:vaults:backup (Creating a restore point)</p> <p>cbr:backups:list (Querying backups)</p> <p>cbr:tasks:list (Querying tasks)</p> <p>cbr:tasks:get (Querying details about a task)</p> <p>cbr:backups:delete (Deleting a backup)</p> <p>cbr:backups:get (Querying a backup)</p> <p>cbr:vaults:delete (Deleting a vault)</p> <p>ims:wholeImages:create (Creating a full-ECS image)</p> <p>ims:images:list (Querying images)</p> <p>ims:images:delete (Deleting an image)</p> <p>ims:images:get (Querying details about an image)</p> <p>ims:serverImages:create (Creating an image)</p> |

## Migration Cost Analysis

| Scenario                                | Delegated Object | Custom Policy          | Minimal Permissions                                                                                                                                                                                                     |
|-----------------------------------------|------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Creating a migration cost analysis task | MgC              | MgC<br>TcoAgencyPolicy | ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information)<br>evs:types:get (Querying EVS disk types)<br>ims:*:get* (Querying details about an image)<br>ims:*:list* (Querying images) |

## Getting Target Recommendations

| Scenario                       | Delegated Object | Custom Policy                   | Minimal Permissions                                                                                                                                                                                                                                                             |
|--------------------------------|------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Getting target recommendations | MgC              | MgC<br>ServerAssessAgencyPolicy | ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information)<br>ims:images:list (Querying images)<br>evs:types:get (Querying EVS disk types)<br>deh:dedicatedHosts:get (Obtaining details about a DeH)<br>deh:dedicatedHosts:list (Listing DeHs) |

## Binding a Source Server to an Existing Target Server

| Scenario                                             | Delegated Object | Custom Policy                       | Minimal Permissions                                                                                                                                                                                 |
|------------------------------------------------------|------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Binding a source server to an existing target server | MgC              | MgC<br>ServerBindTargetAgencyPolicy | ecs:cloudServers:showServer (Querying details about an ECS)<br>evs:volumes:list (Querying EVS disks)<br>ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information) |

## Creating a Server Migration Workflow

| Scenario                             | Delegated Object | Custom Policy                      | Minimal Permissions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------|------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Creating a Server Migration Workflow | MgC              | MgC<br>ServerMigrationAgencyPolicy | ecs:cloudServers:showServer (Querying details about an ECS)<br>ecs:cloudServers:createServers (Creating an ECS)<br>sms:server:migrationServer (Migrating a source server)<br>sms:server:queryServer (Querying source servers)<br>ecs:cloudServers:list (Querying ECSs)<br>ecs:cloudServers:listServerBlockDevices (Querying information about the disks attached to an ECS)<br>ecs:cloudServerQuotas:get (Querying quotas of a tenant)<br>vpc:publicIps:create (Creating an EIP)<br>vpc:privateIps:list (Querying private IP addresses)<br>ecs:cloudServers:get (Querying details about an ECS)<br>ecs:cloudServers:changeVpc (Changing a VPC for an ECS)<br>ecs:cloudServers:attach (Attaching a disk to an ECS)<br>ecs:cloudServers:start (Starting ECSs in batches)<br>ecs:cloudServers:detachVolume (Detaching a disk from a specified ECS)<br>ecs:cloudServers:stop (Stopping ECSs in batches)<br>ecs:servers:unlock (Unlocking an ECS)<br>evs:volumes:delete (Deleting an EVS disk)<br>evs:volumes:use (Attaching and detaching EVS disks)<br>evs:volumes:get (Querying details about an EVS disk) |

| Scenario                                                                      | Delegated Object | Custom Policy                          | Minimal Permissions                                                                                                                      |
|-------------------------------------------------------------------------------|------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                               |                  |                                        | ims:images:get (Querying details about an image)                                                                                         |
| Enabling the option to retain IP addresses during a server migration workflow | MgC              | MgC ServerMigrationIp-KeepAgencyPolicy | vpc:subnets:get (Querying subnets or querying details about a subnet)<br>ecs:cloudServers:listServerInterfaces (Querying NICs of an ECS) |

## Purchasing Resources

| Scenario             | Delegated Object | Custom Policy            | Minimal Permissions                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------|------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Purchasing resources | MgC              | MgC PurchaseAgencyPolicy | eps:resources:add (Adding resources to an enterprise project)<br>ecs:cloudServers:createServers (Creating an ECS)<br>evs:volumes:list (Querying EVS disks)<br>ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information)<br>ecs:cloudServers:list (Querying details about ECSs)<br>vpc:publicIps:update (Updating an EIP)<br>vpc:publicIps:create (Creating an EIP) |

## Configuring a Server Purchase Template

| Scenario                               | Delegated Object | Custom Policy                    | Minimal Permissions                                                                                                                                                                                                                                                                                                        |
|----------------------------------------|------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Configuring a server purchase template | MgC              | MgC PurchaseTemplateAgencyPolicy | iam:projects:listProjects (Querying projects)<br>eps:enterpriseProjects:list (Listing enterprise projects)<br>vpc:subnets:get (Querying subnets or querying details about a subnet)<br>vpc:securityGroups:get (Querying security groups or querying details about a security group)<br>vpc:vpcs:get (Querying VPC details) |

## Creating Migration Plans

| Scenario                                                                                     | Delegated Object | Custom Policy                             | Minimal Permissions                                                                                                                                                  |
|----------------------------------------------------------------------------------------------|------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Creating a server migration plan (importing target server configurations from an OBS bucket) | MgC              | MgC ImportTargetConfigurationAgencyPolicy | obs:object:GetObject (Obtaining object content and metadata)<br>obs:bucket:ListBucket (Listing objects in a bucket)<br>obs:bucket:ListAllMyBuckets (Listing buckets) |
| Creating a server migration plan (exporting target server configurations)                    |                  | MgC ExportTargetConfigurationAgencyPolicy | ims:images:list (Listing images)<br>ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information)                                      |

| Scenario                                                                    | Delegated Object | Custom Policy                          | Minimal Permissions                                                                                                                                                                                      |
|-----------------------------------------------------------------------------|------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Creating a server migration plan - verifying server quota                   |                  | MgC ServerMigration-QuotasAgencyPolicy | ecs:cloudServers:list (Querying details about ECSs)<br>evs:quotas:get (Querying EVS disk quotas)<br>ecs:cloudServerQuotas:get (Querying quotas of a tenant)<br>vpc:quotas:list (Listing resource quotas) |
| Creating a batch object storage migration plan (configuring target buckets) |                  | MgC ListObsBucketsAgencyPolicy         | obs:bucket:ListBucket (Listing objects in a bucket)<br>obs:bucket:ListAllMyBuckets (Listing buckets)                                                                                                     |

## Creating a Migration Cluster

| Scenario                     | Delegated Object | Custom Policy                   | Minimal Permissions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------|------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Creating a migration cluster | OMS              | OMS<br>ObsMigrationAgencyPolicy | ecs:cloudServers:createServers (Creating an ECS)<br>ecs:cloudServers:listServerInterfaces (Querying NICs of an ECS)<br>ecs:cloudServers:showServer (Querying details about an ECS)<br>ecs:cloudServers:deleteServers (Deleting ECSs)<br>nat:natGateways:create (Creating a NAT Gateway)<br>nat:natGateways:get (Querying details about a NAT gateway)<br>nat:natGateways:delete (Deleting a NAT gateway)<br>nat:snatRules:create (Creating an SNAT rule)<br>nat:snatRules:get (Querying details about an SNAT rule)<br>nat:dnatRules:list (Querying DNAT rules)<br>nat:dnatRules:list (Querying DNAT rules)<br>nat:snatRules:delete (Deleting an SNAT rule)<br>vpc:securityGroups:create (Creating a security group)<br>vpc:securityGroups:delete (Deleting a security group)<br>vpc:securityGroups:get (Querying security groups or querying details about a security group)<br>vpc:securityGroupRules:create (Creating a security group rule)<br>vpc:securityGroupRules:get (Querying security group rules or querying details about a security group rule)<br>vpc:securityGroupRules:delete (Deleting a security group rule)<br>vpcep:epservices:create (Creating a VPC endpoint service) |

| Scenario | Delegated Object | Custom Policy                   | Minimal Permissions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------|------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |                  |                                 | vpcep:epservices:get (Querying details about a VPC endpoint service)<br>vpcep:epservices:delete (Deleting a VPC endpoint service)<br>vpcep:connections:update (Accepting or rejecting a VPC endpoint)<br>vpcep:permissions:update (Batch adding or deleting whitelist records of a VPC endpoint service)<br>lts:topics:create (Creating a log topic)<br>lts:topics:delete (Deleting a log topic)<br>lts:groups:create (Creating a log group)<br>lts:groups:get (Querying details about a log group)<br>lts:groups:delete (Deleting a log group)<br>ims:images:list (Listing images) |
|          | ECS              | ECS<br>ObsMigrationAgencyPolicy | apm:icmgr:* (Full permissions for the APM collection component)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## Creating a Storage Migration Workflow

| Scenario                              | Delegated Object | Custom Policy | Minimal Permissions                                                        |
|---------------------------------------|------------------|---------------|----------------------------------------------------------------------------|
| Creating a storage migration workflow | MgC              | -             | OMS Administrator (system-defined role, the administrator role of the OMS) |



## Importing RVTools Data

| Scenario               | Delegated Object | Custom Policy                        | Minimal Permissions                                                                                                                                                         |
|------------------------|------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Importing RVTools data | MgC              | MgC<br>OfflineCollectionAgencyPolicy | obs:object:GetObject<br>(Obtaining object content and metadata)<br>obs:bucket:ListBucket (Listing objects in a bucket)<br>obs:bucket:ListAllMyBuckets<br>(Querying buckets) |

### 1.1.4 IAM User Permissions

With IAM, you can grant fine-grained permissions to IAM users under your account by configuring permission policies.

The following table lists the permissions that are required for IAM users to use different MgC functions. For details about how to configure permission policies, see [Creating a Custom Policy](#).

| Function                               | Permission                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Configuring a server purchase template | vpc:vpcs:list (Listing VPCs)<br>vpc:subnets:get (Querying subnets or querying details about a subnet)<br>vpc:publicips:list (Querying EIPs)<br>vpc:securityGroups:get (Querying security groups or querying details about a security group)<br>eps:enterpriseProjects:list (Listing enterprise projects)<br>ecs:availabilityZones:list (Listing AZs)                                                                                                                              |
| Creating a server migration workflow   | vpc:vpcs:list (Listing VPCs)<br>vpc:vpcs:get (Querying VPC details)<br>vpc:subnets:get (Querying subnets or querying details about a subnet)<br>vpc:publicips:list (Querying EIPs)<br>vpc:publicips:get (Querying details about an EIP)<br>vpc:securityGroups:get (Querying security groups or querying details about a security group)<br>eps:enterpriseProjects:list (Listing enterprise projects)<br>eps:enterpriseProjects:get (Querying details about an enterprise project) |

| Function                                      | Permission                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Getting server recommendations                | <p>ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information)</p> <p>ecs:cloudServers:list (Querying details about ECSs)</p> <p>ecs:cloudServers:showServer (Querying details about an ECS)</p> <p>ecs:flavors:get (Querying ECS flavors)</p> <p>ims:images:list (Querying images)</p> <p>ims:images:get (Querying details about an image)</p> <p>evs:volumes:list (Querying EVS disks)</p> <p>evs:types:get (Querying EVS disk types)</p>                                                |
| Creating a Cross-AZ migration workflow        | <p>ecs:availabilityZones:list (Listing AZs)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Configuring Product Mappings for TCO Analysis | <p>ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information)</p> <p>ims:images:list (Querying images)</p> <p>evs:types:get (Querying EVS disk types)</p>                                                                                                                                                                                                                                                                                                                                 |
| Creating a storage migration workflow         | <p>Tenant Guest (read-only permissions for all cloud services except IAM)</p> <p>OMS Administrator (full permissions for OMS)</p>                                                                                                                                                                                                                                                                                                                                                                                          |
| Creating a migration cluster                  | <p>Tenant Guest (read-only permissions for all cloud services except IAM)</p> <p>OMS Administrator (full permissions for OMS)</p> <p>nat:natGateways:list (Querying NAT gateways)</p> <p>smn:topic:list (Querying a topic)</p>                                                                                                                                                                                                                                                                                             |
| Creating an Agency                            | <p>iam:agencies:listAgencies (Querying agencies based on specified conditions)</p> <p>iam:roles:listRoles (Listing permissions)</p> <p>iam:quotas:listQuotas (Listing quotas)</p> <p>iam:permissions:listRolesForAgency (Listing permissions of an agency)</p> <p>iam:agencies:createAgency (Creating an agency)</p> <p>iam:permissions:grantRoleToAgency (Granting specified permissions to an agency)</p> <p>iam:roles:createRole (Creating a custom policy)</p> <p>iam:roles:updateRole (Modifying a custom policy)</p> |

## 1.2 Settings Management

## 1.2.1 Managing Projects

### Overview

You can create a project to segregate and manage your migration resources. Two types of projects are available for different migration cases.

- **Application migration:** This type of projects applies to discovery and migration of server and storage resources.
- **Complex migration (for big data):** This type of projects applies to big data migration and consistency verification.

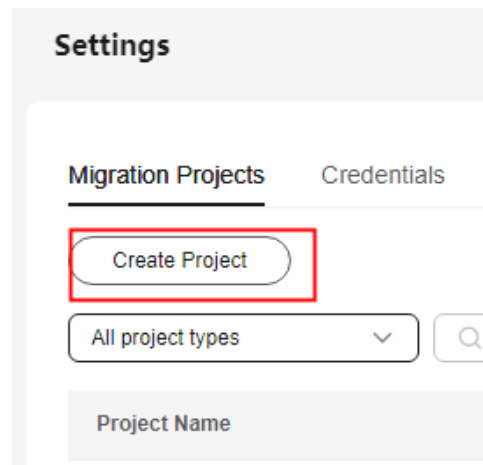
### Creating a Project

**Step 1** Sign in to the [MgC console](#).

**Step 2** In the navigation pane on the left, choose **Settings**.

**Step 3** Under **Migration Projects**, click **Create Project**.

**Figure 1-2** Creating a project



**Step 4** In the dialog box that is displayed, view the application scenarios of each project type, and select a project type as required.

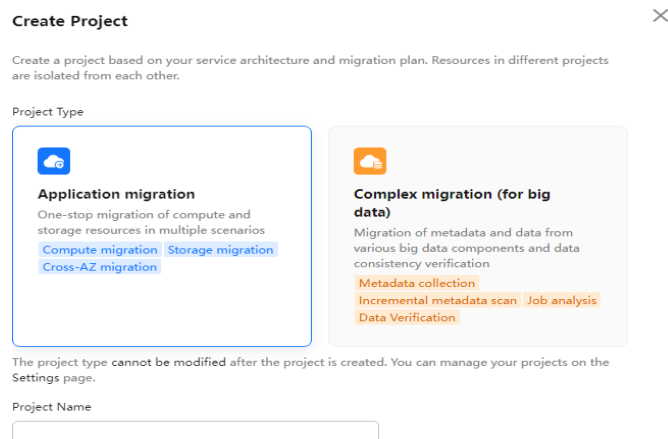
---

#### NOTICE

The project type cannot be changed after the project is created.

---

**Figure 1-3** Selecting a project type



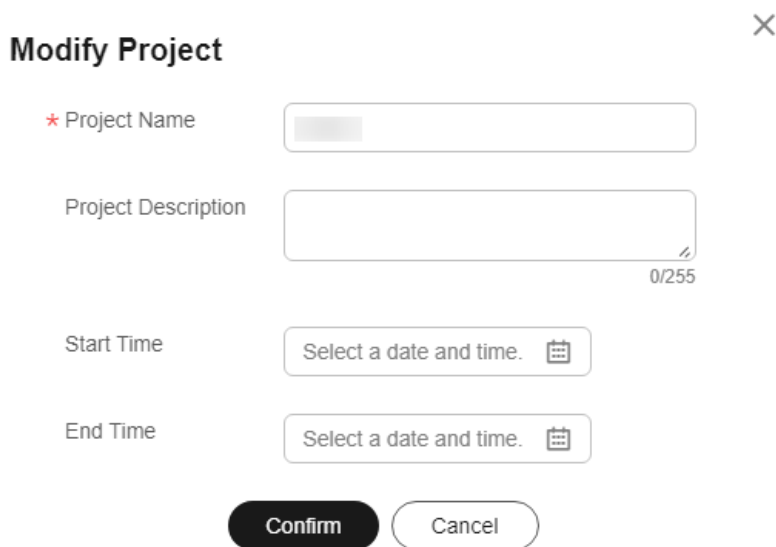
**Step 5** Enter a project name and click **Create**. After the project is created, you can view it in the project list.

----End

## Modifying a Migration Project

**Step 1** Locate the project and click **Modify** in the **Operation** column.

**Step 2** In the displayed dialog box, modify the project name, project description, start time, and end time, and click **Confirm**.



----End

## Archiving a Migration Project

Archived projects will not be displayed in the project drop-down list in the left corner of the page. To archive a project, locate it and click **Archive** in the **Operation** column. To display an archived project in the drop-down list again, you need to unarchive it first.



**NOTE**

The project currently in use cannot be archived.

## 1.2.2 Managing Credentials

Credentials are used by MgC to authenticate your identity during resource discovery and data collection. This section describes how to add credentials required by MgC to discover cloud resources. To learn how to add credentials required for using the MgC Agent to discover on-premises resources or manually adding resources to MgC, see [Adding Resource Credentials](#).

### Supported Authentication Types

Only public cloud credentials can be added. For details about the supported authentication types, see [Table 1-2](#).

**Table 1-2** Supported authentication types for public clouds

| Resource Type | Authentication Type | Description                                                                                                                                                                                                                                                                  |
|---------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Public cloud  | AK/SK               | AK/SK pairs for accessing cloud platforms, such as Huawei Cloud, Alibaba Cloud, AWS, Tencent Cloud, Qiniu Cloud, and Kingsoft Cloud For details about how to obtain AK/SK pairs for cloud platform accounts, see <a href="#">How Do I Obtain Cloud Platform Credentials?</a> |
|               | Configuration file  | Credential configuration files of Google Cloud. A configuration file that contains credentials for Google Cloud service accounts can be uploaded to MgC. The file must be in JSON format and cannot exceed 4 KB.                                                             |
|               | ID/Secret           | Azure credentials. To learn how to obtain Azure credentials, see <a href="#">How Do I Obtain Azure Credentials?</a>                                                                                                                                                          |

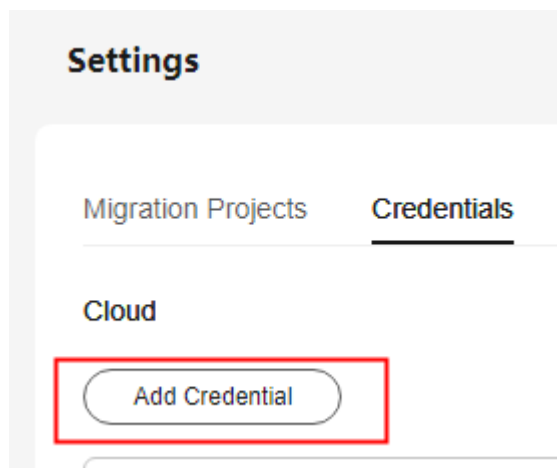
**CAUTION**

Your cloud credentials are stored in the MgC database and remain valid for seven days. After this period, you need to add the credentials to MgC again if you still want to discover or migrate your cloud resources.

## Procedure

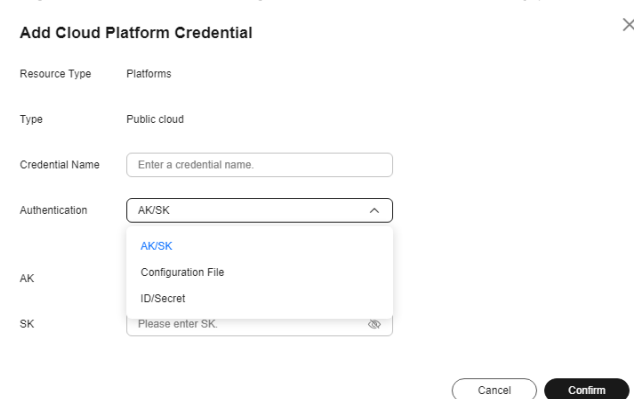
- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, choose a **project** from the drop-down list.
- Step 2** In the navigation pane on the left, choose **Settings**.
- Step 3** On the **Credentials** tab, click **Add Credential**.

**Figure 1-4** Adding a credential



- Step 4** Enter a credential name, select an authentication method, enter or upload the corresponding credentials, and click **Confirm**. After the credential is added, you can choose **Credentials** > **Cloud** to view the added credential.

**Figure 1-5** Selecting an authentication type



----End

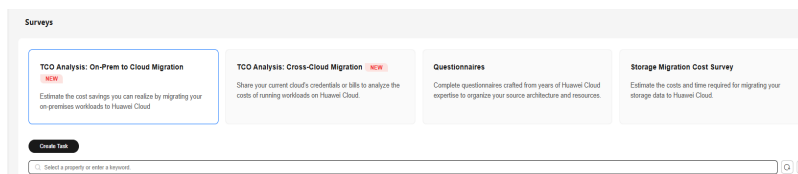
## 1.3 Surveys

### 1.3.1 TCO Analysis for On-Prem to Cloud Migration

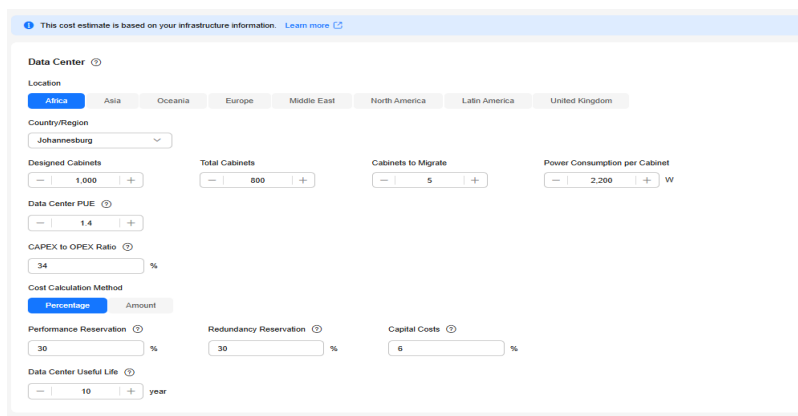
You can specify your on-premises infrastructure details to estimate the cost savings you can realize by migrating on-premises workloads to Huawei Cloud.

## Creating a Task

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, choose a **project** from the drop-down list.
- Step 2** In the navigation pane, choose **Assess > Surveys**.
- Step 3** Under the **TCO Analysis: On-Prem to Cloud Migration** card, click **Create Task**.



- Step 4** Set parameters in the **Data Center** area. For details, see **Table 1-3**.



**Table 1-3** Specifying data center details

| Parameter           | Description                                                                                                                                                         |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Location            | Choose the location where you want to run your workloads. The options include Africa, Asia, Oceania, Europe, Middle East, North America, Latin America, and the UK. |
| Country/Region      | The options vary with the location you choose.                                                                                                                      |
| Designed Cabinets   | The default value is <b>1,000</b> . The value must be an integer from 1 to 99,999.<br><b>NOTE</b><br>Designed Cabinets ≥ Total Cabinets ≥ Cabinets to Migrate       |
| Total Cabinets      | The default value is <b>800</b> . The value must be an integer from 1 to 99,999.<br><b>NOTE</b><br>Designed Cabinets ≥ Total Cabinets ≥ Cabinets to Migrate         |
| Cabinets to Migrate | The default value is <b>5</b> . The value must be an integer from 1 to 99,999.<br><b>NOTE</b><br>Designed Cabinets ≥ Total Cabinets ≥ Cabinets to Migrate           |

| Parameter                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power Consumption per Cabinet | The default value is 2,200 W. The value must be an integer from 1,000 to 30,000.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Data Center PUE               | Power Usage Effectiveness (PUE) is a metric used to measure the energy efficiency of a data center. It is the total amount of energy consumed by a data center divided by the energy used by IT loads.<br>The default value is <b>1.4</b> . The value must be between <b>1</b> and <b>10</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| CAPEX to OPEX Ratio           | The percentage of capital expenditures (CAPEX) to operational expenditures (OPEX) of a data center.<br>The default value is <b>34%</b> . The value must be between <b>1</b> and <b>1,000</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Cost Calculation Method       | Determine how to specify the costs of reserved resources. <ul style="list-style-type: none"> <li>• If you select <b>Percentage</b>, set the following parameters: <ul style="list-style-type: none"> <li>- <b>Performance Reservation</b>: The default value is <b>30%</b>. The value ranges from 1 to 100.</li> <li>- <b>Redundancy Reservation</b>: The default value is <b>30%</b>. The value ranges from 1 to 100.</li> <li>- <b>Capital Costs</b>: The default value is <b>6%</b>. The value ranges from 1 to 100.</li> </ul> </li> <li>• If you select <b>Amount</b>, set the following parameters: <ul style="list-style-type: none"> <li>- <b>Performance Reservation</b>: The default value is <b>100,000</b>. The value ranges from 1 to 1,000,000,000,000,000.</li> <li>- <b>Redundancy Reservation</b>: The default value is <b>10,000</b>. The value ranges from 1 to 1,000,000,000,000,000.</li> <li>- <b>Capital Costs</b>: The default value is <b>10,000</b>. The value ranges from 1 to 1,000,000,000,000,000.</li> </ul> </li> </ul> |
| Data Center Useful Life       | The default value is <b>10</b> . The value must be an integer from 1 to 20.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

**Step 5** Set parameters in the **Servers** area. For details about the parameters, see [Table 1-4](#).



### Servers

CPU Cores ?

-
1,000
+

% of High-Performance CPU Cores ?

20
%

% of Cost-Effective CPU Cores ?

20
%

% of Cost-Optimized CPU Cores ?

60
%

VMware Virtualization

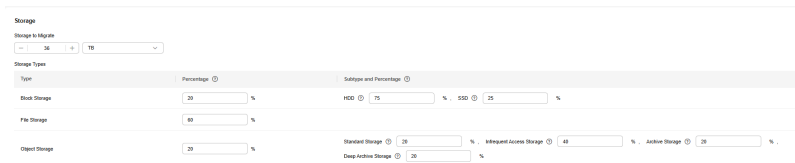
Yes
No

**Table 1-4** Specifying server details

| Parameter                       | Description                                                                                                                                                                                                                                                                                                                       |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU Cores                       | The number of CPU cores to be migrated. The default value is <b>1,000</b> . The value ranges from 1 to 99,999,999.                                                                                                                                                                                                                |
| % of High-performance CPU Cores | For example, databases, streaming, message servers, inference jobs. Huawei Cloud instance series C7 is recommended. The default value is <b>20%</b> .<br><b>NOTE</b><br>The sum of percentages specified for CPU cores for high performance, cost-effectiveness, and cost-optimization must add up to 100%.                       |
| % of Cost-Effective CPU Cores   | For example, microservices, web and application servers, and business intelligence solutions. Huawei Cloud instance series aC7 is recommended. The default value is <b>20%</b> .<br><b>NOTE</b><br>The sum of percentages specified for CPUs for high performance, cost-effectiveness, and cost-optimization must add up to 100%. |

| Parameter                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| % of Cost-Optimized CPU Cores | For example, development/testing, internal applications, and batch processing. Huawei Cloud instance series S7 and Flexus are recommended. The default value is <b>60%</b> .<br><br><b>NOTE</b><br>The sum of percentages specified for CPUs for high performance, cost-effectiveness, and cost-optimization must add up to 100%.                                                                                                                                |
| VMware Virtualization         | The total number of vCPUs hosted on physical CPU cores. If your workloads run on VMs, this number is used to calculate the number of underlying physical servers.<br><br><ul style="list-style-type: none"> <li>If you select <b>No</b>, VMware virtualization is not involved in your source environment.</li> <li>If you select <b>Yes</b>, set the total number of vCPUs. The default value is <b>300</b>. The value ranges from 1 to 100,000,000.</li> </ul> |

**Step 6** Set parameters in the **Storage** area. For details about the parameters, see [Table 1-5](#).



**Table 1-5** Specifying storage details

| Parameter          | Sub-Parameter | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Storage to Migrate | -             | The default value is <b>36</b> . The value ranges from 0 to 999,999. The unit is TB.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Storage Types      | Block Storage | <b>Percentage:</b> Set the percentage of the block storage capacity in the total storage capacity to be migrated. For example, if the total storage capacity to be migrated is 100 TB and the block storage accounts for 20%, the block storage capacity is 20 TB.<br><br><ul style="list-style-type: none"> <li><b>HDD:</b> Set the percentage of the HDD capacity in the block storage capacity.</li> <li><b>SSD:</b> Set the percentage of the SSD capacity in the block storage capacity.</li> </ul> |

| Parameter | Sub-Parameter  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | File Storage   | <b>Percentage:</b> Set the percentage of the file storage capacity in the total storage capacity to be migrated. For example, if the total storage capacity to be migrated is 100 TB and the file storage accounts for 60%, the file storage capacity is 60 TB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|           | Object Storage | <p><b>Percentage:</b> Set the percentage of the object storage capacity in the total storage capacity to be migrated. For example, if the total storage capacity to be migrated is 100 TB and the object storage accounts for 20%, the object storage capacity is 20 TB.</p> <ul style="list-style-type: none"> <li>• <b>Standard Storage:</b> Set the percentage of Standard storage.</li> <li>• <b>Infrequent Access Storage:</b> Set the percentage of Infrequent Access storage.</li> <li>• <b>Archive Storage:</b> Set the percentage of Archive storage.</li> <li>• <b>Deep Archive Storage:</b> Set the percentage of Deep Archive storage.</li> </ul> <p><b>NOTE</b><br/>For details about storage subtypes, see <a href="#">Storage Classes</a>.</p> |

**Step 7** Set the parameters in the **Networking** area. You can dynamically drag the slider or manually enter the monthly network bandwidth. The system will calculate the monthly network costs using the default assumptions. You can also adjust the default assumptions to fit your needs.



**Step 8** Click **Next**. On the displayed **Adjust Assumptions** page, set the parameters listed in [Table 1-6](#).

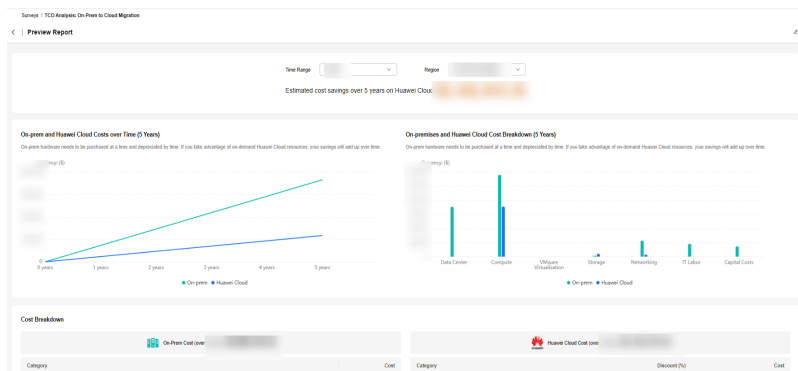
**Table 1-6** Setting assumptions

| Area              | Parameter                  | Description                                                                                                                             |
|-------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Data Center Costs | Time Range                 | Enter an integer from 1 to 5.                                                                                                           |
|                   | Construction Cost per Watt | The cost depends on the data center location you choose. You can also change the default assumption if necessary.                       |
| Hardware Costs    | Cost per Core per Year     | The default assumption is the market reference price. You can calculate it by dividing the physical server cost by the number of cores. |

| Area                 | Parameter                                                             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Software Costs       | Server Software Cost per Year                                         | Set the percentage of the annual software cost used by servers.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                      | Storage Software Cost per Year                                        | Set the percentage of the annual software cost used by storage.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Virtualization Costs | VMware Cost per Core per Year                                         | Set the cost of VMware virtualization software per core per year.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Networking Costs     | Network Cost as a % of Server Cost                                    | Set the percentage of server costs allocated to networks.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                      | Service Provider Cost per Month                                       | The default assumption is calculated using the monthly network bandwidth you configured. You can also change the default assumption if necessary.                                                                                                                                                                                                                                                                                                                                                                |
| Storage Costs        | Block Storage                                                         | <ul style="list-style-type: none"> <li>● <b>HDD Cost per GB per Month:</b> Set the monthly cost per GB for HDD storage.</li> <li>● <b>SSD Cost per GB per Month:</b> Set the monthly cost per GB for SSD storage.</li> </ul>                                                                                                                                                                                                                                                                                     |
|                      | File Storage                                                          | <b>File Storage Cost per GB per Month:</b> Set the monthly cost per GB for file storage.                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                      | Object Storage                                                        | <ul style="list-style-type: none"> <li>● <b>Standard Storage Cost per GB per Month:</b> Set the monthly cost per GB for Standard storage.</li> <li>● <b>Infrequent Access Storage Cost per GB per Month:</b> Set the monthly cost per GB for Infrequent Access storage.</li> <li>● <b>Archive Storage Cost per GB per Month:</b> Set the monthly cost per GB for Archive storage.</li> <li>● <b>Deep Archive Storage Cost per GB per Month:</b> Set the monthly cost per GB for Deep Archive storage.</li> </ul> |
| IT Labor Costs       | Hardware Maintenance Cost as a % of Hardware Cost                     | Set this parameter as needed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                      | Network Maintenance Cost as a % of Network Hardware and Software Cost |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Area | Parameter                                                   | Description |
|------|-------------------------------------------------------------|-------------|
|      | Storage Maintenance Cost as a % of Storage Procurement Cost |             |

**Step 9** Click **View Report**. On the displayed page, you can select a time range and region to view the estimated cost savings, changes, summary, and breakdown.



You can perform the following operations on the report preview page:

- **Adjust the time range and region** to estimate cost savings tailored to your preferences.
- **Adjust discounts** based on the information obtained from the representative office. The system will then calculate the estimated costs for running on Huawei Cloud with these discounts applied.
- **Modify the analysis task settings** to obtain more accurate cost estimates

**Step 10** Download the report directly to your PC or save it to the report list.

- Click **Download** to download the report to your local PC.
- Click **Save** to add the report in the report list. You can then click the report name to view and **edit the report** online.

| Report Name | Generated             | vCPUs | On-Prem Cost (\$/Year) | Huawei Cloud Cost (\$/Year) | Operation |
|-------------|-----------------------|-------|------------------------|-----------------------------|-----------|
| [Redacted]  | Jan 23, 2025 17:04:24 | 1000  | [Redacted]             | [Redacted]                  | Delete    |
| [Redacted]  | Jan 23, 2025 10:10:58 | 1000  | [Redacted]             | [Redacted]                  | Delete    |
| [Redacted]  | Jan 23, 2025 10:10:59 | 1000  | [Redacted]             | [Redacted]                  | Delete    |

Total Records: 3

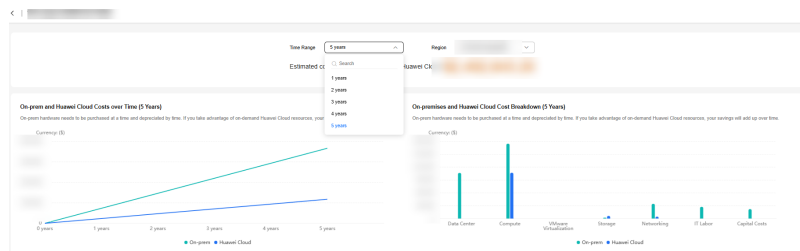
----End

## Adjusting the Time Range and Region

When you preview the TCO analysis report, you can adjust the time range and region to review the estimated cost savings across different periods and regions and see where the costs are saved.

In the list of TCO analysis reports for on-premises to cloud migration, click the report name to view the report details. On the report details page, adjust the time range and region.

**Figure 1-6** Adjusting the time range and region

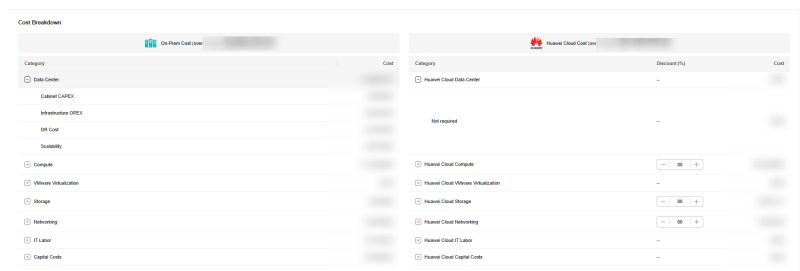


## Adjusting the Discount Assumptions

You can specify the discounts for different Huawei Cloud products provided by the commercial representative to generate more accurate cost estimates.

In the list of TCO analysis reports for on-premises to cloud migration, click the report name to view the details. In the **Cost Breakdown** area, you can apply the discounts.

**Figure 1-7** Cost breakdown

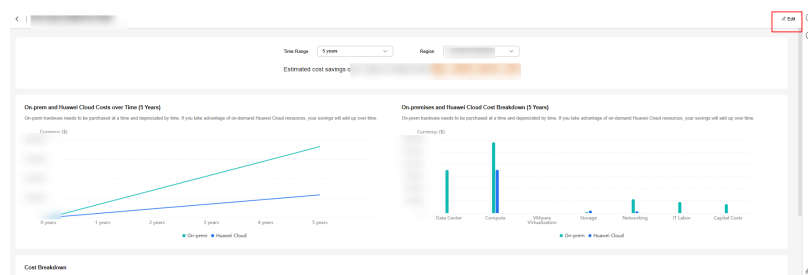


## Adjusting the TCO Analysis Task Settings

You can adjust the TCO analysis task settings to generate a new report.

In the list of TCO analysis reports for on-premises to cloud migration, click the report name to view the report details. In the upper right corner, click **Edit**.

**Figure 1-8** Adjust TCO analysis task settings

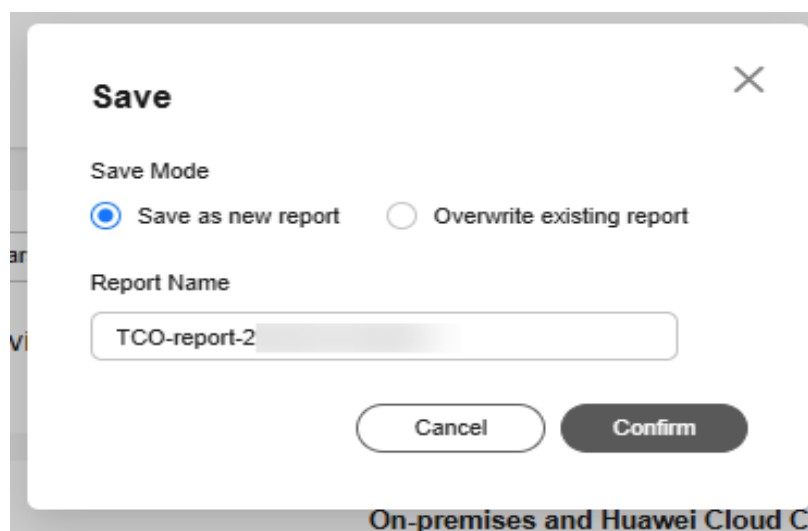


## Editing a Report

**Step 1** In the report list, click a report name. Then view and edit the report online.

**Step 2** Click **Save** and select a save mode.

- If you select **Save as new report**, change the report name and click **OK**. The new report will be added to the list.
- If you select **Overwrite existing report**, click **OK**. The existing report in the list will be updated to include the modifications you made.



----End

### 1.3.2 Credential-based TCO Analysis for Cross-Cloud Migration

You can share your source cloud credentials, and MgC will analyze your source bills, identify what and how many source resources you used, match the source resources with Huawei Cloud alternatives, and then compare the costs of your source environment with the costs on Huawei Cloud.

The supported source clouds include **AWS** and **Alibaba Cloud**.

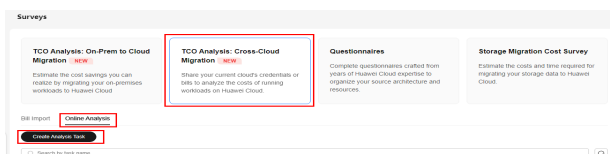
#### NOTICE

A maximum of 9,999 servers can be included in an analysis task.

## Creating an Analysis Task

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, choose a **project** from the drop-down list.
- Step 2** In the navigation pane, choose **Assess > Surveys**.
- Step 3** Click the **TCO Analysis: Cross-Cloud Migration** card. Under the **Online Analysis** tab, click **Create Analysis Task**. If you are using this function for the first time, you need to delegate MgC certain permissions. After you agree to the authorization, the **Create Analysis Task** page is displayed on the right.

**Figure 1-9** Creating a TCO analysis task



- Step 4** Configure the parameters listed in **Table 1-7**.

**Create Analysis Task**

**Task**

Task Name

**Source**

Vendor

Region

Research Method

Credentials

Time Range

Products

**Table 1-7** Parameters required for creating an analysis task

| Parameter | Description                                                                                       |
|-----------|---------------------------------------------------------------------------------------------------|
| Task Name | Enter a task name.                                                                                |
| Vendor    | Select the source cloud vendor.<br><b>NOTE</b><br>Currently, AWS and Alibaba Cloud can be chosen. |
| Region    | Select the region where your source resources are located.                                        |



| Parameter       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Research Method | <ul style="list-style-type: none"> <li>If you select <b>AK/SK</b>, specify <b>Credential</b>, <b>Time Range</b>, and <b>Products</b>. If your source cloud credential has not been added to MgC, <b>add it</b> by choosing <b>Create</b> from the credential drop-down list. Configure the parameters for adding a credential and click <b>Verify and Save</b>.</li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>You need to provide the AK/SK pair of your source cloud account.</li> <li>The source account must have read-only permissions.</li> <li>Fees for API requests may be incurred.</li> </ul> <ul style="list-style-type: none"> <li>If you select <b>Form upload</b>, download the template, fill it out, and upload the file.</li> </ul> <p><b>NOTICE</b></p> <p>A maximum of 9,999 servers can be contained in the file.</p> |
| Target Region   | Select the region you want to migrate to.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**Step 5** Click **Confirm**.

After the task is submitted, it will appear in analysis task list. You can click the task name to view the analysis progress. After the task is finished, you can [download bills](#), [view product mappings](#), and [obtain analysis results](#) for further review.

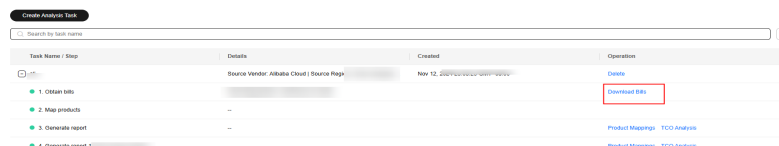
----End

## Downloading Bills

MgC analyzes your source bills for the specified period, identifies the billing items, and obtains the specifications, monthly usage, and monthly consumption of each product you used. You can download your bills after the analysis is finished.

**Step 1** In the analysis task list, click the task name.

**Step 2** Click **Download Bills** in the **Operation** column. The bills will be downloaded to an Excel file.



----End

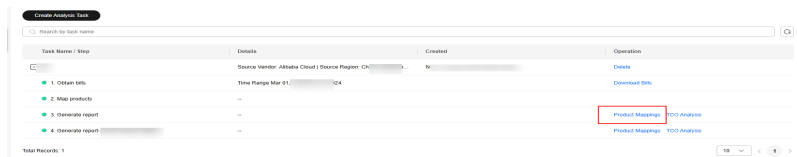
## Viewing Product Mappings

MgC automatically recommends Huawei Cloud alternatives based on the specifications and usage of source resources. The recommendations prioritize cost-effectiveness while maintaining the current specifications.

You can view the product mapping details and adjust the mappings as needed.

**Step 1** In the analysis task list, click the task name.

**Step 2** Click **Product Mappings** in the **Operation** column.



**Step 3** Click  on the left of a resource category to view the mapping details.

 **NOTE**

- Mapping refers to the aligning of source products to target products.
- Standard mapping means a source product is mapped to the equivalent Huawei Cloud product.
- Non-standard mapping means a source product is mapped to a Huawei Cloud product that is closest to the source product. You can change the mapping if needed.

----End

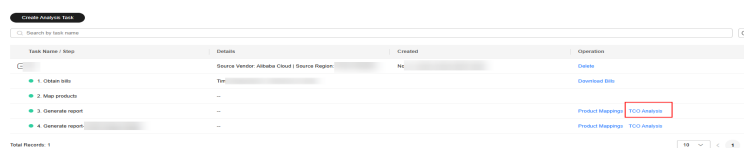
## Viewing Analysis Results

You can view how much you would save if you migrate to Huawei Cloud.

You can also compare the average monthly costs of a certain type of resource between the source cloud vendor and Huawei Cloud. In addition, you can get discounts for each type of resource from your sales manager to save more money on Huawei Cloud.

**Step 1** In the analysis task list, click the task name.

**Step 2** Click **TCO Analysis** in the **Operation** column.



**Step 3** View **Analysis Details** and **Price Differences**, and adjust the estimated costs of Huawei Cloud resources based on the discounts you get.

Click **Export Report** in the upper right corner. The analysis report will be exported to a PDF file.

----End

## 1.3.3 Bill-based TCO Analysis for Cross-Cloud Migration

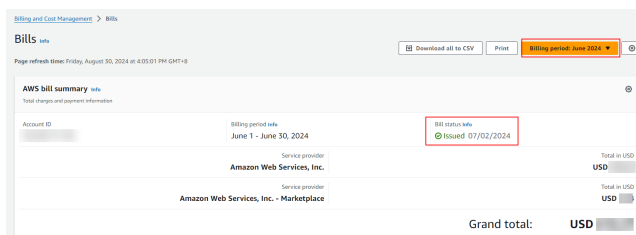
You can upload your source bills to MgC, and it will analyze the bills, identify what and how many source resources you used, match the source resources with Huawei Cloud alternatives, and then compare the cost of your source environment with the cost on Huawei Cloud.

## Notes and Constraints

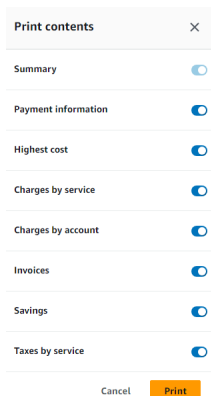
- The supported source cloud is AWS.
- The system can map 17 AWS products such as EC2, RDS, and S3 to Huawei Cloud alternatives. Any products not supported will be excluded from the analysis.
  - Amazon EC2 (Compute)
  - Amazon EC2 (EBS)
  - Amazon EC2 (NAT Gateway)
  - Amazon RDS (MySQL)
  - Amazon RDS (Aurora MySQL)
  - Amazon EKS (Fargate)
  - Amazon ECS (Fargate)
  - Amazon Data Transfer
  - Amazon VPC (VPN)
  - Amazon VPC (VPCEP)
  - Amazon ElastiCache
  - Amazon DocumentDB
  - Amazon ELB
  - Amazon S3
  - Amazon DynamoDB
  - Amazon CloudWatch
  - Amazon ECR
- A maximum of 100 analysis tasks can be created in each MgC migration project, and the task names must be unique.
- The bill file to be uploaded must meet the following requirements:
  - The file must be a PDF file in English or Portuguese. Image PDF files are not supported.
  - The file size cannot exceed 50 MB.
  - The file name cannot contain spaces.

## Preparations

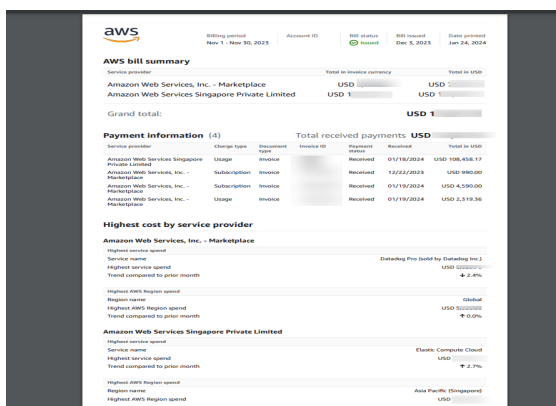
- **Create a migration project.**  
On the MgC console, create a migration project. For details, see [Managing Migration Projects](#).
- **Download AWS bills.**
  - a. Open the [AWS Billing and Cost Management console](#).
  - b. On the **Bills** page, select the month for **Billing period**. Under the AWS bill summary section, confirm that the **Bill status** appears as **Issued**.



- c. Click **Print** in the upper right corner of the page, select the content to be printed, and click **Print**. **Highest cost** and **Charges by service** are mandatory.



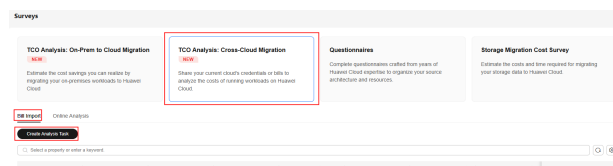
- d. In the displayed dialog box, select **Save as PDF** and click **Save**.



## Creating an Analysis Task

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, choose a **project** from the drop-down list.
- Step 2** In the navigation pane, choose **Assess > Surveys**.
- Step 3** Click the **TCO Analysis: Cross-Cloud Migration** card. Under the **Bill Import** tab, click **Create Analysis Task**. If you are using this function for the first time, you need to delegate MgC certain permissions. After you agree to the authorization, the **Create Analysis Task** page is displayed on the right.

**Figure 1-10** Creating a bill-based analysis task



- Step 4** Enter a task name, select the region you want to migrate to, and click **Select File** to upload the exported bill file to MgC.

**Create Analysis Task** [X]

Vendor  
AWS

Export your AWS bills in English or Portuguese as a PDF file, and ensure the "Charges By Service" option is selected. Then upload the file here.

The system can map 25 AWS products such as EC2/RDS/S3 to Huawei Cloud alternatives. Any products not supported will be excluded from the analysis.

Task Name  
Enter a task name

Target Region  
Select

Target Billing Mode  
Pay-per-use Monthly Yearly

Pay based on the resources used and the duration of usage.

Bill File  
Select File

Max. file size: 50 MB; Supported format: PDF. The file name cannot contain spaces.

The uploaded bill file will be automatically deleted after the task is completed. Deleting the analysis task will also delete the analysis results.

Cancel Confirm

**Step 5** Click **Confirm**. After the task is submitted, you can view the task status, the total source costs, and the total Huawei Cloud costs.

When the task status changes to **Completed**, you can perform the following operations:

- **View product mappings.** You can view what and how many source products you used, whether there are Huawei Cloud alternatives, and what are the alternatives.
- **Modifying product mappings:** You can manually modify the product mappings.
- **Configuring discount assumptions** to adjust the prices of Huawei Cloud alternatives and further optimize the costs on Huawei Cloud.
- **Export the cost analysis results** to your local PC for further review and analysis.

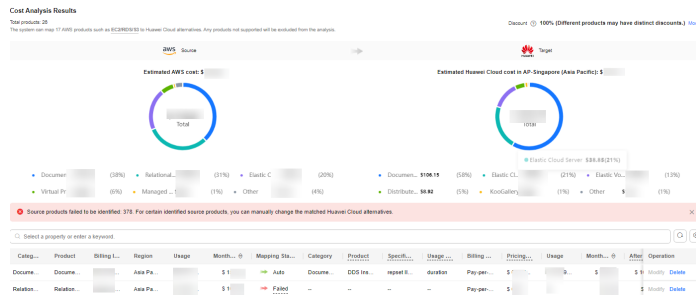
----End

## Viewing Product Mappings

After the cost analysis task is complete, you can view the types and quantities of all products identified from the source bills, whether there are Huawei Cloud alternatives, and what are the alternatives.

In the task list under **Bill Import**, click the task name. On the task details page, view the product mapping details.

**Figure 1-11** Viewing product mappings



## Modifying Product Mappings

Regardless of whether the system finds target products that match source products, you can manually configure target resource configurations, such as the type, specifications, and usage. This helps more accurately estimate the monthly cost of running workloads on the target platform.

- Step 1** In the task list under **Bill Import**, click the task name.
- Step 2** In the product mapping list, click **Modify** in the **Operation** column.

**Figure 1-12** Modifying product mappings

- Step 3** In the **Target Product Summary** area, select the category, product, and specifications as required. The system will recalculate the monthly cost based on your modification.

After confirming your modifications, click **Save**.

**Figure 1-13** Modifying target resource configurations

----End

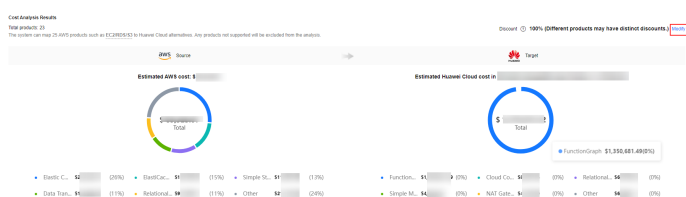
## Configuring Discount Assumptions

You can configure discount assumptions for individual Huawei Cloud products to save more money. For more detailed information on available discounts, you can contact the Huawei Cloud commercial representative.

**Step 1** In the task list under **Bill Import**, click the task name.

**Step 2** In the upper right corner of the page, click **Modify** next to **Discount**.

**Figure 1-14** Modifying discount assumptions



**Step 3** Adjust the discount of each product based on the actual discount obtained from the Huawei Cloud commercial representative. You can configure the following two parameters to modify the discount for all products in a batch or one by one.

- **Discount for All:** This option is used to configure a discount for all products in a batch. You can then adjust the discount individually for each product as needed.
- **Product Discounts:** You can configure a discount for each product separately. Your settings will not change **Discount for All**. Individual product discounts are factored in the cost calculations.

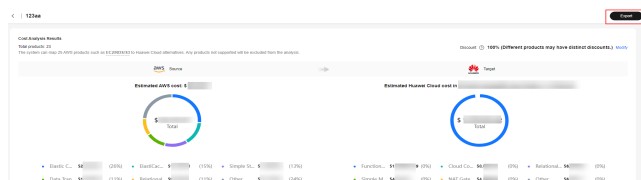
**Step 4** After setting the discounts for all products, click **Save**. Then the system calculates the cost of running on Huawei Cloud based on the discounts you set.

----End

## Exporting Cost Analysis Results

After the analysis task is complete, you can download the analysis results to your local PC for manual adjustment and analysis.

- **Method 1:** In the bill import task list, locate the task and click **Export** in the **Operation** column. The analysis results will then be downloaded to an Excel file.
- **Method 2:** On the task details page, click **Export** in the upper right corner of the page. Then the analysis results will be downloaded as an Excel file.



## 1.3.4 Questionnaires

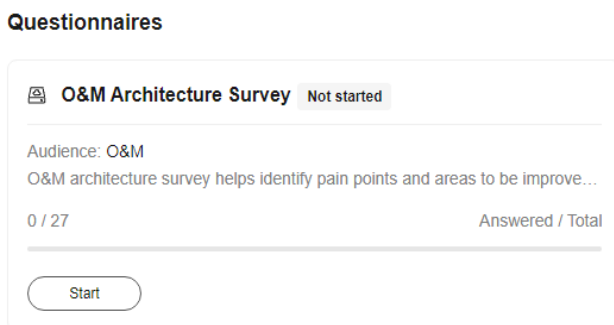
### Overview

By completing the questionnaires crafted from years of Huawei Cloud expertise, you can organize your source architecture and resources.

### O&M Architecture Survey

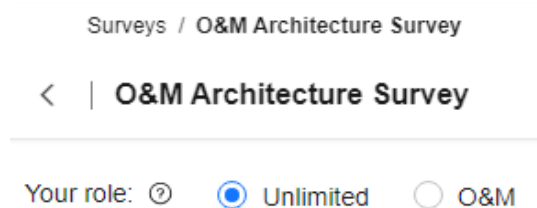
- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, choose a **project** from the drop-down list.
- Step 2** In the navigation pane, choose **Assess > Surveys**.
- Step 3** Select the **Questionnaires** box. In the **O&M Architecture Survey** area, click **Start**.

**Figure 1-15** Starting a survey



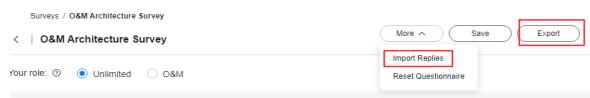
- Step 4** Select your role. Your role determines what questions you will be asked.

**Figure 1-16** Selecting a role



- Step 5** Answer all questions in the questionnaire in sequence. You can refer to the answer example on the right of the page. If you have any questions or need suggestions from the professional team, click **Export** in the upper right corner of the page to export the questionnaire. Consult the team, input their suggestions, and import the questionnaire back.

**Figure 1-17** Exporting and importing a questionnaire





**Step 6** After confirming the answers to all questions, click **Save** in the upper right corner of the page.

----End

## 1.3.5 Storage Migration Cost Survey

You can estimate the costs and time required to migrate your storage data to Huawei Cloud based on the size and number of files to be migrated. MgC will calculate the necessary migration cluster size and network bandwidth. This allows you to choose a migration solution that fits your needs and budget.

### Procedure

**Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, choose a **project** from the drop-down list.

**Step 2** In the navigation pane, choose **Assess > Surveys**.

**Step 3** Click the **Storage Migration Cost Survey** box.

**Step 4** In the **Source** area, select the source platform and source type, and enter the number of source files and total file size.

**Step 5** In the **Target** area, select the target region and storage type.

**Step 6** In the **Advanced Settings** area, select a network type, set preferences, and enter the desired migration time.

**Step 7** Click **Estimate**. The system will provide different migration solutions based on the settings.

----End

## 1.4 Resource Discovery

### 1.4.1 Online Discovery

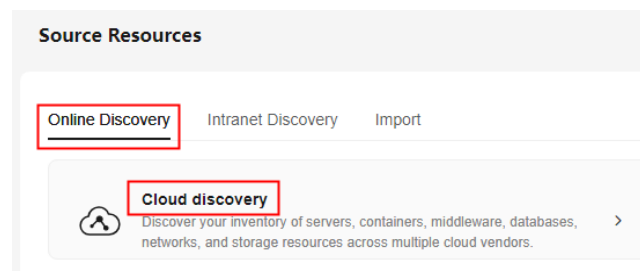
Before migrating, you need to discover your resources and collect their details. This section describes how to discover resources provisioned on cloud platforms such as Alibaba Cloud, Huawei Cloud, AWS, Tencent Cloud, Google Cloud, Azure, Qiniu Cloud, and Kingsoft Cloud over the Internet. Then you can organize the associations between resources and applications. The resource types supported by MgC depend on the source cloud platform.

- Alibaba Cloud and Huawei Cloud: servers, containers, middleware, databases, networks, and storage
- Tencent Cloud: servers, databases, and storage
- AWS, Google Cloud, and Azure: servers, containers, middleware, databases, storage, and networks
- Qiniu Cloud and Kingsoft Cloud: object storage

## Creating an Online Discovery Task

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select an **application migration project** from the drop-down list.
- Step 2** In the navigation pane, choose **Discover > Source Resources**.
- Step 3** Under **Online Discovery**, click **Cloud Discovery**.

**Figure 1-18** Cloud platform discovery



- Step 4** Configure the parameters listed in **Table 1-8** to create a discovery task.

**Table 1-8** Parameters for creating a cloud discovery task

| Area           | Parameter        | Description                                                                                                                                                       | Mandatory |
|----------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Basic Settings | Task Name        | Specify a name for the task.                                                                                                                                      | Yes       |
|                | Task Description | Describe the task.                                                                                                                                                | No        |
| Task Settings  | Source Platform  | Select the source cloud platform. Currently, Alibaba Cloud, Huawei Cloud, AWS, Tencent Cloud, Google Cloud, Azure, Qiniu Cloud, and Kingsoft Cloud are supported. | Yes       |

| Area | Parameter     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Mandatory |
|------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|      | Credential    | <p>Select the credential for accessing the source cloud platform. If no credential is available, choose <b>Create</b> to add one. For details, see <a href="#">Managing Credentials</a>.</p> <ul style="list-style-type: none"> <li>• If the source cloud platform is Alibaba Cloud, Huawei Cloud, AWS, Tencent Cloud, Qiniu Cloud, or Kingsoft Cloud, select <b>AK/SK</b> for <b>Authentication</b> and enter the AK/SK pair of your source cloud account.</li> <li>• If the source cloud platform is Google Cloud, select <b>Configuration File</b> for <b>Authentication</b> and upload the configuration file that contains your Google Cloud service account credentials. The file must be in JSON format and cannot exceed 4 KB.</li> <li>• If the source cloud platform is Azure, Select <b>ID/Secret</b> for <b>Authentication</b>. To learn how to obtain Azure credentials, see <a href="#">How Do I Obtain Azure Credentials?</a></li> </ul> | Yes       |
|      | Region        | Select the region where your source environment is located. Multiple regions can be selected.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Yes       |
|      | Resource Type | Choose the types of source resources (collection items) to be collected from the drop-down list. For resource types supported for each cloud platform, see <a href="#">Table 1-9</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Yes       |

| Area | Parameter   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Mandatory |
|------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|      | Application | <p>Select the application that you want to group the discovered resources into. If no applications are available, perform the following steps to create one:</p> <ol style="list-style-type: none"> <li>1. Click <b>Create Application</b>, enter an application name and description, select a business scenario and running environment, and select the region where the application resources will be deployed on the target cloud.</li> <li>2. Click <b>OK</b>.</li> </ol> | No        |

**Table 1-9** Supported resource types

| Cloud Platform | Resource Type                                                                                                                       | Subtype                                                                                                                                                                                                                                                                                                                                         |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alibaba Cloud  | <ul style="list-style-type: none"> <li>• Servers</li> <li>• Containers</li> <li>• Big data clusters</li> <li>• Databases</li> </ul> | -                                                                                                                                                                                                                                                                                                                                               |
|                | Middleware                                                                                                                          | <ul style="list-style-type: none"> <li>• Redis</li> <li>• Kafka</li> </ul>                                                                                                                                                                                                                                                                      |
|                | Storage                                                                                                                             | <ul style="list-style-type: none"> <li>• Object storage</li> <li>• File storage</li> </ul>                                                                                                                                                                                                                                                      |
|                | Networks                                                                                                                            | <ul style="list-style-type: none"> <li>• Cloud connections</li> <li>• Load balancers (ALB and CLB)</li> <li>• Private lines</li> <li>• Public domain names</li> <li>• Private domain names</li> <li>• EIPs</li> <li>• Public NAT gateways</li> <li>• Route tables</li> <li>• Security groups</li> <li>• VPCs</li> <li>• VPN gateways</li> </ul> |

| Cloud Platform | Resource Type                                                                                                                       | Subtype                                                                                                                                                                                                                                                                                                  |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Huawei Cloud   | <ul style="list-style-type: none"> <li>• Servers</li> <li>• Containers</li> <li>• Big data clusters</li> <li>• Databases</li> </ul> | -                                                                                                                                                                                                                                                                                                        |
|                | Middleware                                                                                                                          | <ul style="list-style-type: none"> <li>• Redis</li> <li>• Kafka</li> </ul>                                                                                                                                                                                                                               |
|                | Storage                                                                                                                             | <ul style="list-style-type: none"> <li>• Object storage</li> <li>• File storage</li> </ul>                                                                                                                                                                                                               |
|                | Networks                                                                                                                            | <ul style="list-style-type: none"> <li>• Load balancers (ELB)</li> <li>• Public domain names</li> <li>• Private domain names</li> <li>• EIPs</li> <li>• Public NAT gateways</li> <li>• Route tables</li> <li>• Security groups</li> <li>• VPCs</li> </ul>                                                |
| AWS            | <ul style="list-style-type: none"> <li>• Servers</li> <li>• Containers</li> <li>• Databases</li> </ul>                              | -                                                                                                                                                                                                                                                                                                        |
|                | Middleware                                                                                                                          | <ul style="list-style-type: none"> <li>• Redis</li> <li>• Kafka</li> </ul>                                                                                                                                                                                                                               |
|                | Networks                                                                                                                            | <ul style="list-style-type: none"> <li>• Load balancers (ELB) (Currently, only CLB balancers are supported.)</li> <li>• Public domain names</li> <li>• Private domain names</li> <li>• EIPs</li> <li>• Public NAT gateways</li> <li>• Route tables</li> <li>• Security groups</li> <li>• VPCs</li> </ul> |
|                | Storage                                                                                                                             | <ul style="list-style-type: none"> <li>• Object storage</li> <li>• File storage</li> </ul>                                                                                                                                                                                                               |
| Tencent Cloud  | <ul style="list-style-type: none"> <li>• Servers</li> <li>• Databases</li> </ul>                                                    | -                                                                                                                                                                                                                                                                                                        |

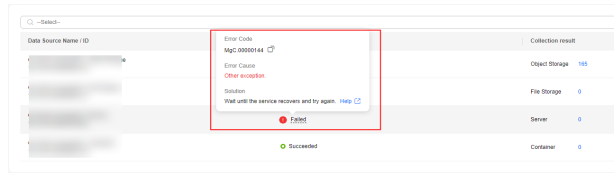
| Cloud Platform | Resource Type                                                                                    | Subtype                                                                                                                                                                  |
|----------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Storage                                                                                          | <ul style="list-style-type: none"> <li>Object storage</li> <li>File storage</li> </ul>                                                                                   |
| Google Cloud   | <ul style="list-style-type: none"> <li>Servers</li> <li>Containers</li> <li>Databases</li> </ul> | -                                                                                                                                                                        |
|                | Middleware                                                                                       | Redis                                                                                                                                                                    |
|                | Storage                                                                                          | <ul style="list-style-type: none"> <li>Object storage</li> <li>File storage</li> </ul>                                                                                   |
|                | Networks                                                                                         | <ul style="list-style-type: none"> <li>EIPs</li> <li>Route tables</li> <li>Security groups</li> <li>VPCs</li> </ul>                                                      |
| Azure          | <ul style="list-style-type: none"> <li>Servers</li> <li>Containers</li> <li>Databases</li> </ul> | -                                                                                                                                                                        |
|                | Storage                                                                                          | <ul style="list-style-type: none"> <li>Object storage</li> <li>File storage</li> </ul>                                                                                   |
|                | Middleware                                                                                       | <ul style="list-style-type: none"> <li>Redis</li> <li>Kafka</li> </ul>                                                                                                   |
|                | Networks                                                                                         | <ul style="list-style-type: none"> <li>EIPs</li> <li>Route tables</li> <li>Security groups</li> <li>Public NAT gateways</li> <li>VPCs</li> <li>Load balancers</li> </ul> |
| Qiniu Cloud    | Storage                                                                                          | Object storage                                                                                                                                                           |
| Kingsoft Cloud | Storage                                                                                          | Object storage                                                                                                                                                           |

**Step 5** Click **Confirm**. After the Internet-based discovery task is created, MgC starts discovering source resources.

- If the task succeeds, return to the **Source Resources** page and [view the list of discovered source resources and resource details](#).

- If the task fails, click the task name to view the data source that fails to be collected. Move the cursor to the collection status of the data source to view the failure cause.

**Figure 1-19** Viewing the failure cause



**Step 6** Wait until the task status changes to **Succeeded**. Then perform subsequent operations for different types of resources.

- For discovered servers, **perform a deep collection** or **check their migration readiness** and then design a **migration solution** or **migration plan**.
- For discovered containers, **perform a deep collection** and **design a migration solution**.
- For discovered middleware, databases, and storage resources, **design migration solutions**. **Deep collection** is available for AWS RDS (for MySQL, MariaDB, Aurora, PostgreSQL, SQL Server, and Oracle) and AWS DocumentDB databases.
- For discovered object storage resources, **perform a deep collection** and **configure a migration plan**.

----End

## Check Migration Readiness for Servers

Perform the following steps to check whether your source servers meet the migration requirements:

1. **Install the MgC Agent** in the source intranet environment and connect the MgC Agent to MgC.
2. Go to the **Source Resources** page, in the server list, select the servers to be migrated and click **Group as Application** above the list. If you have specified an application in the Internet-based discovery task for discovering these source servers, skip this step.
  - If you have created an application, select the application from the drop-down list and click **OK**.
  - If you have not created an application, click **Create Application** in the displayed dialog box. Then enter an application name and description, select a business scenario, environment, and target region, and click **Create**. Then click **OK**.
3. On the top of the server list, choose **Migration Scenario > Server migration**.
4. For each source server, click **Configure** in the **Migration Readiness** column.
5. Configure the parameters listed in **Table 1-10**.

**Table 1-10** Parameters for configuring migration readiness

| Parameter         | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type              | Set this parameter based on the source server OS type.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| MgC Agent         | Select the MgC Agent installed in the source environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Access IP Address | Select the IP address for accessing the source server. It can be a public or private IP address. After the pre-migration check is passed, the IP address you select here will be used for migration.                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Port              | Enter the port on the source server that allows access from the MgC Agent. <ul style="list-style-type: none"><li>• By default, port 5985 on Windows source servers must be opened to the MgC Agent. The port cannot be changed.</li><li>• By default, port 22 on Linux source servers must be opened to the MgC Agent. You can specify a different port if needed.</li></ul>                                                                                                                                                                                                                                                                   |
| Credential        | Select the server credential. If the credential has not been added to MgC, go to the MgC Agent console, <a href="#">add the server credential</a> to the MgC Agent, and synchronize it to MgC.<br><b>NOTICE</b><br>The account provided in the credential must have sufficient permissions, so the MgC Agent can collect necessary server details. To perform a deep collection for the server to collect as much as details, the credential you provided must meet the following requirements: <ul style="list-style-type: none"><li>• Linux: <b>root</b> and its password</li><li>• Windows: <b>administrator</b> and its password</li></ul> |

6. Click **Confirm**. The system checks whether the source server can be accessed using the information you provided and whether the server can be migrated. If **Ready** shows up in the **Migration Readiness** column, the source server can be migrated. Then you can [design a migration solution](#) or [design a migration plan](#) to migrate the server.

## Performing a Deep Collection for Servers

Perform the following steps to perform a deep collection for your source servers:

1. Ensure that [the MgC Agent](#) has been installed in the source intranet environment and has been connected to MgC.
2. On the **Source Resources** page, in the server list, locate the source server whose details you want to collect and click **Configure** in the **MgC Agent** column. Configure the parameters listed in [Table 1-11](#).



**Table 1-11** Parameters for configuring a deep collection

| Parameter         | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type              | Set this parameter based on the source server OS type.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| MgC Agent         | Select the MgC Agent installed in the source environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Access IP Address | Select the IP address for accessing the source server. It can be a public or private IP address. After the pre-migration check is passed, the IP address you select here will be used for migration.                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Port              | Enter the port on the source server that allows access from the MgC Agent. <ul style="list-style-type: none"><li>• By default, port 5985 on Windows source servers must be opened to the MgC Agent. The port cannot be changed.</li><li>• By default, port 22 on Linux source servers must be opened to the MgC Agent. You can specify a different port if needed.</li></ul>                                                                                                                                                                                                                                                          |
| Credential        | Select the server credential. If the credential has not been added to MgC, go to the MgC Agent console, <b>add the server credential</b> to the MgC Agent, and synchronize it to MgC.<br><b>NOTICE</b><br>The account provided in the credential must have sufficient permissions, so the MgC Agent can collect necessary server details. To perform a deep collection for the server to collect as much as details, the credential you provided must meet the following requirements: <ul style="list-style-type: none"><li>• Linux: <b>root</b> and its password</li><li>• Windows: <b>administrator</b> and its password</li></ul> |

3. Click **Confirm**. Then the system automatically starts executing a deep collection. When **Collected** shows up in the **Deep Collection** column, the collection is complete. You can **design a migration solution** or **design a migration plan** to migrate your servers.

## Performing a Deep Collection for Containers

Perform the following steps to perform a deep collection for your containers:

1. Ensure that **the MgC Agent** has been installed in the source intranet environment and has been connected to MgC.
2. On the **Source Resources** page, click the **Containers** tab.
3. For each container resource whose details need to be collected, click **Associate** in the **MgC Agent** column.

If you want to associate multiple resources with an MgC agent at a time, select them and click **Manage MgC Agent** above the list.

4. Select the MgC Agent you installed in the source environment and click **OK**. Wait until **Associated** appears in the **MgC Agent** column.
5. For each container resource, in the **Credential** column, click **Associate** to configure their credentials.
6. Select the resource credential. If the credential is not displayed in the list, go to the MgC Agent console, [add the credential](#) to the MgC Agent, and synchronize it to MgC.
7. Click **OK**. Then MgC checks whether the resource can be accessed using the associated credential. When **Ready** appears in the **Deep Collection** column, click **Collect** to perform a deep collection. You can click **Collect Again** in the **Deep Collection** column to launch a deep collection again if needed. After the collection is complete, click the resource name to view the collected details.

## Performing a Deep Collection for Object Storage Resources

Follow the steps below to perform a deep collection for your object storage resources, so the system can use the collected details to recommend rightsized migration clusters.

1. Ensure that [the MgC Agent](#) has been installed in the source intranet environment and has been connected to MgC.
2. On the **Source Resources** page, click the **Storage** tab.
3. Locate an object storage resource and click **Configure** in the **Deep Collection** column.
4. Select the MgC Agent in the source environment and the credential for accessing the resource, and click **Confirm**. If the credential is not displayed in the drop-down list, go to the MgC Agent console and [add the resource credential](#) to the MgC Agent and synchronize it to MgC.

### NOTICE

To perform a deep collection for your Azure object storage resources, you need to provide your storage account and access key. For details about how to obtain the credentials, see [How Do I Obtain the Required Credentials Before Using MgC to Perform a Deep Collection for My Azure Object Storage Resources?](#)

5. Click **Add Prefix** in the **Operation** column.
6. Enter a prefix to filter the objects whose details need to be collected. If this parameter is not specified, all objects in the bucket are collected by default. Click **OK** to save the prefix settings.
7. Click **Deep Collection** in the **Operation** column. The system starts collecting path details. You can perform a deep collection on a resource for multiple times. When **Collection Status** changes to **Completed**, click the resource name to view the collected information.

## Performing a Deep Collection for Databases

Deep collection is available for AWS RDS (for MySQL, MariaDB, Aurora, PostgreSQL, SQL Server, and Oracle) and AWS DocumentDB databases. The data

collected includes database version, engine, server character set, average transactions per second (TPS), and queries per second (QPS), and other key performance metrics (KPIs). The collected data depends on the database type.

1. Ensure that **the MgC Agent** has been installed in the source intranet environment, can access source databases, and has been registered with MgC.
2. On the **Source Resources** page, click the **Databases** tab.
3. In the database list, filter all discovered AWS databases by applying the **Vendor** filter. Locate a supported database and in the **MgC Agent** column, click **Associate**.

If you want to associate multiple resources with an MgC agent at a time, select them and click **Manage MgC Agent** above the list.

4. Select your MgC Agent. For **Access Setting**, if the selected resource is in the same VPC as your MgC Agent, select **Private access**. Otherwise, select **Public access**. Then click **OK**. Wait until **Associated** appears in the **MgC Agent** column.
5. In the **Credential** column, click **Associate** to associate the credential for accessing the resource.
6. Select the resource credential. If the credential is not displayed in the list, go to the MgC Agent console, **add the credential** to the MgC Agent, and synchronize it to MgC.
7. Click **OK**. Then MgC checks whether the resource can be accessed using the associated credential. When **Ready** appears in the **Deep Collection** column, click **Collect** to perform a deep collection. You can click **Collect Again** in the **Deep Collection** column to perform a deep collection again if needed.
8. Wait for the deep collection to complete. Then click the database name to go to the database details page. In the **Database Information** area, you can view the collected details.

## Viewing Discovered Source Resources

A discovery task can collect only basic information about source resources. More detailed information needs to be collected through a deep collection.

1. On the **Source Resources** page, you can view the list and number of discovered resources.
2. Click each tab to view the list of resources for that category.
3. Click a resource name to view its details.

## 1.4.2 Intranet Discovery

MgC enables you to discover resources running in on-premises IDCs and vCenters. Before getting started, you need to install the MgC Agent in the source intranet.

### Notes and Constraints

- Only VMs in VMware vSphere 5.0 to 7.0 can be discovered.
- When the system scans for VMware VMs or scans for servers on specific network ranges, it uses the servers' private IP addresses and the ID of the used MgC Agent to identify discovered servers. If a server's private IP address changes after the server is discovered, the server will be identified as a new

one during the next discovery, and the total number of discovered servers will increase. To avoid this, do not change private IP addresses for source servers before the migration is complete.

- Performance data of VMware VMs within a specified period can be collected during the automatic scan. For discovered VMs, a separate performance collection is not necessary.
- The performance data collected during the VMware VM scanning comes from the historical data stored in the vCenter. The default data retention policy in the vCenter is as follows:
  - One day: Data points are collected every 5 minutes.
  - One week: Data points are collected every 30 minutes.
  - One month: Data points are collected every two hours.

## Prerequisites

- You have **installed the MgC Agent** in the source intranet environment and have **connected the MgC Agent to MgC**.
- You have **added source server credentials** to the MgC Agent.

### NOTICE

To perform a deep collection for your source servers to collect as much as details, provide server credentials that meet the following requirements:

- Linux: **root** and its password
- Windows: **administrator** and its password

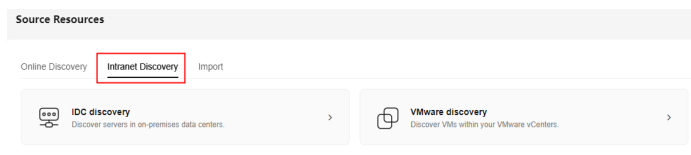
## Creating an IDC Discovery Task

**Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select an **application migration project** from the drop-down list.

**Step 2** In the navigation pane, choose **Discover > Source Resources**.

**Step 3** Click the **Intranet Discovery** tab and select the environment where your source servers run.

**Figure 1-20** Selecting the source environment



**Step 4** To configure an IDC discovery task, set the parameters by referring to **Table 1-12**.

**Table 1-12** Parameters for configuring an IDC discovery task

| Parameter        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Task Name        | Enter a task name.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Task Description | Describe the task.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| MgC Agent        | Select the <b>MgC Agent</b> installed in the source intranet environment.                                                                                                                                                                                                                                                                                                                                                                                          |
| Protocol         | Only TCP is available.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Network Range    | Enter an IP address range which must fall within: <ul style="list-style-type: none"><li>• 10.0.0.0 – 10.255.255.255</li><li>• 172.16.0.0 – 172.31.255.255</li><li>• 192.168.0.0 – 192.168.255.255</li></ul>                                                                                                                                                                                                                                                        |
| Linux            | Enter the port for scanning for Linux servers. If you do not need to scan for Linux servers, set the port number to <b>0</b> .                                                                                                                                                                                                                                                                                                                                     |
| Windows          | Enter the port for scanning Windows servers. If you do not need to scan for Windows servers, set the port number to <b>0</b> .                                                                                                                                                                                                                                                                                                                                     |
| Application      | Select the application that you want to group the discovered servers into. If no applications are available, perform the following steps to create one: <ol style="list-style-type: none"><li>1. Click <b>Create Application</b>, enter an application name and description, select a business scenario and running environment, and select the region where the application resources will be deployed on the target cloud.</li><li>2. Click <b>OK</b>.</li></ol> |

**Step 5** Click **Confirm**. After the IDC discovery task is created, MgC starts discovering source resources.

**Step 6** Wait until the discovery task succeeds, return to the **Source Resources** page and perform a deep collection for the discovered servers.

1. On the **Source Resources** page, in the server list, for each server whose details need to be collected, click **Configure** in the **MgC Agent** column.
2. Configure the parameters listed in **Table 1-13**.

**Table 1-13** Parameters for configuring a deep collection

| Parameter | Configuration                                             |
|-----------|-----------------------------------------------------------|
| Type      | Set this parameter based on the source server OS type.    |
| MgC Agent | Select the MgC Agent installed in the source environment. |

| Parameter         | Configuration                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Access IP Address | Select the IP address for accessing the source server. It can be a public or private IP address. After the pre-migration check is passed, the IP address you select here will be used for migration.                                                                                                                                                                            |
| Port              | Enter the port on the source server that allows access from the MgC Agent. <ul style="list-style-type: none"> <li>- By default, port 5985 on Windows source servers must be opened to the MgC Agent. The port cannot be changed.</li> <li>- By default, port 22 on Linux source servers must be opened to the MgC Agent. You can specify a different port if needed.</li> </ul> |
| Credential        | Select the server credential. If the credential is not displayed in the list, go to the MgC Agent console, <b>add the server credential</b> , and synchronize it to MgC.                                                                                                                                                                                                        |

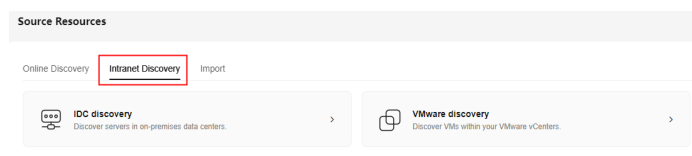
3. Click **Confirm**. Then the system automatically starts executing a deep collection. When **Collected** shows up in the **Deep Collection** column, the collection is complete. You can proceed to **create a migration solution** or **create a migration plan**.

----End

## Creating a VMware Discovery Task

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select an **application migration project** from the drop-down list.
- Step 2** In the navigation pane, choose **Discover > Source Resources**.
- Step 3** Click the **Intranet Discovery** tab and select the environment where your source servers run.

**Figure 1-21** Selecting the source environment



- Step 4** To configure a VMware discovery task, set the parameters by referring to **Table 1-14**.

**Table 1-14** Parameters for configuring a VMware discovery task

| Parameter | Description        |
|-----------|--------------------|
| Task Name | Enter a task name. |

| Parameter        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Task Description | Describe the task.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| MgC Agent        | Select the <b>MgC Agent</b> installed in the source intranet environment.                                                                                                                                                                                                                                                                                                                                                                                             |
| IP Address       | Enter the IP address of the vCenter Server for discovering the managed VMs.                                                                                                                                                                                                                                                                                                                                                                                           |
| Port             | Enter the port for accessing the vCenter Server.                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Credential       | Select the credential for accessing vCenter. If the drop-down list is empty, go to the MgC Agent console and <b>add the credential</b> . Set the resource type to <b>Private cloud</b> and enter the username and password for logging in to the vCenter Server.                                                                                                                                                                                                      |
| Application      | Select the application that you want to group the discovered servers into. If no applications are available, perform the following steps to create one: <ol style="list-style-type: none"> <li>1. Click <b>Create Application</b>, enter an application name and description, select a business scenario and running environment, and select the region where the application resources will be deployed on the target cloud.</li> <li>2. Click <b>OK</b>.</li> </ol> |

**Step 5** Click **Confirm**. After the VMware discovery task is created, MgC starts discovering source resources.

**Step 6** Wait until the discovery task succeeds, return to the **Source Resources** page and perform a deep collection for the discovered servers.

1. On the **Source Resources** page, in the server list, for each server whose details need to be collected, click **Configure** in the **MgC Agent** column.
2. Configure the parameters listed in **Table 1-15**.

**Table 1-15** Parameters for configuring a deep collection

| Parameter         | Configuration                                                                                                                                                                                        |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type              | Set this parameter based on the source server OS type.                                                                                                                                               |
| MgC Agent         | Select the MgC Agent installed in the source environment.                                                                                                                                            |
| Access IP Address | Select the IP address for accessing the source server. It can be a public or private IP address. After the pre-migration check is passed, the IP address you select here will be used for migration. |

| Parameter  | Configuration                                                                                                                                                                                                                                                                                                                                                                |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Port       | Enter the port on the source server that allows access from the MgC Agent. <ul style="list-style-type: none"><li>– By default, port 5985 on Windows source servers must be opened to the MgC Agent. The port cannot be changed.</li><li>– By default, port 22 on Linux source servers must be opened to the MgC Agent. You can specify a different port if needed.</li></ul> |
| Credential | Select the server credential. If the credential is not displayed in the list, go to the MgC Agent console, <a href="#">add the server credential</a> , and synchronize it to MgC.                                                                                                                                                                                            |

3. Click **Confirm**. Then the system automatically starts executing a deep collection. When **Collected** shows up in the **Deep Collection** column, the collection is complete. You can proceed to [create a migration solution](#) or [create a migration plan](#).

----End

## 1.4.3 Importing RVTools Data

### Notes and Constraints

- **Supported RVTools versions**

The supported RVTools versions include:

- 4.4.1
- 4.4.2
- 4.4.3
- 4.4.4
- 4.4.5
- 4.5.0
- 4.5.1
- 4.6.1

- **File format requirements**

Only the Excel (.xlsx) format is supported.

- **File size and compression ratio requirements**

The file to be imported cannot be larger than 100 MB, and the compression ratio cannot be lower than 5%.

### Step 1: Exporting RVTools Data

**Step 1** Start the RVTools application.

**Step 2** On the login page, enter the following information:



- In the **IP address/Name** text box, enter IP address of the vCenter server.
- In the **User name** text box, enter the username for connecting to the vCenter server.
- In the **Password** text box, enter the password corresponding to the username.

**Step 3** Click **Login**. In the top menu bar, choose **File > Export all to Excel**.

**Step 4** Select a path for saving the file that contains details about your resource.

----End

## Step 2: Uploading the Exported File to OBS

**Step 1** Sign in to Huawei Cloud **OBS console** and create a Standard bucket for storing the file exported from RVTools. For details, see [Creating a Bucket](#).

**Step 2** Upload the **file exported from RVTools** to the Standard OBS bucket. For details, see [Uploading an Object](#).

----End

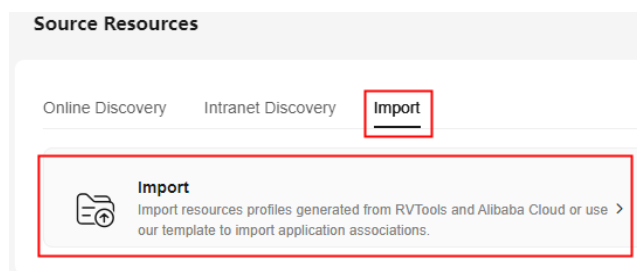
## Step 3: Importing RVTools Data

**Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select an **application migration project** from the drop-down list.

**Step 2** In the navigation pane, choose **Discover > Source Resources**.

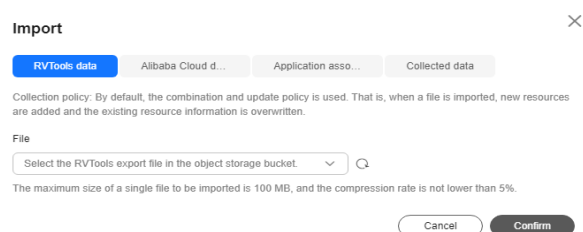
**Step 3** Click the **Import** tab. Then click the **Import** card.

**Figure 1-22** Import



**Step 4** Click the **RVTools data** option. In the **File** drop-down list, locate the OBS bucket you used to store the file exported from RVTools in [step 2](#), select the exported file, and click **Confirm**.

**Figure 1-23** Uploading the file exported from RVTools



**NOTE**

If you are using this function for the first time, click **OK** in the **Authorization Required** dialog box to agree to the agency-based authorization.

- Step 5** After the upload is successful, go to the **Task Center** page and view the task status.
- If the task status is **Succeeded**, you can view the imported **resource details** and **resource statistics**.
  - If the task status is **Failed**, click the task name to view the data source that failed to be collected. You can move the cursor to the collection status to view the failure cause. For details about how to rectify common failure causes, see **What Can I Do If Importing RVTools Data Fails?** After handling the failure cause, import the file again.

----End

## Viewing Resource Details

When the status of the RVTools import task changes to **Succeeded**, go to the **Source Resources** page and view the imported resource information in the server list. You can click a server name to view more basic information and specifications of the server.

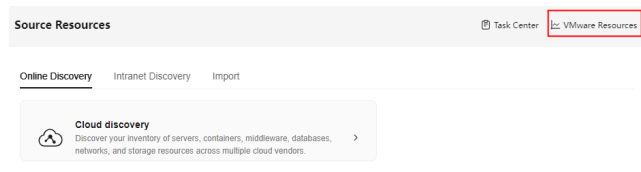
## Viewing Resource Statistics

If the status of the RVTools import task is **Succeeded**, you can view the VMware resource statistics under the corresponding tab.

- **Host:** CPU model, host quantity, total memory, allocated VM memory, memory allocation rate, VM quantity, quantity of running VMs, storage usage, and host list.
- **VMs:** the number of Windows OS versions, number of Linux OS distributions, total memory, total number of vCPU, number of disks, disk capacity, number of VMs, and VM list

- Step 1** On the **Source Resources** page, click **VMware Resources** in the upper right corner.

**Figure 1-24** Viewing VMware resources



- Step 2** On the displayed **Resource Statistics** page, under **VMware Resources**, click the **Host** or **VM** tab to view resource statistics.

----End

## 1.4.4 Importing Details of Alibaba Cloud Resources

You can import CSV-formatted resource details from Alibaba Cloud directly into MgC. You first need to export the resource details from Alibaba Cloud. After the

import is complete, you can view the resource details on the MgC console. With the imported details, you can get recommendations for suitable Huawei Cloud resources.

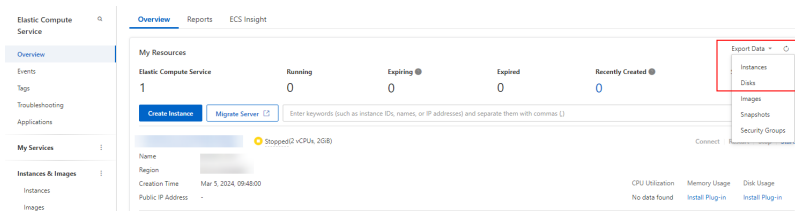
The supported Alibaba Cloud resources are:

- Elastic Compute Service (ECS) instances and cloud disks
- Object Storage Service (OSS) buckets
- ApsaraDB RDS for MySQL instances
- ApsaraDB RDS for GaussDB instances

## Exporting Data of Alibaba Cloud ECS Instances and Disks

**Step 1** Sign in to the Alibaba Cloud ECS console.

**Step 2** On the **Overview** page, choose **Export Data > Instances** to export a list of all ECS instances.



**Step 3** Choose **Export Data > Disks** to export a list of all cloud disks.

**Step 4** Open the instance list and the disk list and adjust the resource information if needed. Ensure that the lists contain the necessary information.


| List          | Mandatory Fields                                          |
|---------------|-----------------------------------------------------------|
| Instance list | Instance ID, OS, instance specifications, CPU, and memory |
| Disk list     | Instance ID, disk ID, capacity (GiB), and disk attributes |

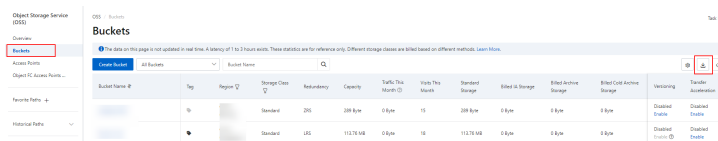
----End

## Exporting Data of Alibaba Cloud OSS Buckets

**Step 1** Sign in to the OSS console.

**Step 2** In the left navigation pane, choose **Buckets**.

**Step 3** Click the  icon in the upper right corner of the list. The **Export Bucket List** dialog box is displayed.



**Step 4** Select the information to be exported and click **OK**.

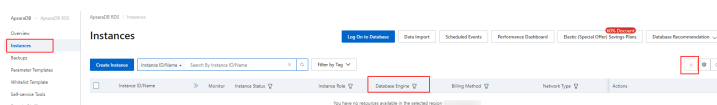
----End

## Exporting Data of Alibaba Cloud ApsaraDB RDS for MySQL Instances

**Step 1** Sign in to the Alibaba Cloud ApsaraDB RDS for MySQL console.

**Step 2** In the navigation pane on the left, choose **Instances**. Select a region in the upper part of the page.

**Step 3** Filter all MySQL instances in the **Database Engine** column and click the icon in the upper right corner of the list.



**Step 4** In the displayed dialog box, select the information to be exported. Click **OK**. The system exports the instance information to a CSV file and automatically downloads the file.

**Step 5** Modify the exported CSV file so MgC can parse the file content.

1. Use a file editor to open the CSV file and search for **PrivatePort(A network port,)** in the table header.
2. Delete the comma (,) from this field and save the file. The correct format is **PrivatePort(A network port)**.

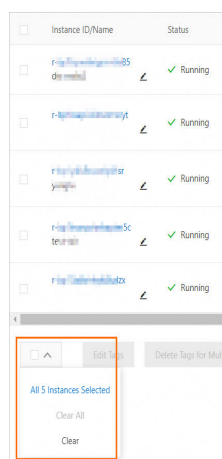
----End


## Exporting Data of Alibaba Cloud ApsaraDB RDS for Redis Instances

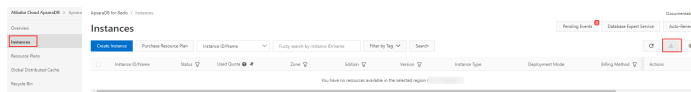
**Step 1** Sign in to the Alibaba Cloud ApsaraDB for Redis console.

**Step 2** In the navigation pane on the left, choose **Instances**. Select a region in the upper part of the page.

**Step 3** In the lower left corner of the page, expand  and click **Select All**.



- Step 4** Click the  icon in the upper right corner of the list. In the dialog box that is displayed, select the information to be exported.



- Step 5** Click **OK**. The system exports the instance information to a CSV file and automatically downloads the file.

- Step 6** Modify the exported CSV file so MgC can parse the file content.

1. Use a file editor to open the CSV file.
2. Add a comma (,) at the end of the table heading line and save the file.

The following shows an example table header before modification:

```
ID,Name,Quantity
```

The following shows the table header after modification:

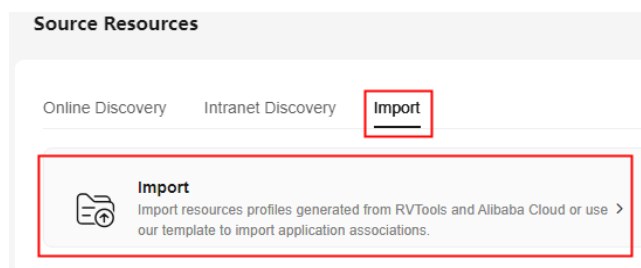
```
ID,Name,Quantity,
```

----End

## Importing Details of Alibaba Cloud Resources

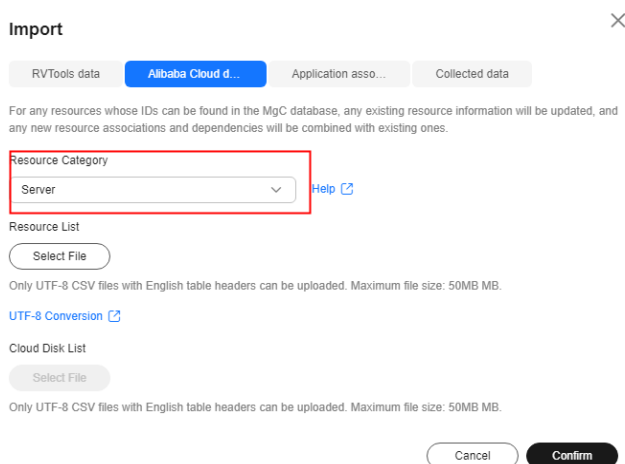
- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select an **application migration project** from the drop-down list.
- Step 2** In the navigation pane, choose **Discover > Source Resources**.
- Step 3** Click the **Import** tab. Then click the **Import** card.

**Figure 1-25** Import



- Step 4** Click **Alibaba Cloud data** option, select the category of resources to be imported from the **Resource Category** drop-down list, and upload the corresponding resource list.

**Figure 1-26** Selecting a resource category



### NOTICE

Only CSV files encoded in UTF-8 format with English table headers can be imported. The size of a single file cannot exceed 50 MB. For details about how to convert the encoding format of a CSV file to UTF-8, see [How Do I Convert the Encoding Format of a CSV File to UTF-8?](#)

| Resource Category | Procedure                                                                                                                                                                                                                                                                   |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Servers           | <ol style="list-style-type: none"> <li>Under <b>Resource List</b>, click <b>Select File</b> and select the <a href="#">exported ECS list</a>.</li> <li>Under <b>Cloud Disk List</b>, click <b>Select File</b> and select the <a href="#">exported disk list</a>.</li> </ol> |
| Redis             | Under <b>Resource List</b> , click <b>Select File</b> and select the <a href="#">exported Redis instance list</a> .                                                                                                                                                         |
| Object storage    | Under <b>Resource List</b> , click <b>Select File</b> and select the <a href="#">exported OSS bucket list</a> .                                                                                                                                                             |
| Databases         | Click <b>Select File</b> next to <b>Resource List</b> and select the <a href="#">exported MySQL instance list</a> .                                                                                                                                                         |

**Step 5** Click **Confirm**. The **Task Center** page . After the resource list is uploaded, return to the **Source Resources** page and view the imported resources on the corresponding tab.

**Step 6** (Optional) Group imported Alibaba Cloud resources as applications. For details, see [Grouping Resources as Applications](#). Then assess the applications to obtain recommendations for Huawei Cloud resources. For details, see [Getting Target Recommendations](#).

----End

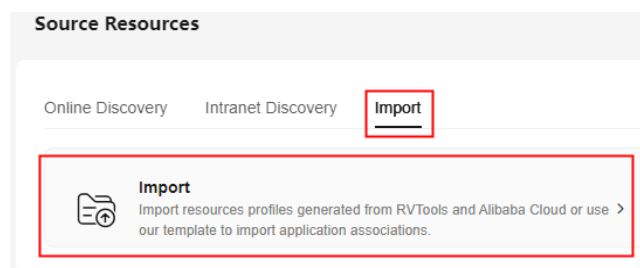
## 1.4.5 Importing Application Associations

You can import application details obtained from the configuration management database in your source environment to MgC. Once imported, MgC will analyze these details to identify application dependencies and associations.

### Procedure

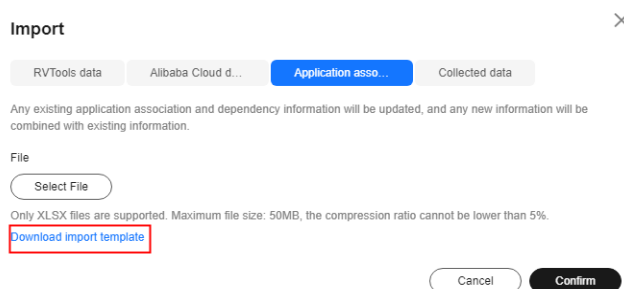
- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select an **application migration project** from the drop-down list.
- Step 2** In the navigation pane, choose **Discover > Source Resources**.
- Step 3** Click the **Import** tab. Then click the **Import** card.

Figure 1-27 Import



- Step 4** Click the **Application associations** option and download the import template.

Figure 1-28 Downloading the template for importing application associations



- Step 5** Populate the template with your application details and save the file. In the file, fields highlighted in yellow are mandatory. Then click **Select File** to upload the saved file to MgC.
- Step 6** After the upload is successful, click **Confirm**. The **Task Center** page is displayed. The system automatically starts extracting resource details from the uploaded file.
  - If the task status is **Succeeded**, you can go to the **Applications** page to view the import results.
  - If the task status is **Failed**, click the task name to view the data source that failed to be collected. You can move the cursor to the collection status to view the failure cause. After handling the failure cause, import the file again.

----End

## 1.4.6 Importing Discovery Results

You can use offline collectors to discover your resources and applications and collect their details, and import the collected details to MgC for automated application dependency analysis.

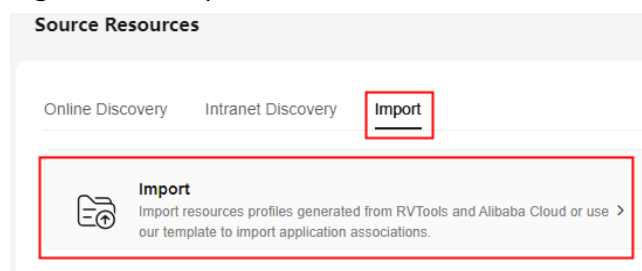
### Prerequisites

You have [created collection tasks using offline collectors](#) and have obtained the collection results.

### Procedure

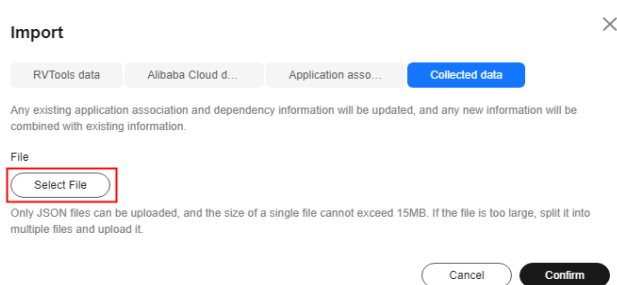
- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select an [application migration project](#) from the drop-down list.
- Step 2** In the navigation pane, choose **Discover > Source Resources**.
- Step 3** Click the **Import** tab. Then click the **Import** card.

Figure 1-29 Import



- Step 4** Click the **Collected data** option, click **Select File**, and upload the collection result file in JSON format.

Figure 1-30 Uploading the data collected by tools



- Step 5** After the upload is successful, click **Confirm**. The **Task Center** page is displayed. The system automatically starts extracting resource details from the uploaded file.
  - If the task status is **Succeeded**, you can go to the **Applications** page to view the import results.
  - If the task status is **Failed**, click the task name to view the data source that failed to be collected. You can move the cursor to the collection status to view the failure cause. After handling the failure cause, import the file again.

----End



## 1.4.7 Manually Adding Resources

You can manually add servers and Oracle databases to MgC. To gather details about these resources, you need to install the MgC Agent (formerly Edge) in the source environment.

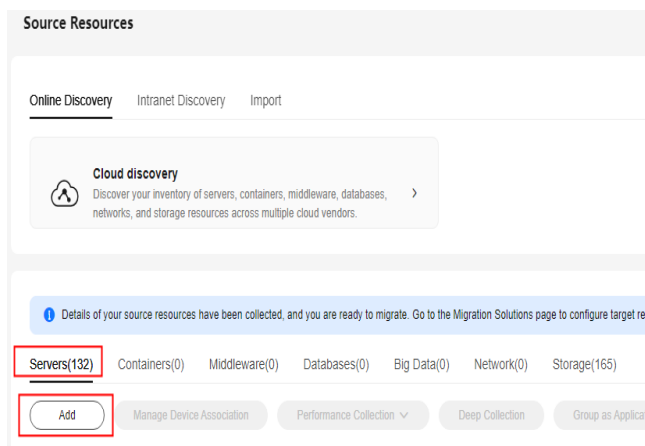
### Preparations

- [Create a project](#) on the MgC console.
- [Install the MgC Agent](#) in the source intranet environment and [connect the MgC Agent to MgC](#).
- [Add resource credentials](#) to the MgC Agent.

### Adding a Server

- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select an [application migration project](#) from the drop-down list.
- Step 2** In the navigation pane, choose **Discover > Source Resources**.
- Step 3** On the **Servers** tab, click **Add** above the list.

**Figure 1-31** Adding a server



- Step 4** In the displayed dialog box, configure parameters listed in [Table 1-16](#) and click **Confirm**. The system automatically checks the credential status and starts collecting resource details.

**Table 1-16** Parameters for adding a server

| Parameter | Description                                               |
|-----------|-----------------------------------------------------------|
| Name      | Enter a server name.                                      |
| MgC Agent | Select the MgC Agent installed in the source environment. |
| Type      | Select the OS type of the source server.                  |

| Parameter         | Description                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Access IP Address | Enter the IP address of the source server.<br>If the source server is in the same VPC as the MgC Agent, you can enter the private IP address of the server. Otherwise, you have to enter its public IP address.                                                                                                                                                             |
| Port              | Enter the port on the source server that allows access from the MgC Agent. <ul style="list-style-type: none"> <li>By default, port 5985 on Windows source servers must be opened to the MgC Agent. The port cannot be changed.</li> <li>By default, port 22 on Linux source servers must be opened to the MgC Agent. You can specify a different port if needed.</li> </ul> |
| Credential        | Select the server credential. If the credential is not displayed in the list, go to the MgC Agent console, <b>add the server credential</b> , and synchronize it to MgC.                                                                                                                                                                                                    |

**Step 5** After the server is added, view it in the list.

----End

## Adding a Database

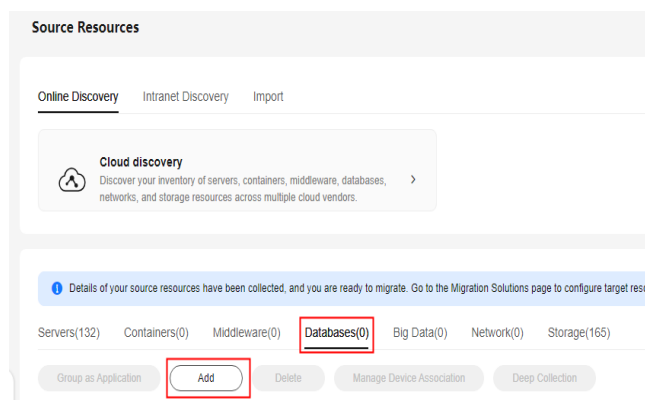
**Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select an **application migration project** from the drop-down list.

**Step 2** In the navigation pane, choose **Discover > Source Resources**.

**Step 3** Click the **Databases** tab.

**Step 4** Click **Add** above the list.

**Figure 1-32** Adding a database



**Step 5** Set the parameters listed in **Table 1-17**.

**Add Database**
✕

\* Name

\* Mgc Agent Device

\* Type

\* IP   
Ensure that the Mgc Agent device can access the resources through their public or private IP addresses.

\* Port

\* Service Name/SID

\* Credential

**Table 1-17** Parameters for adding a database

| Parameter        | Description                                                                                                                                                                                                                                                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name             | Enter a name.                                                                                                                                                                                                                                                                                                                   |
| MgC Agent        | Select the MgC Agent you connected to MgC.                                                                                                                                                                                                                                                                                      |
| Type             | Select <b>Oracle</b> .                                                                                                                                                                                                                                                                                                          |
| IP Address       | Enter the IP address for connecting to the source Oracle database server.                                                                                                                                                                                                                                                       |
| Port             | Enter the listening port of the source Oracle database. The default value is 1521.                                                                                                                                                                                                                                              |
| Service Name/SID | Enter the service name of the source database. The default value is <b>ORCL</b> .<br><br>You can log in to the Oracle database server and run the following command to view the service name of the database you want to add to MgC:<br><code>SELECT instance_name FROM v\$instance;</code>                                     |
| Credential       | Select the database credential. If the credential is not displayed in the drop-down list, go to the MgC Agent console, <b>add the credential</b> , and synchronize it to MgC. When you add the credential to the MgC Agent, set <b>Resource Type</b> to <b>Database</b> and <b>Authentication</b> to <b>Username/Password</b> . |

**Step 6** Click **Confirm**. The system automatically starts collecting details about the database. When **Collected** is displayed in the **Deep Collection** column, the collection is complete. Click the database name. On the displayed database details page, you can view the collected information.

----End

## 1.4.8 Collecting Server Performance Data

MgC can collect server performance data, including the CPU usage, memory usage, disk IOPS, inbound and outbound traffic, inbound and outbound packets, and the number of network connections. The collected performance data will be used by MgC to recommend rightsized servers.

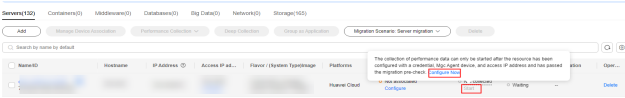
### Notes

- Performance data of VMware VMs within a specified period can be collected during the automatic scan. For discovered VMs, a separate performance collection is not necessary. The performance data collected during the VMware VM scanning comes from the historical data stored in the vCenter. The default data retention policy in the vCenter is as follows:  
One day: Data points are collected every 5 minutes.  
One week: Data points are collected every 30 minutes.  
One month: Data points are collected every two hours.
- After a collection starts, performance data is collected every 5 minutes by default.
- The collection duration should be at least 1 hour. If the collection duration is too short, the maximum and average values in 7- and 30-day history cannot be calculated.
- A performance collection runs for seven days by default and stops after the period ends. You can stop or restart the collection at any time. After the collection is restarted, the collection period is recalculated.
- If a metric is collected multiple times, the data from the most recent collection is used.
- Collected performance data will be retained for 180 days and automatically deleted after that.
- It is recommended that the MgC Agent (formerly Edge) be installed on an independent server to ensure collection stability and efficiency.
- The MgC Agent can collect performance data from up to 1,000 Linux servers at the same time. If there are 1,000 or more Linux servers to be collected, the server where the MgC Agent is installed must have at least 8 CPUs and 16 GB of memory with at least 8 GB available.
- The MgC Agent can collect performance data from up to 500 Windows servers at the same time. If there are 500 or more Windows servers to be collected, the server where the MgC Agent is installed must have at least 16 CPUs and 32 GB of memory with at least 8 GB available.

### Prerequisites

- You have completed a discovery task over the Internet or an intranet, or you have manually added servers to MgC.
- You have [installed the MgC Agent](#) in the source intranet environment and have [connected the MgC Agent to MgC](#).
- You have [added source server credentials](#) to the MgC Agent.

## Procedure

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select an **application migration project** from the drop-down list.
- Step 2** In the navigation pane, choose **Discover > Source Resources**.
- Step 3** On the **Servers** tab, configure MgC agents and credentials for the servers whose performance data needs to be collected.
- If the **Start** button in the **Performance Collection** column is dimmed, move the cursor to the **Start** button. In the dialog box that is displayed, click **Configure Now**.
- 
- If the **Start** button in the **Performance Collection** column is available, the configuration is complete. In this case, skip this step and go to **step 7**.
- Step 4** Configure the parameters listed in **Table 1-18**.

**Table 1-18** Parameters for configuring a migration pre-check

| Parameter         | Configuration                                                                                                                                                                                                                                                                                                                                                               |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type              | Set this parameter based on the source server OS type.                                                                                                                                                                                                                                                                                                                      |
| MgC Agent         | Select the MgC Agent installed in the source environment.                                                                                                                                                                                                                                                                                                                   |
| Access IP Address | Select the IP address for accessing the source server. It can be a public or private IP address. If you need to use a proxy to access the server, enter the proxy IP address. After the migration pre-check passes, the IP address will be used for subsequent migration.                                                                                                   |
| Port              | Enter the port on the source server that allows access from the MgC Agent. <ul style="list-style-type: none"> <li>By default, port 5985 on Windows source servers must be opened to the MgC Agent. The port cannot be changed.</li> <li>By default, port 22 on Linux source servers must be opened to the MgC Agent. You can specify a different port if needed.</li> </ul> |
| Credential        | Select the server credential. If the credential is not displayed in the list, go to the MgC Agent console, <b>add the server credential</b> , and synchronize it to MgC.                                                                                                                                                                                                    |

- Step 5** Click **Confirm**. The system will verify the correctness of the configuration.
- Step 6** After the configuration is verified, click **Start** in the **Performance Collection** column to start collecting server performance data. The collection status will change to **Collecting**.

After performance data collection starts, you can:

- View the collected data.
  - a. Click a server name to go to its details page. In the **Performance Info** area, you can view the collected performance data.

---

**NOTICE**

- Aggregated values for 7-day and 30-day periods are calculated only after performance data collection has stopped.
- If data is collected for less than 1 hour, the system waits 1 hour after the collection stops before aggregating the data.
- If a metric is collected multiple times, the data from the most recent collection is used.

- b. Click **View** in the **Operation** column to view the details and line chart about the performance metric in the collection period.
- Stop the collection.  
Click **Stop** to pause performance data collection.

----End

## 1.4.9 Grouping Resources as Applications

### Overview

You can divide discovered resources into groups, which we refer to as applications. Subsequent recommendation and migration processes are executed based on these applications.

### Procedure

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select an **application migration project** from the drop-down list.
- Step 2** In the navigation pane, choose **Discover > Source Resources**.
- Step 3** In the **Resources** area, choose a resource category to view the resource list.
- Step 4** Select the resources to be added to an application and choose **Group as Application** in the upper left corner of the page.
- Step 5** Select the application from the drop-down list. If no applications are available, click **Create Application** in the displayed dialog box. Then enter an application name and description, select a business scenario, environment, and region, and click **Create**.
- Step 6** Click **OK**. You can view the application name in the **Application** column of the resources.

----End

## 1.5 Application Management

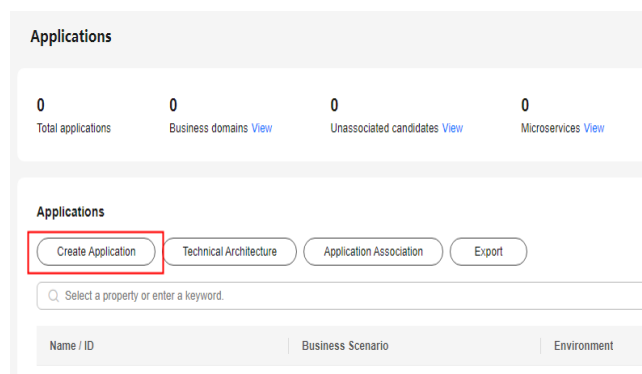
### 1.5.1 Creating an Application

You can group resources with a shared business purpose as an application. These applications will be used for getting target resource recommendations and creating migration workflows.

#### Creating an Application

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, choose a **project** from the drop-down list.
- Step 2** In the navigation pane, choose **Discover > Applications**.
- Step 3** Click **Create Application**.

**Figure 1-33** Creating an application



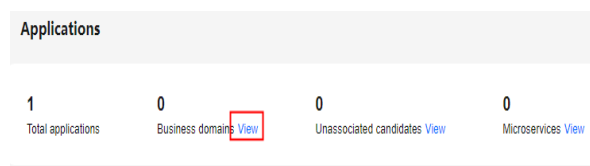
- Step 4** Enter an application name and description, select a service scenario and environment, select the region you are migrating to, and click **Create Application**. The application is successfully created, and the page for adding resources to the application is displayed.
  - If source resources have been discovered, and you want to add the discovered resources to the created application, select the resources and click **Add Now**.
  - If no source resources have been discovered, click **Add Later**. You can add resources to the application later.

----End

#### Managing Applications

You can manage applications by business domain.

- Step 1** On the **Applications** page, click **View** next to **Business domains**.



- Step 2** Click **Add**, enter a business domain name, select the applications you want to add to this domain, and click **Save**.

The screenshot shows a 'Business Domains' window. At the top, there is a tooltip: 'A business domain is a collection of applications grouped by business activity. Business domains can be migrated and tested in a single batch. They help you automatically plan migration batches.' Below the tooltip is an 'Add' button. Underneath is a table with the following structure:

| Business Domain      | Application Quantity | Application Name     | Operation          |
|----------------------|----------------------|----------------------|--------------------|
| <input type="text"/> | 0                    | <input type="text"/> | <b>Save</b> Delete |

At the bottom of the table, there is a pagination control showing '10' records per page, 'Total Records: 0', and a page number '1'.

----End

## Modifying an Application

- Step 1** In the application list, locate the application you want to modify and click **Modify** in the **Operation** column.
- Step 2** Modify application parameters and click **OK**.

----End

## 1.5.2 Adding Discovered Resources to an Application

The following procedure describes how to group discovered source servers as applications. These applications will be used for subsequent resource assessment and migration.

### Prerequisites

Source servers have been discovered through online and intranet-based discovery tasks or manual addition.

### Procedure

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, choose a **project** from the drop-down list.
- Step 2** In the navigation pane, choose **Discover > Applications**.
- Step 3** In the application list, click an application name.
- Step 4** Select the category of resources to be grouped into the application. The following describes how to add source servers to the application. The procedure also applies to other categories of resources.
- Step 5** On the **Servers** tab, click **Add Resources** above the list.
- Step 6** Select the source servers to be added to the application and click **Add Now** in the lower right corner. You can see the source servers added to the application in the list.

----End



## 1.5.3 Manually Adding Custom Resources to an Application

You can add custom servers and Oracle databases to an application. To gather details about these resources, you need to install the MgC Agent (formerly Edge) in the source environment.

### Preparations

- [Create a migration project](#) on the MgC console.
- [Install the MgC Agent](#) in the source intranet environment and [connect the MgC Agent to MgC](#).
- [Add resource credentials](#) to the MgC Agent.
- [Created an application](#) on the application management page.

### Add Servers to the Application

- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, choose a [project](#) from the drop-down list.
- Step 2** In the navigation pane, choose **Discover > Applications**.
- Step 3** In the application list, click an application name.
- Step 4** On the **Servers** tab, click **Add** above the list.
- Step 5** In the displayed dialog box, configure parameters listed in [Table 1-19](#) and click **Confirm**. The system automatically checks the credential status and starts collecting resource details.

**Table 1-19** Parameters for adding a server

| Parameter         | Description                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name              | Enter a server name.                                                                                                                                                                                                                                                                                                                                                            |
| MgC Agent         | Select the MgC Agent installed in the source environment.                                                                                                                                                                                                                                                                                                                       |
| Type              | Select the OS type of the source server.                                                                                                                                                                                                                                                                                                                                        |
| Access IP Address | Enter the IP address of the source server.<br>If the source server is in the same VPC as the MgC Agent, you can enter the private IP address of the server. Otherwise, you have to enter its public IP address.                                                                                                                                                                 |
| Port              | Enter the port on the source server that allows access from the MgC Agent. <ul style="list-style-type: none"> <li>• By default, port 5985 on Windows source servers must be opened to the MgC Agent. The port cannot be changed.</li> <li>• By default, port 22 on Linux source servers must be opened to the MgC Agent. You can specify a different port if needed.</li> </ul> |

| Parameter  | Description                                                                                                                                                                       |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Credential | Select the server credential. If the credential is not displayed in the list, go to the MgC Agent console, <a href="#">add the server credential</a> , and synchronize it to MgC. |

**Step 6** After the server is added, view it in the list.

----End

## Adding Databases to the Application

**Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, choose a [project](#) from the drop-down list.

**Step 2** In the navigation pane, choose **Discover > Applications**.

**Step 3** In the application list, click an application name.

**Step 4** On the **Databases** tab, click **Add** above the list.

**Step 5** Set the parameters listed in [Table 1-20](#).

**Table 1-20** Parameters for adding a database

| Parameter  | Description                                                                        |
|------------|------------------------------------------------------------------------------------|
| Name       | Enter a name.                                                                      |
| MgC Agent  | Select the MgC Agent you connected to MgC.                                         |
| Type       | Select <b>Oracle</b> .                                                             |
| IP Address | Enter the IP address for connecting to the source Oracle database server.          |
| Port       | Enter the listening port of the source Oracle database. The default value is 1521. |

| Parameter        | Description                                                                                                                                                                                                                                                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Service Name/SID | Enter the service name of the source database. The default value is <b>ORCL</b> .<br>You can log in to the Oracle database server and run the following command to view the service name of the database you want to add to MgC:<br><pre>SELECT instance_name FROM v\$instance;</pre>                                           |
| Credential       | Select the database credential. If the credential is not displayed in the drop-down list, go to the MgC Agent console, <b>add the credential</b> , and synchronize it to MgC. When you add the credential to the MgC Agent, set <b>Resource Type</b> to <b>Database</b> and <b>Authentication</b> to <b>Username/Password</b> . |

**Step 6** Click **Confirm**. The system automatically starts collecting details about the database. When **Collected** is displayed in the **Deep Collection** column, the collection is complete. Click the database name. On the displayed database details page, you can view the collected information.

----End

## 1.5.4 Collecting Server Performance Data

MgC can collect server performance data, including the CPU usage, memory usage, disk IOPS, inbound and outbound traffic, inbound and outbound packets, and the number of network connections. The collected performance data will be used by MgC to recommend rightsized servers.

Collect performance data of host resources in an application on the application details page.

### Notes

- Performance data of VMware VMs within a specified period can be collected during the automatical scan. For discovered VMs, a separate performance collection is not necessary. The performance data collected during the VMware VM scanning comes from the historical data stored in the vCenter. The default data retention policy in the vCenter is as follows:
  - One day: Data points are collected every 5 minutes.
  - One week: Data points are collected every 30 minutes.
  - One month: Data points are collected every two hours.
- After a collection starts, performance data is collected every 5 minutes by default.
- The collection duration should be at least 1 hour. If the collection duration is too short, the maximum and average values in 7- and 30-day history cannot be calculated.
- A performance collection runs for seven days by default and stops after the period ends. You can stop or restart the collection at any time. After the collection is restarted, the collection period is recalculated.

- If a metric is collected multiple times, the data from the most recent collection is used.
- Collected performance data will be retained for 180 days and automatically deleted after that.
- It is recommended that the MgC Agent (formerly Edge) be installed on an independent server to ensure collection stability and efficiency.
- The MgC Agent can collect performance data from up to 1,000 Linux servers at the same time. If there are 1,000 or more Linux servers to be collected, the server where the MgC Agent is installed must have at least 8 CPUs and 16 GB of memory with at least 8 GB available.
- The MgC Agent can collect performance data from up to 500 Windows servers at the same time. If there are 500 or more Windows servers to be collected, the server where the MgC Agent is installed must have at least 16 CPUs and 32 GB of memory with at least 8 GB available.

## Prerequisites

- You have **manually added custom source resources** or **added discovered source resources**.
- You have **installed the MgC Agent** in the source intranet environment and have connected it to MgC.
- You have **added source server credentials** to the MgC Agent.

## Procedure

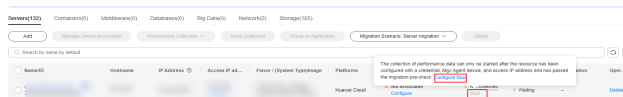
**Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, choose a **project** from the drop-down list.

**Step 2** In the navigation pane, choose **Discover > Applications**.

**Step 3** In the application list, click an application name.

**Step 4** On the **Servers** tab, configure MgC agents and credentials for the servers whose performance data needs to be collected.

- If the **Start** button in the **Performance Collection** column is dimmed, move the cursor to the **Start** button. In the dialog box that is displayed, click **Configure Now**.



- If the **Start** button in the **Performance Collection** column is available, the configuration is complete. In this case, skip this step and go to **step 7**.

**Step 5** Configure the parameters listed in **Table 1-21**.

**Table 1-21** Parameters for configuring a migration pre-check

| Parameter | Configuration                                             |
|-----------|-----------------------------------------------------------|
| Type      | Set this parameter based on the source server OS type.    |
| MgC Agent | Select the MgC Agent installed in the source environment. |

| Parameter         | Configuration                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Access IP Address | Select the IP address for accessing the source server. It can be a public or private IP address. If you need to use a proxy to access the server, enter the proxy IP address. After the migration pre-check passes, the IP address will be used for subsequent migration.                                                                                                       |
| Port              | Enter the port on the source server that allows access from the MgC Agent. <ul style="list-style-type: none"> <li>• By default, port 5985 on Windows source servers must be opened to the MgC Agent. The port cannot be changed.</li> <li>• By default, port 22 on Linux source servers must be opened to the MgC Agent. You can specify a different port if needed.</li> </ul> |
| Credential        | Select the server credential. If the credential is not displayed in the list, go to the MgC Agent console, <a href="#">add the server credential</a> , and synchronize it to MgC.                                                                                                                                                                                               |

**Step 6** Click **Confirm**. The system will verify the correctness of the configuration.

**Step 7** After the configuration is verified, click **Start** in the **Performance Collection** column to start collecting server performance data. The collection status will change to **Collecting**.

After performance data collection starts, you can:

- View the collected data.
  - a. Click a server name to go to its details page. In the **Performance Info** area, you can view the collected performance data.

---

**NOTICE**

- Aggregated values for 7-day and 30-day periods are calculated only after performance data collection has stopped.
- If data is collected for less than 1 hour, the system waits 1 hour after the collection stops before aggregating the data.
- If a metric is collected multiple times, the data from the most recent collection is used.

- b. Click **View** in the **Operation** column to view the details and line chart about the performance metric in the collection period.
- Stop the collection.  
Click **Stop** to pause performance data collection.

----End

## 1.6 Migration Preparations

### 1.6.1 Deploying the MgC Agent (Formerly Edge)

Before using the big data functions, you need to deploy the MgC Agent on a server that can access your metadata source.

---

 **CAUTION**

The MgC Agent does not support automatic restart. Do not restart the MgC Agent during task execution, or tasks will fail.

---

#### Preparations

- Prepare a Linux server for installing the MgC Agent in the source intranet environment. The Linux server must:
  - Be able to access the Internet and the domain names of MgC, IoTDA, and other cloud services. For details about the domain names to be accessed, see [Domain Names](#).
  - Allow the ports required by the MgC Agent (formerly Edge). For details about the required ports, see [Communication Matrix](#).
  - Allow outbound traffic on 8883 if the server is in a security group.
  - Run CentOS 8.X.
  - Have at least 4 CPUs and 8 GB of memory. If you want to use big data verification, the server must have at least 8 CPUs and 16 GB of memory.

---

 **CAUTION**

Do not install the MgC Agent on a source server to be migrated.

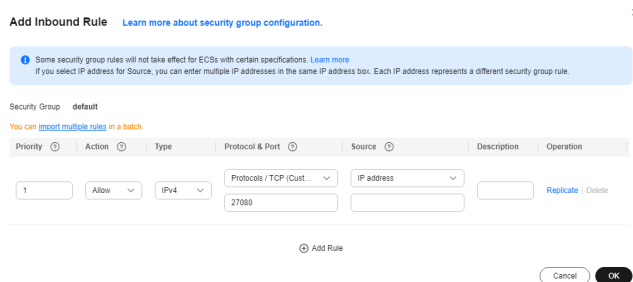
- **High resource consumption:** The MgC Agent consumes CPU and memory resources during collection and migration. If a large number of migration tasks are performed by the MgC Agent, services on the source server may be affected.
  - **Port occupation:** The MgC Agent occupies some ports on the server, which may affect services running on it.
- 
- Run the following command to check whether rng-tools is installed on the Linux server where the MgC Agent is installed:

```
rpm -qa | grep rng-tools
```

If no rng-tools-related information is displayed, rng-tools is not installed on the server. Run the following command to install rng-tools:

```
yum -y install rng-tools
```
  - Disable any antivirus and protection software on the Linux server where the MgC Agent is installed. This type of software may stop the MgC Agent from executing migration commands, resulting in migration failures.

- Add an inbound rule to the security group of the Linux server to allow TCP traffic on port 27080. Set the source address to the IP address of the Windows server you use to log in to the MgC Agent console.



- [Sign up for a HUAWEI ID and enable Huawei Cloud services](#), and obtain an AK/SK pair for the account.
- [Create a migration project](#) on the MgC console.

## Downloading and Installing the MgC Agent

**Step 1** Sign in to the [MgC console](#) from the Linux server you prepared.

**Step 2** In the navigation pane on the left, choose **MgC Agents**.

**Step 3** In the Linux area, click **Download Installation Package** or **Copy Download Command** to download the MgC Agent installation program to the Linux server.

**Step 4** Decompress the MgC Agent installation package.

```
tar zxvf Edge.tar.gz
```

**Step 5** Go to the **scripts** directory in the decompressed MgC Agent directory.

```
cd Edge/scripts/
```

**Step 6** Run the MgC Agent installation script.

```
./install.sh
```

**Step 7** Enter the EIP bound to the NIC of the Linux server. The IP address will be used for accessing the MgC Agent console. If the entered IP address is not used by the Linux server, the system will prompt you whether to use any public IP address of the Linux server as the MgC Agent access address.

```
Please enter the access address of the local server:1.1.1.1
The entered IP address is not in the local IP address list.
Do you want to allow access from all IP addresses?(y/n)
```

**Step 8** Check if the message shown in the following figure is displayed. If it is, the MgC Agent for Linux has been installed. The port in the following figure is for reference only. Note the actual port returned. Generally, the port is 27080.

```
There are some variables appended into /etc/profile, if you want to make these available in current terminal, please run command 'source /etc/profile'

Open the Edge management console by accessing https://'Available IP of local host':27080/ from the browser.
```

Update environment variables.

```
source /etc/profile
```

**Step 9** On the Windows server for which an inbound rule is added to the security group of the server where the MgC Agent is installed, open a browser and enter **https://**

<IP-address-entered-in-[step-7](#)>:<port-obtained-in-[step-8](#)> in the address box to access the user registration page of the MgC Agent. For example, if the IP address entered in step 7 is **192.168.x.x** and the port returned in step 8 is **27080**, the MgC Agent access address is **https://192.168.x.x:27080**.

---

**NOTICE**

If there are access problems, check the IP address entered in the address box and the inbound rule settings of the security group of the Linux server with the MgC Agent installed.

---

----End

## Registering an Account

When you log in to the MgC Agent console for the first time, you must set a username and password. Keep the username and password secure.

- Step 1** On the **Register** page, specify a username and password, confirm the password, and click **Privacy Statement**.

- Step 2** Read the privacy statement carefully before selecting **I have read and agree to the Privacy Statement**, and click **Register**.

---

**CAUTION**

You are advised to change your password for accessing the MgC Agent every three to six months.

---

----End

## Connecting the MgC Agent to MgC

- Step 1** Use the registered account to log in to the MgC Agent console.
- Step 2** On the **Overview** page, click **Connect** in the upper right corner. The **Connect to MgC** page is displayed on the right.



**Figure 1-34** Connecting the MgC Agent to MgC

The screenshot shows a 'Connect to MgC' dialog box with three steps:

- Step 1: Enter Credential**
  - Region: A dropdown menu with '--Select--'.
  - Huawei Cloud Account AK: A text input field.
  - Huawei Cloud Account SK: A text input field with a 'List Migration Projects' link.
  - Save as Target Credential: A checked checkbox with a note: 'This credential will be deleted by default after the connection is complete. If you choose to save the credentials, they will be encrypted and saved locally and will be used for migrating source servers and uploading logs. guide right\_01\_3p\_3'.
- Step 2: Select MgC Migration Project**
  - Migration Project: A dropdown menu with '--Select--'.
- Step 3: Preset MgC Agent Name**
  - A text input field for the agent name.

A 'Connect' button is located at the bottom right of the dialog.

**Step 3** In **Step 1: Enter Cloud Credential**, select the region where your MgC migration project is located, enter the AK/SK of your Huawei Cloud account, and click **Query Project**. After the MgC Agent is authenticated using the entered AK/SK pair, you can go to the next step. If the system displays a message indicating that the AK/SK pair is incorrect, try to rectify the fault by following the instructions in [What Can I Do If the AK/SK Verification Fails?](#)

#### NOTICE

If your source servers need to be migrated, the entered AK/SK pair must have permissions to use SMS. For details, see [SMS Custom Policies](#).

Determine whether to save the entered AK/SK pair as the target credential which will be used for migrating your workloads to Huawei Cloud.

- If you select **No**, the entered AK/SK pair will be deleted after the MgC Agent is connected to MgC.
- If you select **Yes**, the entered AK/SK pair will be encrypted and saved locally after the connection to MgC is established. When you migrate workloads to Huawei Cloud, the AK/SK pair will be delivered to SMS-Agent on the source servers for executing the migration.

**Step 4** In **Step 2: Select MgC Migration Project**, select a **migration project** from the project drop-down list. The MgC Agent will report the collected information about your source resources to this project.

**Step 5** In **Step 3: Preset MgC Agent Name**, specify a name for the MgC Agent, which will be displayed on the MgC console, and click **Next**. Confirm the connection to MgC, and click **OK**.

 CAUTION

After the MgC Agent is connected to MgC, the name you specified here cannot be modified.

**Step 6** If **Connected** shows up on the overview page, the connection to MgC is successful.

----End

## Adding Resource Credentials

You can add credentials of the following types of resources to the MgC Agent: private clouds, servers, big data clusters, and containers. For details about the authentication methods supported for each resource type, see [Table 1-22](#).

**Table 1-22** Authentication methods

| Resource Type       | Authentication Method                                                                                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Public cloud        | <ul style="list-style-type: none"> <li>AK/SK</li> <li>Configuration file</li> <li>ID/Secret</li> </ul> | <ul style="list-style-type: none"> <li>AK/SK pairs of cloud platforms, such as Huawei Cloud, Alibaba Cloud, AWS, Tencent Cloud, Qiniu Cloud, and Kingsoft Cloud</li> <li>Upload the configuration file used to access Google Cloud. The configuration file contains credentials for Google Cloud service accounts, and the file must be in .json format and cannot exceed 4 KB.</li> <li>IDs and secrets are Azure credentials. To learn how to obtain Azure credentials, see <a href="#">How Do I Obtain Azure Credentials?</a></li> </ul> |
| Private cloud       | Username/Password                                                                                      | Enter the username and password for logging in to the source private cloud.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Databases           | Username/Password                                                                                      | Enter the username and password of the database.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Big data - Executor | Username/Password                                                                                      | <p>Enter the username and password for logging in to the server deployed as an executor. Then specify <b>Network Range</b>, which can be a single IP address or an IP address range.</p> <p>The value can be:</p> <ul style="list-style-type: none"> <li>A single IP address, for example, 192.168.10.10/32</li> <li>An IP address range, for example, 192.168.52.0/24</li> <li>All IP addresses. You need to enter <b>0.0.0.0/0</b>.</li> </ul>                                                                                            |

| Resource Type                     | Authentication Method | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Big data - Hive Metastore         | Username/Key          | Upload the <b>core-site.xml</b> , <b>hivemetastore-site.xml</b> , <b>hive-site.xml</b> , <b>krb5.conf</b> , and <b>user.keytab</b> files. For details about how to obtain the certificate files, see <a href="#">How Do I Obtain the Hive Metastore Credential Files?</a>                                                                                                                                                                                                                                                                                                                |
| Big data - Data Lake Search (DLI) | AK/SK                 | Enter the AK/SK pair of the Huawei Cloud account. For details about how to obtain an AK/SK pair, see <a href="#">How Do I Obtain the AK/SK and Project ID?</a>                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Big Data - MaxCompute             | AK/SK                 | Enter the AK/SK pair of the source Alibaba Cloud account. For details about how to obtain the key pair, see <a href="#">Viewing the Information About AccessKey Pairs of a RAM User</a> .                                                                                                                                                                                                                                                                                                                                                                                                |
| Big data - Doris                  | Username/Password     | Enter the username and password of the Doris database.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Big data - HBase                  | Username/Key          | <ul style="list-style-type: none"> <li>For an unsecured cluster, upload the <b>core-site.xml</b>, <b>hdfs-site.xml</b>, <b>yarn-site.xml</b>, <b>mapred-site.xml</b>, and <b>hbase-site.xml</b> files.</li> <li>For a secured cluster, upload seven files, including <b>core-site.xml</b>, <b>hdfs-site.xml</b>, <b>yarn-site.xml</b>, <b>krb5.conf</b>, <b>user.keytab</b>, <b>mapred-site.xml</b>, and <b>hbase-site.xml</b>.</li> </ul> <p>The preceding configuration files are usually stored in the <b>conf</b> subdirectory of the Hadoop and HBase installation directories.</p> |
| Big data - ClickHouse             | Username/Password     | Enter the username and password of the ClickHouse database.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Windows server                    | Username/Password     | <p>Enter the username and password for logging in to the server. Then specify <b>Network Range</b>, which can be a single IP address or an IP address range.</p> <p>The value can be:</p> <ul style="list-style-type: none"> <li>A single IP address, for example, 192.168.10.10/32</li> <li>An IP address range, for example, 192.168.52.0/24</li> <li>All IP addresses. You need to enter <b>0.0.0.0/0</b>.</li> </ul>                                                                                                                                                                 |

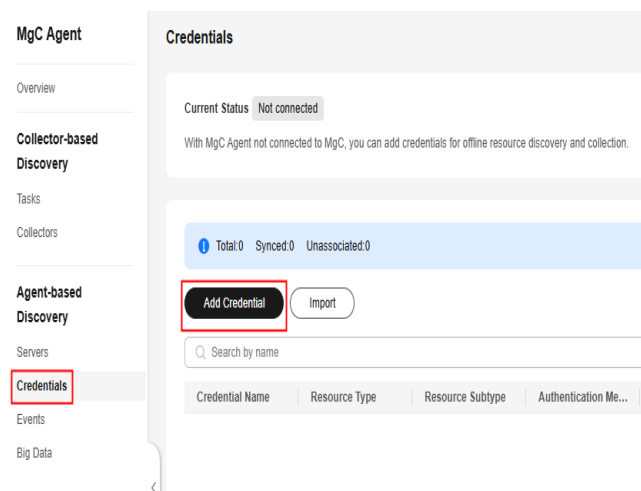
| Resource Type | Authentication Method                                                                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Linux server  | <ul style="list-style-type: none"> <li>Username/Password</li> <li>Username/Key</li> </ul> | <ul style="list-style-type: none"> <li>If you select <b>Username/Password</b>, enter the username and password for logging in to the server.</li> <li>If you select <b>Username/Key</b>, enter the username and the password of the key file for logging in to the server, and upload the key file in .pem format.</li> </ul> <p><b>NOTICE</b><br/>If the key file is not encrypted, you do not need to enter the password.</p> <p>Then specify <b>Network Range</b>, which can be a single IP address or an IP address range. The value can be:</p> <ul style="list-style-type: none"> <li>A single IP address, for example, 192.168.10.10/32</li> <li>An IP address range, for example, 192.168.52.0/24</li> <li>All IP addresses. You need to enter <b>0.0.0.0/0</b>.</li> </ul> |
| Container     | Configuration file                                                                        | The configuration file must be a .json or .yaml file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

**Step 1** Use the registered username and password to log in to the MgC Agent console.

**Step 2** In the navigation pane, choose **Agent-based Discovery > Credentials**.

**Step 3** Click **Create Certificate** above the list.

**Figure 1-35** Adding a credential



**Step 4** Select a resource type and authentication method as prompted. Specify a credential name, enter your credentials, and click **Confirm**.

- If the MgC Agent is not connected to MgC, the added resource credentials can be used for deep collection.
- If the MgC Agent is connected to MgC, the added resource credentials will be automatically synchronized to MgC.

----End

## 1.6.2 Collecting Metadata

### 1.6.2.1 Creating a Metadata Connection

Create a connection to your metadata source, so you can collect source metadata to extract the list of databases and tables.

You can create connections to big data cloud services and components listed in [Table 1-23](#).

**Table 1-23** Supported metadata sources

| Type                    | Metadata Source                                                                                                                                                                                                                                                     |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Big data components     | <ul style="list-style-type: none"><li>• Hive Metastore</li><li>• Doris</li><li>• HBase</li><li>• ClickHouse</li><li>• Delta Lake (with metadata)</li><li>• Delta Lake (without metadata)</li><li>• Hudi (with metadata)</li><li>• Hudi (without metadata)</li></ul> |
| Big data cloud services | <ul style="list-style-type: none"><li>• MaxCompute</li><li>• ApsaraDB for ClickHouse</li></ul>                                                                                                                                                                      |

#### NOTICE

- Before creating a connection to Hive Metastore, you need to obtain the IP address and port required for connecting to Hive Metastore
- Before creating a connection to MaxCompute, you need to obtain the endpoint for the region where your MaxCompute resources are hosted.
- Before creating a connection to Doris, you need to obtain the IP address and port required for accessing the Doris cluster
- Before creating a connection to HBase, you need to obtain the IP address and connection port of at least one ZooKeeper node in the HBase cluster.

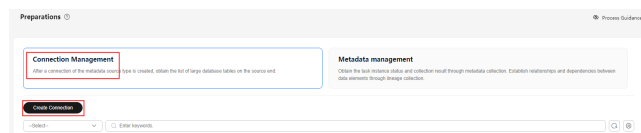
### Prerequisites

You have [installed the MgC Agent](#) on a server in the source environment.

## Procedure

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select a **big data migration project** from the drop-down list.
- Step 2** In the navigation pane, choose **Survey > Preparations**.
- Step 3** Click **Create Connection**.

**Figure 1-36** Creating a connection



- Step 4** Select a connection type and click **Next**.
- Step 5** Based on the selected connection type, configure connection parameters.
  - [Parameters for creating a connection to Hive Metastore](#)
  - [Parameters for creating a connection to Doris](#)
  - [Parameters for creating a connection to HBase](#)
  - [Parameters for creating a ClickHouse connection](#)
  - [Parameters for creating a connection to Delta Lake \(with metadata\)](#)
  - [Parameters for creating a connection to Delta Lake \(without metadata\)](#)
  - [Parameters for creating a connection to Hudi \(with metadata\)](#)
  - [Parameters for creating a connection to Hudi \(without metadata\)](#)
  - [Parameters for creating a connection to MaxCompute](#)
  - [Parameters for creating a connection to ApsaraDB for ClickHouse](#)

**Table 1-24** Parameters for creating a connection to Hive Metastore

| Parameter         | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To     | Configure this parameter based on requirements.                                                                                                                                                                                                                                                                                                                                                                                                                |
| Connection Name   | The default name is <b>Hive-Metastore-4 random characters</b> (including letters and numbers). You can also customize a name.                                                                                                                                                                                                                                                                                                                                  |
| MgC Agent         | Select the <b>MgC Agent</b> installed in the source environment.                                                                                                                                                                                                                                                                                                                                                                                               |
| Secure Connection | Determine whether to enable secure connection. <ul style="list-style-type: none"> <li>• If Hive Metastore is deployed in an unsecured cluster, do not enable secure connection.</li> <li>• If Hive Metastore is deployed in a secured cluster, enable secure connection and provide access credentials. For details about how to obtain and add credentials to MgC, see "Big data - Hive Metastore" in <a href="#">Adding Resource Credentials</a>.</li> </ul> |

| Parameter                    | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hive Version                 | Select the Hive version at the source.<br><b>CAUTION</b><br>If the source Hive version is 2.1.1, select 1.x.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Hive Metastore IP Address    | Enter the IP address for connecting to the Hive Metastore node.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Hive Metastore Thrift Port   | Enter the port for connecting to the Hive Metastore Thrift service. The default port is <b>9083</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Connect to Metadata Database | <p>During an incremental data verification, querying with Hive Metastore on more than 30,000 partitions may lead to a memory overflow (OOM) since all partition information is loaded into memory. Connecting to the MySQL metadata database can effectively prevent this issue.</p> <ul style="list-style-type: none"><li>• If you disable this option, the system queries the information of Hive tables and partitions using Hive Metastore.</li><li>• If you enable this option, configure the MySQL database information. The system will query the information of Hive tables and partitions through the MySQL database. You need to set the following parameters:<ul style="list-style-type: none"><li>– <b>Metadata Database Type:</b> Only MySQL is supported.</li><li>– <b>MySQL Credential:</b> Select the credential for accessing the MySQL database. You need to add the credential to the MgC Agent and synchronize it to MgC. For details, see <a href="#">Adding Resource Credentials</a>.</li><li>– <b>MySQL Node IP Address:</b> Enter the IP address of the MySQL database server.</li><li>– <b>MySQL Port:</b> Enter the port of the MySQL database service.</li><li>– <b>Database Name:</b> Enter the name of the database that stores the Hive table metadata.</li></ul></li></ul> <p><b>NOTE</b><br/>Ensure that the entered MySQL credential, node IP address, service port, and database name match the MySQL database used by Hive. Otherwise, data verification will fail.</p> |

**Table 1-25** Parameters for creating a connection to Doris

| Parameter           | Configuration                                                                                                                                                |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To       | Configure this parameter based on requirements.                                                                                                              |
| Connection Name     | The default name is <b>Doris-4 random characters</b> (including letters and numbers). You can also customize a name.                                         |
| MgC Agent           | Select the <b>MgC Agent</b> installed in the source environment.                                                                                             |
| Doris Credential    | Select the Doris credential added to the MgC Agent. For details about how to add credentials, see "Big data - Doris" in <b>Adding Resource Credentials</b> . |
| Database IP Address | Enter the IP address for accessing the Doris cluster.                                                                                                        |
| Database Port       | Enter the port used for accessing the Doris cluster. The default value is 3306.                                                                              |
| Database Name       | Enter the name of the Doris database.                                                                                                                        |



| Parameter             | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collect Usage Metrics | <p>This parameter is optional. If this option is enabled, usage metrics for your big data resources will be collected during the execution of tasks created using this connection. The collected information is used to generate reports on the MgC console and for performance optimization.</p> <p><b>NOTICE</b></p> <p>Before using this function, ensure that the Huawei Cloud account you added to the MgC Agent has the read-only permission for MRS and DLI.</p> <ul style="list-style-type: none"> <li>● If the selected credential is the one you currently use to access MgC, you can select <b>This is my MgC credential</b>, and the projects in the region you choose will be listed. <ul style="list-style-type: none"> <li>- Under <b>Region</b>, select the region where the data to be verified is located.</li> <li>- Under <b>Project</b>, select the project where the data to be verified is stored.</li> <li>- Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> <li>● If the selected Doris credential is not the one you currently use to access MgC: <ul style="list-style-type: none"> <li>- Under <b>Region ID</b>, enter the ID of the region where the data to be verified is located. For example, if the region is CN South-Guangzhou, enter <b>cn-south-1</b>.</li> <li>- Under <b>Project ID</b>, enter the project ID corresponding to the region.</li> <li>- Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>● To view the region ID and project ID, choose <b>My Credentials &gt; API Credentials</b>.</li> <li>● For details about how to obtain the cluster ID, see <a href="#">Obtaining an MRS Cluster ID</a>.</li> </ul> |

**Table 1-26** Parameters for creating a connection to HBase

| Parameter       | Configuration                                                                                                        |
|-----------------|----------------------------------------------------------------------------------------------------------------------|
| Connection To   | Configure this parameter based on requirements.                                                                      |
| Connection Name | The default name is <b>HBase-4 random characters</b> (including letters and numbers). You can also customize a name. |

| Parameter                 | Configuration                                                                                                                                                                                                                                                                                                              |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MgC Agent                 | Select the <b>MgC Agent</b> installed in the source environment.<br><b>CAUTION</b><br>You need to configure <b>/etc/hosts</b> on the server where the MgC Agent is installed, so the HBase metadata connection can be established. For more information, see <b>Preparing for Development and Operating Environments</b> . |
| HBase Credential          | Select the HBase credential added to the MgC Agent. For details about how to add credentials, see "Big data - HBase" in <b>Adding Resource Credentials</b> .                                                                                                                                                               |
| Secured Cluster           | Choose whether the cluster is secured.                                                                                                                                                                                                                                                                                     |
| ZooKeeper IP Address      | Enter the IP address for connecting to the ZooKeeper node. You can enter the public or private IP address of the ZooKeeper node.                                                                                                                                                                                           |
| ZooKeeper Connection Port | Enter the port for connecting to the ZooKeeper node.                                                                                                                                                                                                                                                                       |
| HBase Version             | Select the HBase version.                                                                                                                                                                                                                                                                                                  |

**Table 1-27** Parameters for creating a connection to ClickHouse

| Parameter                        | Configuration                                                                                                                                                          |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To                    | Configure this parameter based on requirements.                                                                                                                        |
| Connection Name                  | The default name is <b>ClickHouse-4 random characters</b> (including letters and numbers). You can also customize a name.                                              |
| MgC Agent                        | Select the <b>MgC Agent</b> installed in the source environment.                                                                                                       |
| ClickHouse Credential (Optional) | Select the ClickHouse credential added to the MgC Agent. For details about how to add credentials, see "Big data - ClickHouse" in <b>Adding Resource Credentials</b> . |
| Secured Cluster                  | Choose whether the cluster is secured.                                                                                                                                 |
| ClickHouse IP Address            | Enter the IP address of the server that hosts ClickHouse.                                                                                                              |
| HTTP Port                        | If the ClickHouse cluster is unsecured, enter the HTTP port for communicating with the ClickHouse server. The default value is 8123.                                   |
| HTTP SSL/TLS Port                | If the ClickHouse cluster is secured, enter the HTTPS port for communicating with the ClickHouse server.                                                               |

**Table 1-28** Parameters for creating a connection to Delta Lake (with metadata)

| Parameter                    | Configuration                                                                                                                                                                                                                                                                                        |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To                | You only need to create a metadata connection to the source.                                                                                                                                                                                                                                         |
| Connection Name              | The default name is <b>Delta-Lake-with-metadata-4 random characters</b> (including letters and numbers). You can also customize a name.                                                                                                                                                              |
| MgC Agent                    | Select the <b>MgC Agent</b> installed in the source environment.                                                                                                                                                                                                                                     |
| Executor Credential          | Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in <a href="#">Adding Resource Credentials</a> .                                                                                                                                    |
| Executor IP Address          | Enter the IP address for connecting to the executor.                                                                                                                                                                                                                                                 |
| Executor Port                | Enter the port for connecting to the executor.                                                                                                                                                                                                                                                       |
| Spark Client Directory       | Enter the installation directory of the Spark client.                                                                                                                                                                                                                                                |
| Environment Variable Address | Enter the absolute path of the environment variable file (configuration file), for example, <b>/opt/bigdata/client/bigdata_env</b> .                                                                                                                                                                 |
| SQL File Location            | Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory.<br><b>NOTICE</b><br>After the migration is complete, you need to manually clear the folders generated at this location to release storage space. |

**Table 1-29** Parameters for creating a connection to Delta Lake (without metadata)

| Parameter           | Configuration                                                                                                                                                     |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To       | You only need to create a metadata connection to the source.                                                                                                      |
| Connection Name     | The default name is <b>Delta-Lake-without-metadata-4 random characters</b> (including letters and numbers). You can also customize a name.                        |
| MgC Agent           | Select the <b>MgC Agent</b> installed in the source environment.                                                                                                  |
| Executor Credential | Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in <a href="#">Adding Resource Credentials</a> . |

| Parameter                    | Configuration                                                                                                                                                                                                                                                                                                    |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Executor IP Address          | Enter the IP address for connecting to the executor.                                                                                                                                                                                                                                                             |
| Executor Port                | Enter the port for connecting to the executor.                                                                                                                                                                                                                                                                   |
| Spark Client Directory       | Enter the installation directory of the Spark client.                                                                                                                                                                                                                                                            |
| Environment Variable Address | Enter the absolute path of the environment variable file (configuration file), for example, <b>/opt/bigdata/client/bigdata_env</b> .                                                                                                                                                                             |
| SQL File Location            | <p>Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory.</p> <p><b>NOTICE</b><br/>After the migration is complete, you need to manually clear the folders generated at this location to release storage space.</p> |

| Parameter             | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collect Usage Metrics | <p>This parameter is optional. If this option is enabled, usage metrics for your big data resources will be collected during the execution of tasks created using this connection. The collected information is used to generate reports on the MgC console and for performance optimization.</p> <p><b>NOTICE</b></p> <p>Before using this function, ensure that the Huawei Cloud account you added to the MgC Agent has the read-only permission for MRS and DLI.</p> <ul style="list-style-type: none"> <li>• If the selected credential is the one you currently use to access MgC, you can select <b>This is my MgC credential</b>, and the projects in the region you choose will be listed. <ul style="list-style-type: none"> <li>– Under <b>Region</b>, select the region where the data to be verified is located.</li> <li>– Under <b>Project</b>, select the project where the data to be verified is stored.</li> <li>– Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> <li>• If the selected Doris credential is not the one you currently use to access MgC: <ul style="list-style-type: none"> <li>– Under <b>Region ID</b>, enter the ID of the region where the data to be verified is located. For example, if the region is CN South-Guangzhou, enter <b>cn-south-1</b>.</li> <li>– Under <b>Project ID</b>, enter the project ID corresponding to the region.</li> <li>– Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• To view the region ID and project ID, choose <b>My Credentials &gt; API Credentials</b>.</li> <li>• For details about how to obtain the cluster ID, see <a href="#">Obtaining an MRS Cluster ID</a>.</li> </ul> |

**Table 1-30** Parameters for creating a connection to Hudi (with metadata)

| Parameter       | Configuration                                                                                                                     |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Connection To   | You only need to create a metadata connection to the source.                                                                      |
| Connection Name | The default name is <b>Hudi-with-metadata-4 random characters</b> (including letters and numbers). You can also customize a name. |

| Parameter                    | Configuration                                                                                                                                                                                                                                                                                        |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MgC Agent                    | Select the <b>MgC Agent</b> installed in the source environment.                                                                                                                                                                                                                                     |
| Executor Credential          | Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in <b>Adding Resource Credentials</b> .                                                                                                                                             |
| Executor IP Address          | Enter the IP address for connecting to the executor.                                                                                                                                                                                                                                                 |
| Executor Port                | Enter the port for connecting to the executor.                                                                                                                                                                                                                                                       |
| Spark Client Directory       | Enter the installation directory of the Spark client.                                                                                                                                                                                                                                                |
| Environment Variable Address | Enter the absolute path of the environment variable file (configuration file), for example, <b>/opt/bigdata/client/bigdata_env</b> .                                                                                                                                                                 |
| SQL File Location            | Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory.<br><b>NOTICE</b><br>After the migration is complete, you need to manually clear the folders generated at this location to release storage space. |

**Table 1-31** Parameters for creating a connection to Hudi (without metadata)

| Parameter                    | Configuration                                                                                                                                            |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To                | You only need to create a metadata connection to the source.                                                                                             |
| Connection Name              | The default name is <b>Hudi-without-metadata-4 random characters</b> (including letters and numbers). You can also customize a name.                     |
| MgC Agent                    | Select the <b>MgC Agent</b> installed in the source environment.                                                                                         |
| Executor Credential          | Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in <b>Adding Resource Credentials</b> . |
| Executor IP Address          | Enter the IP address for connecting to the executor.                                                                                                     |
| Executor Port                | Enter the port for connecting to the executor.                                                                                                           |
| Spark Client Directory       | Enter the installation directory of the Spark client.                                                                                                    |
| Environment Variable Address | Enter the absolute path of the environment variable file (configuration file), for example, <b>/opt/bigdata/client/bigdata_env</b> .                     |

| Parameter             | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SQL File Location     | <p>Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory.</p> <p><b>NOTICE</b><br/>After the migration is complete, you need to manually clear the folders generated at this location to release storage space.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Collect Usage Metrics | <p>This parameter is optional. If this option is enabled, usage metrics for your big data resources will be collected during the execution of tasks created using this connection. The collected information is used to generate reports on the MgC console and for performance optimization.</p> <p><b>NOTICE</b><br/>Before using this function, ensure that the Huawei Cloud account you added to the MgC Agent has the read-only permission for MRS and DLI.</p> <ul style="list-style-type: none"> <li>● If the selected credential is the one you currently use to access MgC, you can select <b>This is my MgC credential</b>, and the projects in the region you choose will be listed. <ul style="list-style-type: none"> <li>– Under <b>Region</b>, select the region where the data to be verified is located.</li> <li>– Under <b>Project</b>, select the project where the data to be verified is stored.</li> <li>– Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> <li>● If the selected Doris credential is not the one you currently use to access MgC: <ul style="list-style-type: none"> <li>– Under <b>Region ID</b>, enter the ID of the region where the data to be verified is located. For example, if the region is CN South-Guangzhou, enter <b>cn-south-1</b>.</li> <li>– Under <b>Project ID</b>, enter the project ID corresponding to the region.</li> <li>– Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>● To view the region ID and project ID, choose <b>My Credentials</b> &gt; <b>API Credentials</b>.</li> <li>● For details about how to obtain the cluster ID, see <b>Obtaining an MRS Cluster ID</b>.</li> </ul> |

**Table 1-32** Parameters for creating a connection to MaxCompute

| Parameter                | Configuration                                                                                                                                                                   |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To            | You only need to create a metadata connection to the source.                                                                                                                    |
| Connection Name          | The default name is <b>MaxCompute-4 random characters</b> (including letters and numbers). You can also customize a name.                                                       |
| MgC Agent                | Select the <b>MgC Agent</b> installed in the source environment.                                                                                                                |
| Alibaba Cloud Credential | Select the credential of the source Alibaba Cloud account. For details about how to add credentials, see "Big data - MaxCompute" in <b>Adding Resource Credentials</b> .        |
| MaxCompute Project       | Enter the name of the MaxCompute project to be collected. You can obtain the project name from the MaxCompute console.                                                          |
| Endpoint                 | Enter the endpoint of the region where the MaxCompute project is located.<br><br>For details about MaxCompute endpoints in different regions, see <b>MaxCompute Endpoints</b> . |

**Table 1-33** Parameters for creating a connection to ApsaraDB for ClickHouse

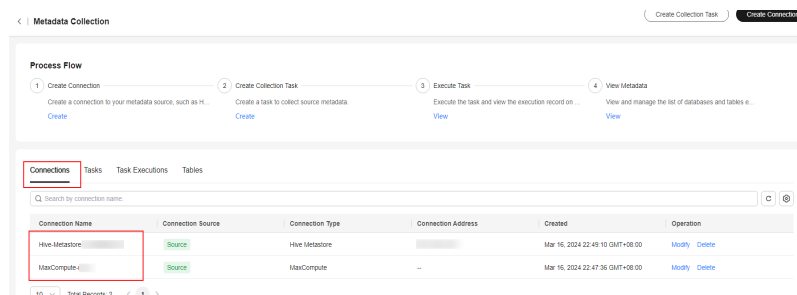
| Parameter             | Configuration                                                                                                                                                                       |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To         | You only need to create a metadata connection to the source.                                                                                                                        |
| Connection Name       | The default name is <b>ApsaraDB for ClickHouse-4 random characters</b> (including letters and numbers). You can also customize a name.                                              |
| MgC Agent             | Select the <b>MgC Agent</b> installed in the source environment.                                                                                                                    |
| ClickHouse Credential | Select the ApsaraDB for ClickHouse credential added to the MgC Agent. For details about how to add credentials, see "Big data - ClickHouse" in <b>Adding Resource Credentials</b> . |
| Database URL          | Enter the public address of the source ClickHouse cluster. You can view the IP address in the cluster details.                                                                      |

**Step 6** Click **Test**. MgC verifies whether the connection can be established using the configuration information. If the test is successful, the connection can be established.



**Step 7** After the connection test is successful, click **Confirm**. The metadata connection is created.

**Step 8** Click **Metadata connections** in the **Metadata Collection** area. On the **Connections** tab, you can view the list of created metadata connections and their basic information. Locate the connection you created and in the **Operation** column, click **Modify** to modify the connection settings.



----End

### 1.6.2.2 Creating a Metadata Collection Task

Use the created metadata connection to create a collection task that gathers the details about source databases, tables, and fields to MgC.

You can create metadata collection tasks for:

- Hive Metastore
- Doris
- HBase
- ClickHouse
- Hudi (with metadata)
- Hudi (without metadata)
- MaxCompute
- ApsaraDB for ClickHouse

You can also add metadata about tables manually or by importing a file. For details, see [Viewing Metadata](#).

### Prerequisites

You have [created a metadata connection](#).

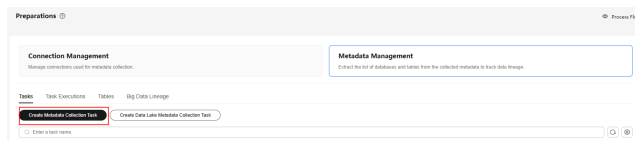
### Procedure

**Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select a [big data migration project](#) from the drop-down list.

**Step 2** In the navigation pane, choose **Survey > Preparations**.

**Step 3** Choose **Metadata Management** and click **Create Metadata Collection Task**.

**Figure 1-37** Create Metadata Collection Task



**Step 4** Set task parameters based on [Table 1-34](#).

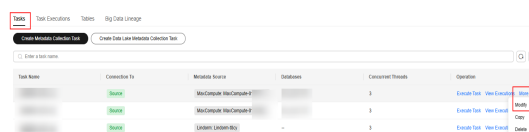
**Table 1-34** Parameters for configuring a metadata collection task

| Parameter           | Configuration                                                                                                                                                                                                                                                                                       |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Task Name           | The default name is <b>Metadata-Collection-4 random characters</b> (including letters and numbers). You can also specify a name.                                                                                                                                                                    |
| Metadata Connection | Select the <b>created metadata connection</b> .                                                                                                                                                                                                                                                     |
| Databases           | Enter the names of the databases whose metadata needs to be collected.<br><b>NOTICE</b><br>This parameter is mandatory only if a <b>MaxCompute</b> metadata connection is selected. In other cases, it is optional. If it is left blank, the metadata of all databases is collected.                |
| Concurrent Threads  | Set the number of concurrent threads for executing the collection. The default value is <b>3</b> . The value ranges from <b>1</b> to <b>10</b> . Configuring more concurrent threads means more efficient collection, but more connection and MgC Agent (formerly Edge) resources will be consumed. |

**Step 5** Click **Confirm**. The metadata collection task is created.

**Step 6** Under **Tasks**, you can review the created metadata collection task and its settings. You can modify the task by choosing **More > Modify** in the **Operation** column.

**Figure 1-38** Managing a metadata collection task



**Step 7** Click **Execute Task** in the **Operation** column to run the task. Each time the task is executed, a task execution is generated.

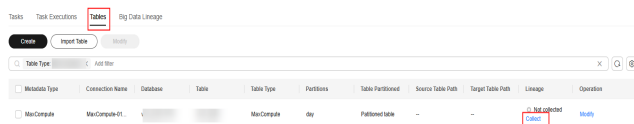
**Step 8** Click **View Executions** in the **Operation** column. Under **Task Executions**, you can view the execution records of the task and the status and collection result of each task execution. When a task execution enters a **Completed** status and the collection results are displayed, you can view the list of databases and tables extracted from collected metadata on the **Tables** tab.

**Figure 1-39** Managing task executions



**Step 9** Locate a table and click **Collect** in the **Lineage** column to **create a lineage collection task**.

**Figure 1-40** Tables



----End

### 1.6.2.3 Creating a Data Lake Metadata Collection Task

Use the created metadata connection to create a collection task that gathers the details about source databases, tables, and fields to MgC. Only Delta lakes with metadata are supported.

For Delta lakes without metadata, you can manually add information about database tables one by one or import them in a batch. For details, see [Viewing Metadata](#).

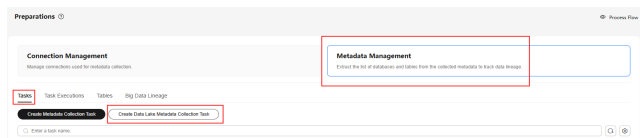
#### Prerequisites

You have [created a connection to Delta Lake \(with metadata\)](#).

#### Procedure

- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select a [big data migration project](#) from the drop-down list.
- Step 2** In the navigation pane, choose **Survey > Preparations**.
- Step 3** Choose **Metadata Management** and click **Create Data Lake Metadata Collection Task**.

**Figure 1-41** Create Data Lake Metadata Collection Task



**Step 4** Set task parameters based on [Table 1-35](#).

**Table 1-35** Parameters for configuring a metadata collection task

| Parameter           | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Task Name           | The default name is <b>Data-Lake-Metadata-Collection-Task-4</b> <i>random characters</i> (including letters and numbers). You can also specify a name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Metadata Connection | Select the created <a href="#">connection to Delta Lake (with metadata)</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Databases           | Enter the names of the databases whose metadata needs to be collected.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Concurrent Threads  | Set the maximum number of threads for executing the collection. The default value is <b>3</b> . The value ranges from <b>1</b> to <b>10</b> . Configuring more concurrent threads means more efficient collection, but more connection and MgC Agent (formerly Edge) resources will be consumed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Custom Parameters   | <p>You can customize parameters to specify the tables and partitions to collect or set criteria to filter tables and partitions.</p> <ul style="list-style-type: none"> <li>• If the metadata source is Alibaba Cloud EMR, add the following parameter: <ul style="list-style-type: none"> <li>- <b>Parameter:</b> <code>conf</code></li> <li>- <b>Value:</b> <code>spark.sql.catalogImplementation=hive</code></li> </ul> </li> <li>• If the source is Alibaba Cloud EMR Delta Lake 2.2 and is accessed through Delta Lake 2.3, add the following parameters: <ul style="list-style-type: none"> <li>- <b>Parameter:</b> <code>master</code></li> <li>- <b>Value:</b> <code>local</code></li> </ul> </li> <li>• If the source is Alibaba Cloud EMR Delta Lake 2.1.0 and Spark 2.4.8 is configured to process Delta Lake data, add the following parameters: <ul style="list-style-type: none"> <li>- Parameter: <code>mgc.delta.spark.version</code></li> <li>- Value: <code>2</code></li> </ul> </li> <li>• If the source is Alibaba Cloud EMR and Spark 3 is configured to process Delta Lake data, add the following parameters: <ul style="list-style-type: none"> <li>- Parameter: <code>jars</code></li> <li>- <b>Value:</b> <code>'/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-core_2.12-*.jar,/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-storage-*.jar'</code></li> </ul> </li> </ul> <p><b>CAUTION</b><br/>Replace the parameter values with the actual environment directory and Delta Lake version.</p> |

**Step 5** Click **Confirm**. The metadata collection task is created.

**Step 6** Under **Tasks**, you can review the created metadata collection task and its settings. You can modify the task by choosing **More > Modify** in the **Operation** column.

- Step 7** Click **Execute Task** in the **Operation** column to run the task. Each time the task is executed, a task execution is generated.
  - Step 8** Click **View Executions** in the **Operation** column. Under **Task Executions**, you can view the execution records of the task and the status and collection results of each task execution. When a task execution enters a **Completed** status and the collection results are displayed, you can view the list of databases and tables extracted from collected metadata on the **Tables** tab.
  - Step 9** Locate a table and click **Collect** in the **Lineage** column to [create a lineage collection task](#).
- End

### 1.6.2.4 Viewing Metadata

You can collect metadata about databases and tables by creating a collection task or manually adding or importing metadata to MgC.

### Creating a Collection Task

For details about how to create a collection task, see [Creating a Metadata Collection Task](#). When a task execution enters a **Completed** status and the collection results are displayed, you can view the list of databases and tables extracted from collected metadata on the **Tables** tab.

### Manually Adding a Table

- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select a [big data migration project](#) from the drop-down list.
- Step 2** In the navigation pane, choose **Survey > Preparations**.
- Step 3** Choose **Metadata Management** and click the **Tables** tab.
- Step 4** On the displayed page, click **Add**.
- Step 5** Configure the parameters listed in [Table 1-36](#).

**Table 1-36** Parameters for adding a table

| Parameter           | Description                                              |
|---------------------|----------------------------------------------------------|
| Metadata Connection | Select the <a href="#">created metadata connection</a> . |
| Database            | Enter a name.                                            |
| Table               | Enter a name.                                            |

| Parameter                                                                                                                                          | Description                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Source Table Path<br>(Optional)<br>It is mandatory only if a Delta Lake connection is selected for <b>Metadata Connection</b> .                    | Enter the path for storing the data table in the source database.                                                |
| Target Table Path<br>(Optional)<br>It is mandatory only if a Delta Lake connection (without metadata) is selected for <b>Metadata Connection</b> . | Enter the path for storing the data table in the target database.                                                |
| Partition Info<br>(Optional)                                                                                                                       | User-defined                                                                                                     |
| Is Partitioned<br>(Optional)                                                                                                                       | Specify whether the table is partitioned.                                                                        |
| Business Owner<br>(Optional)                                                                                                                       | You can specify the owner of the business that the data table belongs to.                                        |
| Analysis Owner<br>(Optional)                                                                                                                       | Specify the analysis owner of the table.                                                                         |
| External                                                                                                                                           | Set it as required. If the table is external, the consistency verification result of the table is not displayed. |
| Description<br>(Optional)                                                                                                                          | Enter a table description.                                                                                       |

**Step 6** Click **Confirm**. Then you can view the table in the table list.

----End

## Importing Tables

**Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select a **big data migration project** from the drop-down list.

**Step 2** In the navigation pane, choose **Survey > Preparations**.

**Step 3** Choose **Metadata Management** and click the **Tables** tab.

**Step 4** On the displayed page, click **Import**.

**Step 5** Select the **created metadata connection**.

- Step 6** Click **Download** to download the import template to the local PC. Open the import template and fill in the template with the information of the tables to be added.

**NOTICE**

- A maximum of 10,000 tables can be imported at a time.
- The tables to be imported must come from the same metadata source.
- If a connection to Delta Lake (with metadata) is selected for **Metadata Connection**, the **source\_path** parameter in the template is mandatory.
- If a connection to Delta Lake (without metadata) is selected for **Metadata Connection**, the **source\_path** and **target\_path** parameters in the template are mandatory.

- Step 7** Go back to the console and click **Select File** to upload the populated template to MgC.

- Step 8** Click **Confirm**. The system starts the import. A task execution record is generated for this import. The execution status represents the import status.

----End

## 1.6.3 Collecting Data Lineage

### 1.6.3.1 Overview

Collecting data lineage can capture relationships and dependencies between data elements. MgC can virtualize the collected data lineage into graphs.

The following describes the types of jobs data lineage can be collected from and the collection precautions.

| Job Type             | Collection Precaution                                                                                                                                     |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| DataArts Studio jobs | You need to <a href="#">export DataArts Studio jobs</a> to an OBS bucket on Huawei Cloud and assign the read and write permissions for the bucket to MgC. |
| SQL jobs             | You need to export SQL jobs and upload them an OBS bucket on Huawei Cloud and assign the read and write permissions for the bucket to MgC.                |
| Lineage template     | You need to download the lineage template and fill it with your data.                                                                                     |

### 1.6.3.2 Exporting Jobs

This section describes how to export data jobs from Huawei Cloud DataArts Studio and Alibaba Cloud DataWorks.

## Exporting Jobs from Huawei Cloud DataArts Studio

**Step 1** Sign in to the **DataArts Studio** console.

**Step 2** Select your instance, click **Access**, and locate the desired workspace.

### Available Instances

| Enterprise Project: default |                                 |                   |                        |
|-----------------------------|---------------------------------|-------------------|------------------------|
| Version                     | Free                            | Billing Mode      | Yearly/Monthly         |
| Created                     | Dec 15, 2023 11:21:57 GMT+08:00 | Name              | DataArts-default       |
| Expires                     | Mar 15, 2024 23:59:59 GMT+08:00 | Instance ID       |                        |
| Order No.                   | C                               | Status            | 11 days until expirati |
| Description                 | — <a href="#">✎</a>             | Expiration Policy | Auto-Renew             |

[Access](#) | [Renew](#) | [Buy](#) | [More](#) ▾

**Step 3** Choose **DataArts Factory**.

**DataArts-default** [Back to Instance List](#)

[Dashboard](#) | [Workspaces](#) | [Roles](#) | [Industry Ass](#)

### Workspace

Mar 28, 2024 11:38:21 GMT+08:00

1 member

- [DataArts Migration](#)
- [DataArts Architecture](#)
- [DataArts Factory](#)
- [DataArts Quality](#)
- [DataArts Catalog](#)
- [DataArts Security](#)
- [Management Center](#)
- [DataArts DataService](#)
- [DataArts Insight](#)

**Step 4** Click  in the job directory and choose **Show Check Box**.

Jobs(6)

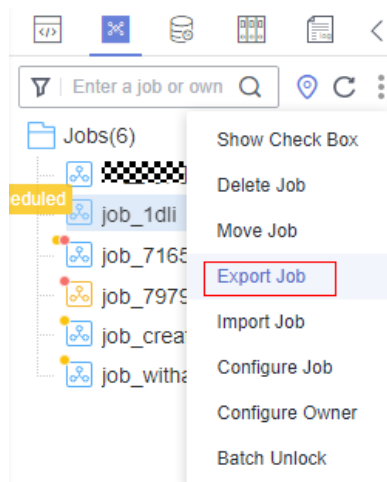
- [job\\_1dli](#)
- [job\\_7165](#)
- [job\\_7979](#)
- [job\\_crea](#)
- [job\\_wit](#)

[Show Check Box](#)

- Delete Job
- Move Job
- Export Job
- Import Job
- Configure Job
- Configure Owner
- Batch Unlock

**Step 5** Select the jobs to be exported, click , and choose **Export Job**.





**Step 6** Set **Export Mode** to **To OBS** and select a path for saving the jobs.

**Step 7** Set **Export Scope** and **Job Status** as required.

#### NOTICE


If the job to be exported has not been submitted for any version, you are advised to set **Export Status** to **Developed**. If **Export Status** is set to **Submitted**, the job will be skipped during the export.

**Step 8** Click **OK**. After the export is complete, go to the OBS directory selected in step 6 to obtain the exported package.

----End

## Exporting Jobs from Alibaba Cloud DataWorks

**Step 1** Sign in to the Alibaba Cloud DataWorks console. In the left navigation pane, choose **Data Modeling and Development > DataStudio**. On the displayed page, select the desired workspace from the drop-down list, and click **Go to DataStudio**.

**Step 2** Click the  icon in the upper left corner and choose **All Products > More > Migration Assistant**.

**Step 3** Create a full export task. For details, see [Creating and Viewing DataWorks Export Tasks](#).

----End

### 1.6.3.3 Creating a Lineage Collection Task

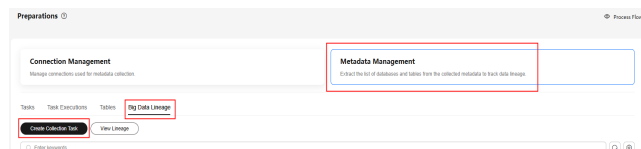
#### Prerequisites

You have [collected metadata](#).

## Procedure

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select a **big data migration project** from the drop-down list.
- Step 2** In the navigation pane, choose **Survey > Preparations**.
- Step 3** Choose **Metadata Management**. Under the **Big Data Lineage** tab, click **Create Collection Task**.

**Figure 1-42** Creating a lineage collection task



- Step 4** Select a job type and configure the parameters shown.

| Type             | Parameter | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lineage template | File      | <p>Download the lineage template to the local PC and set parameters in the template. The following fields are mandatory:</p> <ul style="list-style-type: none"> <li>• Target Database (TargetDataset)</li> <li>• Target Table (TargetTable)</li> <li>• Target Connection Name (TargetConnectionName)</li> <li>• Target Component Type (TargetComponentType)</li> <li>• Upstream Database (SourceDataset)</li> <li>• Upstream Table (SourceTable)</li> <li>• Upstream Connection Name (SourceConnectionName)</li> <li>• Upstream Component Type (SourceComponentType)</li> <li>• Job ID (JobId)</li> </ul> <p><b>NOTICE</b></p> <ul style="list-style-type: none"> <li>• The value of <b>Target Component Type</b> and <b>Upstream Component Type</b> in the template can be <b>Hive SQL</b> or <b>MaxCompute</b>.</li> <li>• Cells in the template cannot contain formulas. Otherwise, the parsing will fail.</li> </ul> <p>Go back to the console and click <b>Select File</b> to upload the saved file to MgC.</p> <p><b>CAUTION</b><br/>The file size cannot exceed 100 MB.</p> |

- **Lineage template.**

- a. Click **Download Template** to download the template to the local PC.
- b. Complete the lineage template. The following parameters are mandatory:
  - Target Database (TargetDataset)
  - Target Table (TargetTable)
  - Target Connection Name (TargetConnectionName)
  - Target Component Type (TargetComponentType)
  - Upstream Database (SourceDataset)
  - Upstream Table (SourceTable)
  - Upstream Connection Name (SourceConnectionName)
  - Upstream Component Type (SourceComponentType)
  - Job ID (JobId)

---

**NOTICE**

- The value of **Target Component Type** and **Upstream Component Type** in the template can be **Hive SQL** or **MaxCompute**.
  - Cells in the template cannot contain formulas. Otherwise, the parsing will fail.
- 
- c. Go back to the console and click **Select File** to upload the saved file to MgC.

---

 **CAUTION**

The file size cannot exceed 100 MB.

---

- Step 5** Click **Confirm**. The data lineage collection task is created. The system automatically starts collecting data lineage.
- Step 6** Click **View Tasks**. On the displayed page, you can view the collection task in the task list.
- Step 7** Wait until the task status changes to **Completed**. Then click **View Lineage** in the upper right corner of the page to view the [Lineage Graph](#).

----End

### 1.6.3.4 Viewing Data Lineage

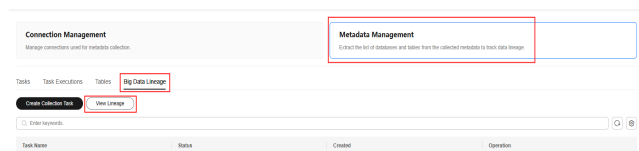
#### Prerequisites

A [lineage collection task](#) has been completed.

## Procedure

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select a **big data migration project** from the drop-down list.
- Step 2** In the navigation pane, choose **Survey > Preparations**.
- Step 3** Choose **Metadata Management**. On the **Big Data Lineage** tab, click **View Lineage**.

Figure 1-43 View Lineage



- Step 4** On the displayed page, view the lineage graph by database and table. If big data verification is performed, you can also filter data by verification batch.

----End

## 1.7 Migration Solutions

### 1.7.1 Associating Source Servers with Target Servers

You can associate source servers with existing servers on Huawei Cloud. Then your workloads can be migrated to these Huawei Cloud servers.

For source servers with target servers associated, there is no need to **assess** them before you create workflows to execute migrations.

#### Prerequisites

You have finished **resource discovery**.

#### Notes

A target server must meet the following requirements:

- The target server must be stopped.
- During the migration, disks on the target server are formatted and re-partitioned based on the source disk settings for receiving data migrated from the source server.
- To migrate over the Internet, the target server must be able to access the Internet.
- The target server must be in the same region as the **application** to which the source server is added.

## Procedure

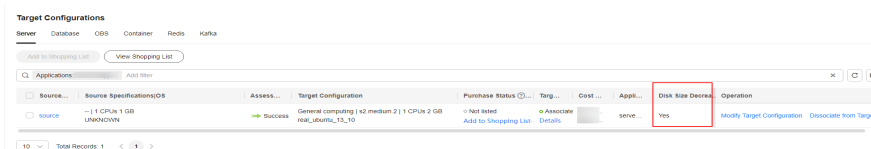
- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select an **application migration project** from the drop-down list.

- Step 2** In the navigation pane on the left, choose **Design > Migration Solutions**.
- Step 3** Click **View** in the **Target Configuration** card.
- Step 4** On the displayed **Servers** tab, locate a source server and click **Associate** in the **Target Association** column.
- Step 5** In the displayed dialog box, select the region of the **application** and select a project. You can select a target server based on the disk usage of the source server. This allows you to choose a target server with a smaller disk capacity or fewer disks than the source server, reducing disk capacity, optimizing resource utilization, and avoiding unnecessary costs.

### NOTICE

- Disk downsizing is only available for Linux, and the decreased sizes must be larger than the used sizes of the source disks.
- In the cross-AZ migration scenario, only disk upsizing is supported. Even if you choose to downsize disks here, the settings will not be applied, and the system will create target disks as large as source disks.

- Step 6** Click **OK**. After the association is complete, **Associated** appears in the **Target Association** column. You can click **Details** to view the specifications of the associated target server. The system will automatically check whether the associated target server has downsized disks compared with the source server. If it does, **Yes** will be displayed in the **Disk Size Decreased** column. If it does not, **No** will be displayed.



----End

## Dissociating a Source Server from the Target Server

- Step 1** On the **Servers** tab, locate the source server and click **Dissociate from Target** in the **Operation** column.
- Step 2** In the displayed dialog box, click **Yes**. Please note that this operation cannot be undone.

----End

## 1.7.2 Getting Target Recommendations

Assessing an application can generate recommendations for rightsized Huawei Cloud resources based on the specifications, performance, and business purpose of the source resources added to the application. These recommendations also take into account your requirements for cost, availability, and compliance.

Target recommendations can be generated for servers, databases, object storage, containers, and middleware.

## Notes and Constraints

- If your source servers have been **associated with existing servers** on Huawei Cloud, you can skip this section and directly create a migration workflow to migrate them.
- The validity period of target recommendations is three months.

## Prerequisites

You have **discovered resources**, and **grouped the resources as applications**.

## Procedure

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select an **application migration project** from the drop-down list.
- Step 2** In the navigation pane on the left, choose **Design > Migration Solutions**.  
On the **Migration Solutions** page, you can view how many source resources and applications are managed in the current migration project, as well as whether the source resources have been configured with target resources.
- Step 3** Click **Assess** in the **Target Configuration** card.
- Step 4** In the **Select Application** drop-down list, select the application you want to assess.
- Step 5** In the **Select Resources** area, select the application resources to be assessed.
- Step 6** Configure the policy used to compute target recommendations based on **Table 1-37**.

**Table 1-37** Settings used for computing target recommendations

| Parameter     | Description                                                                                                                                                                       |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Target Region | Select the region where you want to purchase resources on Huawei Cloud. You are advised to select a region close to your target users for lower network latency and quick access. |

| Parameter         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Assessment Policy | <ul style="list-style-type: none"> <li>● Match source configuration<br/>MgC recommends the right Huawei Cloud resources based on source resource specifications.</li> <li>● Match business scenario<br/>MgC recommends the right Huawei Cloud resources based on the business scenario of source resources and Huawei Cloud best practices.</li> <li>● Cross-AZ migration<br/>This policy only applies to migration of ECSs between AZs on Huawei Cloud, and MgC only assesses servers in the application. You need to select the target AZ you want to migrate to.</li> </ul> <p>For details about how the system recommends appropriate target resources, see <a href="#">How Does MgC Generate Target Recommendations?</a></p> |
| Priority          | <ul style="list-style-type: none"> <li>● High performance<br/>MgC recommends target resources with optimal performance.</li> <li>● Low cost<br/>MgC recommends the most cost-effective target resources that meet your demands.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Parameter   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Preferences | <p>Configure your preferences for target servers. Your preferences will be first attempted to be matched during the assessment. For details about how the system recommends appropriate target resources, see <a href="#">How Does MgC Generate Target Recommendations?</a></p> <ul style="list-style-type: none"> <li>• <b>Server Types (Optional)</b><br/>Select the server types you prefer.</li> <li>• <b>Server Series (Optional)</b><br/>Select the server series you prefer. The system will generate recommendations based on your preferred server types and series.</li> </ul> <p><b>NOTICE</b><br/>If you select <b>Display only series allowed on DeHs</b>, <b>Server Types</b> will be dimmed, and the server series allowed on DeHs in the target region will be listed.</p> <ul style="list-style-type: none"> <li>• <b>System Disk (Optional)</b><br/>Select the system disk type you prefer.</li> <li>• <b>Data Disk (Optional)</b><br/>Select the data disk type you prefer.</li> <li>• <b>Sizing Criteria</b><br/>Choose the criteria that the system will use to generate server recommendations. <ul style="list-style-type: none"> <li>- If you select <b>As-in on source</b>, the system will recommend target servers with the same or as close CPU and memory capacity as the source servers.</li> <li>- If you select <b>Performance-based</b>, you need to perform a <a href="#">performance collection</a> for the source servers, and then set assessment parameters. The system will then recommend target servers with your desired CPU and memory capacity.</li> </ul> </li> </ul> <p><b>NOTICE</b><br/>The more performance data is collected, the more accurate the recommendations are. The collection of server performance data should take no less than seven days.</p> |
|             | <p>For the container assessment, configure parameters such as <b>Cluster Type</b>, <b>Cluster Version</b>, and <b>Container Network Model</b> for getting recommendations for container resources.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

**Step 7** Click **Create Assessment**. After the assessment is complete, you can [review the target recommendations](#). You can also [view the performance data of source servers](#).

**Step 8** (Optional) Perform the following operations:

- [Modify target recommendations](#). You can modify the recommended specifications for target servers and their disks.



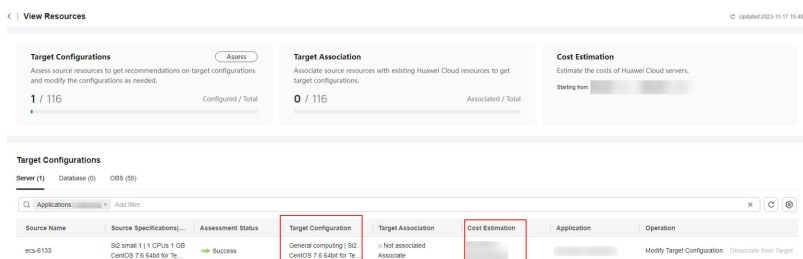
- **Associate source servers with target servers.** If you find that you already have servers that match your requirements on Huawei Cloud based on the target server recommendations, you can associate them with source servers.
- **Associate source servers with DeHs** if you want to migrate to Huawei Cloud DeH.

----End

## Viewing Target Recommendations

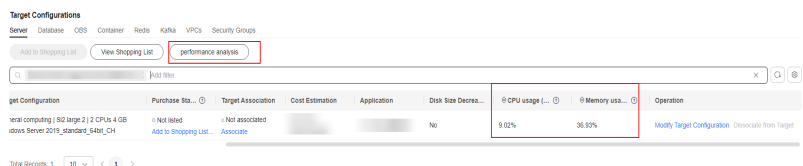
In the application list on the **Migration Solutions** page, click **View Target Configurations** in the **Operation** column.

In the **Target Configurations** area, you can view the specifications of Huawei Cloud resources recommended based on the source resource specifications and your preferences. It also gives you the ability to estimate what it will cost to run your services on Huawei Cloud.



## Viewing Server Performance Data

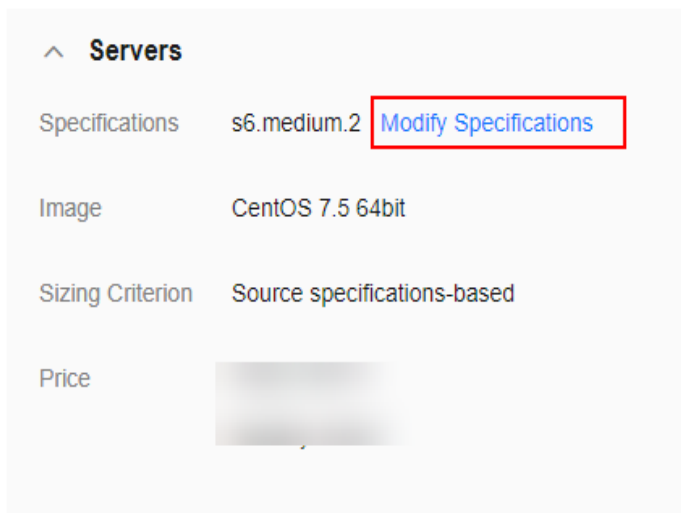
On the **Target Configurations** page, in the server list, you can view the average CPU and memory usage of each server over the last 7 or 30 days. Click **Performance Analysis** to view the performance statistics of all servers.



## Modifying Target Recommendations

- Step 1** In the **Target Configurations** area, locate the server that you want to modify the recommended target configurations for and click **Modify Target Configuration** in the **Operation** column.
- Step 2** Modify the specifications and image for the target server.

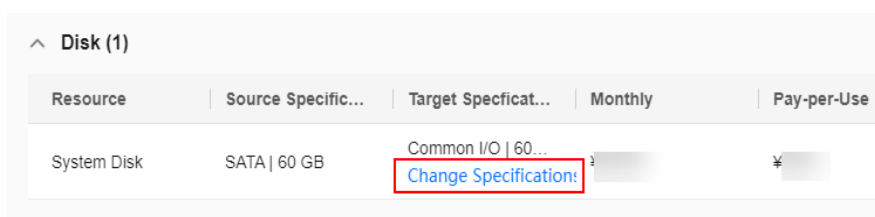
### Target Configuration



**Step 3** In the disk area, locate a disk and click **Modify Specifications** in the **Target Specifications** column. You can modify the disk type and capacity. You can downsize disks for Linux target servers based on the disk usage of the source servers. If you downsize a disk for the target server, the system will set **Disk Downscaled** to **Yes**. The reverse also applies.

#### NOTICE

- The system disk capacity ranges from 40 GB to 1,024 GB.
- The data disk capacity ranges from 10 GB to 32,768 GB.
- Disk downsizing is only available for Linux, and the decreased sizes must be larger than the used sizes of the source disks.
- In the cross-AZ migration scenario, only disk upsizing is supported. Even if you choose to downsize disks here, the settings will not be applied, and the system will create target disks as large as source disks.



----End

## Associating Source Servers with DeHs

After you associate source servers with DeHs, the system will automatically provision the recommended target servers on the DeHs if you:

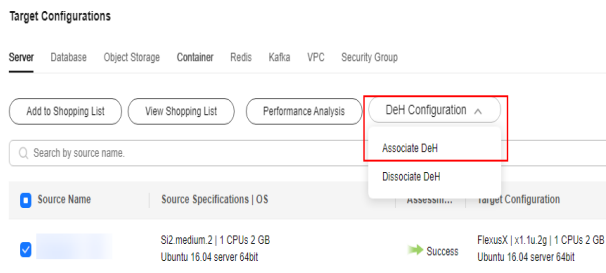
- Buy these recommended target servers using a shopping list.

- Create migration workflows to migrate these source servers.

**Step 1** In the **Target Configurations** area, under **Server**, select the source server to be associated with the same DeH.

**Step 2** Choose **DeH Configuration > Associate DeH** above the list.

**Figure 1-44** Associating source servers with a DeH



**Step 3** Select the target DeH to be associated from the drop-down list and click **Confirm**. **Associated** will show up in the **DeH** column. You can click **Details** to view the associated DeH.

----End

## 1.7.3 Purchasing Resources

After the specifications of target resources are confirmed, you can directly purchase these target resources in batches using a shopping list on MgC. Currently, only servers can be purchased this way. The purchased target servers will be automatically associated with the paired source servers. You can then manually redeploy your services on these target servers. Alternatively, you can create server migration workflows from the beginning to automate the entire purchase and service migration process.

### Prerequisites

You have [got target recommendations](#).

### Procedure

- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select an [application migration project](#) from the drop-down list.
- Step 2** In the navigation pane on the left, choose **Design > Migration Solutions**.
- Step 3** Click **View** in the **Target Configuration** card.
- Step 4** In the **Target Configurations** area, under **Server**, select a server whose **Assessment Status** is **Success**, and click **Add to Shopping List** in the **Purchase Status** column.
- Step 5** On the top of the page, click **View** in the **Shopping List** card.
- Step 6** In the **Process Flow** area, click **View Templates**. In the **My Templates** window that is displayed on the right, click **Create Template**.

- Step 7** In the **Basic Info** area, select a template type (only server is supported currently) and specify a template name. In the **Configuration Info** area, set template parameters based on [Table 1-38](#).

**Table 1-38** Parameters for configuring a shopping template

| Parameter          | Configuration                                                                                                                                                                                                                                                                                                                                                   |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Region             | Select the region where you want to deploy target servers.                                                                                                                                                                                                                                                                                                      |
| Project            | Select a project in the target region.                                                                                                                                                                                                                                                                                                                          |
| AZ                 | <b>Random</b> is the default setting. You can also select an AZ.                                                                                                                                                                                                                                                                                                |
| VPC                | Select a VPC in the target region.                                                                                                                                                                                                                                                                                                                              |
| Subnet             | Select a VPC subnet. The subnet CIDR block must be within the selected VPC CIDR block.                                                                                                                                                                                                                                                                          |
| Security Group     | Select a security group that meet the following requirements: <ul style="list-style-type: none"><li>• Inbound ports 8899, 8900, and 22 are allowed for Windows migrations.</li><li>• Inbound port 22 is allowed for Linux migrations</li></ul>                                                                                                                  |
| Enterprise Project | Select a commercial enterprise project that you want add purchased target servers to. The default enterprise project is <b>default</b> .<br>An enterprise project makes it easy to manage projects and group cloud resources and users. For details about creating and managing enterprise projects, see the <a href="#">Enterprise Management User Guide</a> . |

- Step 8** Click **Save**. You can view the created template in the template list.
- Step 9** Return to the shopping list page, and click **Attach Shopping Template** in the **Shopping Template** column. In the displayed dialog box, select the created template from the drop-down list and click **Confirm**.
- Step 10** Click **Buy** in the **Operation** column. Wait until the purchase status changes to **Purchased**, and view the ID of the purchased resource.

----End

## 1.7.4 Assessing Migration Risks

You can assess potential migration risks before performing a migration. The assessment results will indicate whether your source servers are compatible with the target cloud in terms of OS, firmware, and specifications.

---

### NOTICE

Only servers can be assessed for migration risks.

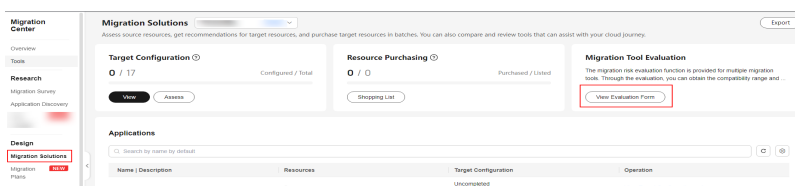
---

## Prerequisites

You have added source server information to MgC manually or through an Internet- or intranet- based discovery task.

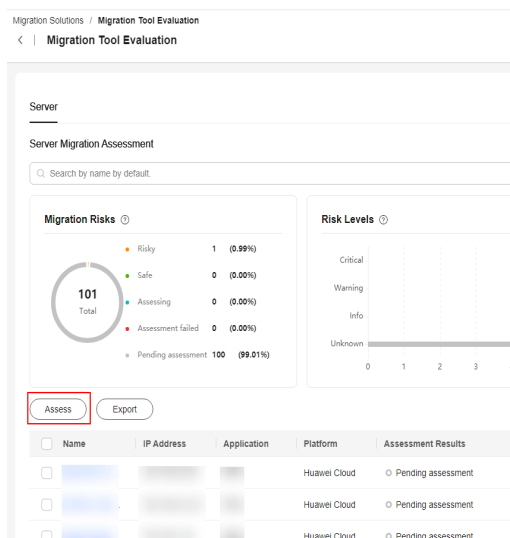
## Procedure

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select an **application migration project** from the drop-down list.
- Step 2** In the navigation pane on the left, choose **Design > Migration Solutions**.
- Step 3** Click **View Evaluation List** in the **Migration Tool Evaluation** card.

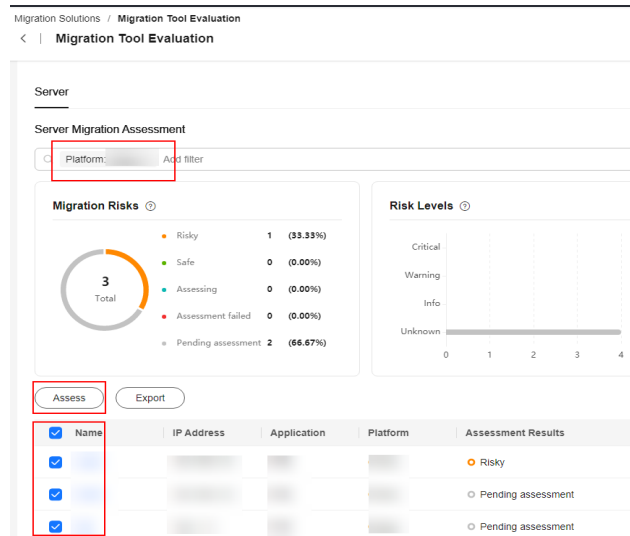


- Step 4** On the **Server** tab, you can view the list of all source servers.

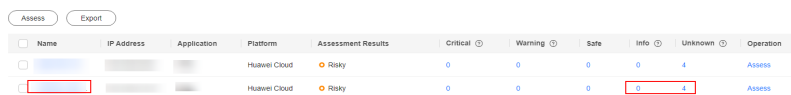
- To assess all servers in the **Pending assessment** state, click **Assess**. In the dialog box that is displayed, click **OK**.



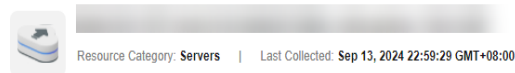
- To assess certain servers, search for them by name, IP address, platform, or application and select them. Click **Assess**. In the displayed dialog box, confirm the number of servers to be assessment and click **OK**.



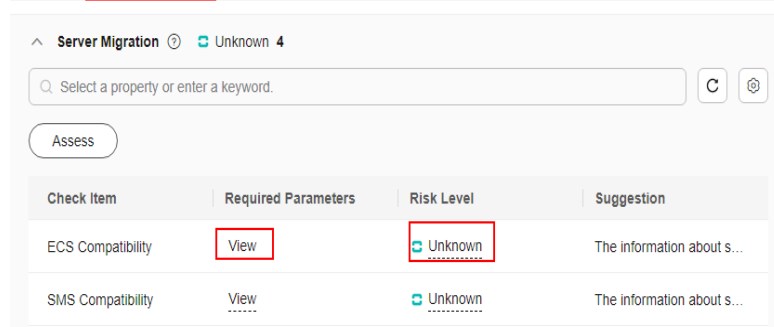
**Step 5** In the assessment list, view the assessment status and the number of migration risks at each level. Click the server name or a number in the row. On the **Migration Risks** tab displayed on the right, view all check items, server information required for checking each item, and risk levels.



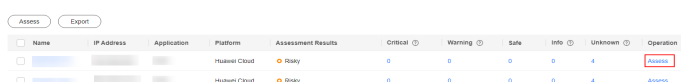
**Resource Details**



**Source Migration Risks**



**Step 6** Rectify the migration risks on a server based on the suggestions provided by the system. Then click **Assess** in the **Operation** column to assess the server again.



----End

## 1.8 Migration Plans

### 1.8.1 Creating a Server Migration Plan

A server migration plan outlines the source servers to be migrated and the paired target servers. You can create a migration workflow on the top of a migration plan to implement batch migration. The following content describes how to create a server migration plan.

#### Preparations

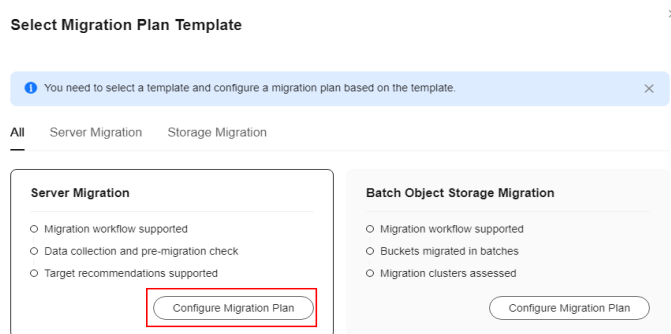
- [Create an application project.](#)
- Discover source servers and collect server details. MgC provides three collection methods to meet your requirements in different scenarios.
  - If your source servers are on a cloud platform, such as Alibaba Cloud, Huawei Cloud, AWS, Tencent Cloud, Google Cloud, or Azure, you can [collect the data about your servers over the Internet](#). You can also [manually add the server details to MgC](#).
  - If your source servers are in an on-premises IDC, you can [collect the server details over the intranet](#). MgC enables you to scan for servers by network range or VMware vCenter Server. You can also [manually add the server details to MgC](#).
- Install the MgC Agent in the source intranet environment and register an account. For details, see [Installing the MgC Agent for Windows](#). Then [connect the MgC Agent to MgC](#).

#### Notes and Constraints

- Only one migration workflow can be created for a migration plan.
- A server can only be added to one migration plan.
- A maximum of 100 servers can be added to a migration plan.

#### Procedure

- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select an [application migration project](#) from the drop-down list.
- Step 2** In the navigation pane, choose **Design > Migration Plans**.
- Step 3** Click **Create Migration Plan** in the upper right corner of the page.
- Step 4** In the **Server Migration** card, click **Configure Migration Plan**.

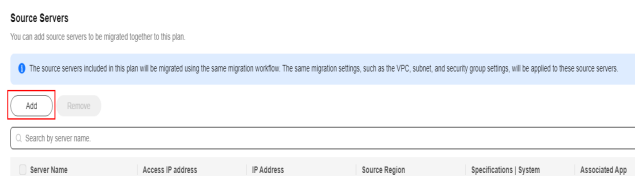


**Step 5** In the **Basic Settings** area, set parameters listed in [Table 1-39](#).

**Table 1-39** Basic settings

| Parameter              | Configuration                                                                                                                                         |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Migration Plan Name    | User-defined                                                                                                                                          |
| Description (Optional) |                                                                                                                                                       |
| Source Platform        | Select the cloud platform where the source servers are located.<br><b>NOTICE</b><br>A migration plan can only include servers from the same platform. |
| Target Region          | Select the region you want to migrate to.                                                                                                             |

**Step 6** In the **Source Servers** area, click **Add**.



**Step 7** Select the servers to be migrated together and click **Confirm**.

**CAUTION**

- The source servers included in this plan will be migrated using the same migration workflow. The same migration settings, such as the VPC, subnet, and security group settings, will be applied to these source servers.
- The selected servers must come from the source platform selected in [step 4](#).

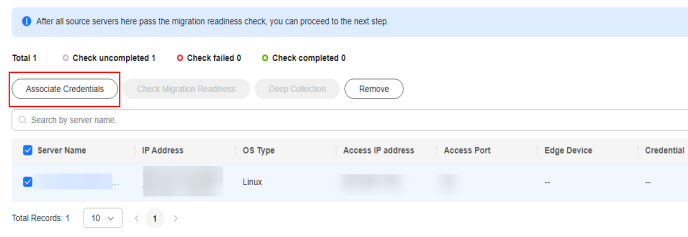
**Step 8** Click **Save and Next** to go to the **Check Source Servers** phase.

**Step 9** Configure server credentials. There are two methods for you to do this:

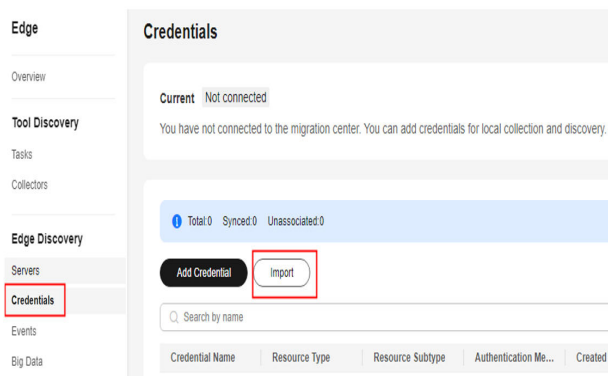
- **Manual addition:** You can choose this method if you configure credentials for a small number of servers. For details, see [Adding Resource Credentials](#).



- **Batch addition:** You can choose this method if you configure credentials for a large number of servers.
  - Click **Associate Credentials** above the list of source servers to download the template for batch configuring credentials. Open the template file, enter the credential information (username and password) of all servers in the current migration plan, and save the file.

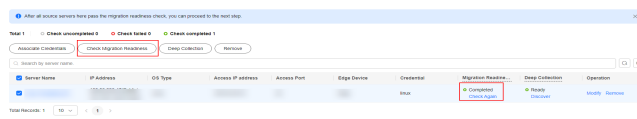


- Import the saved template file to the **MgC Agent you connected to MgC**. The system automatically configures the MgC Agent and credentials for the servers.



You can use **Modify** in the **Operation** column to update settings, such as **Access IP Address**, **Access Port**, **MgC Agent**, and **Credential**.

**Step 10** Select all the servers and click **Check Migration Readiness** above the list. The system checks if the source servers are ready for migration.



- If the **Migration Readiness Check** column displays a **Completed** status, the source server passes the check and is ready for migration.
- If the **Migration Readiness Check** column displays a **Check failed** status and the failure cause is that certain source server information is missing, click **Collect** in the **Deep Collection** column to collect the server details.
- If the **Migration Readiness Check** column displays a **Check failed** status and the failure cause is that the source server is unreachable, check whether the access information you provided is correct. If it is correct, check the migration readiness again.

**Step 11** After **Completed** shows up in the **Migration Readiness Check** column for all the source servers, click **Next** to go to the optional phase **Conduct Performance Collection**.

**Step 12** (Optional) Collect server performance data. The collected data can be used to get target server recommendations in the next step. A collection takes some time because performance data is sampled from source servers once every 5 minutes. You can determine whether to perform performance collection. For more constraints, see [Precautions for performance collection](#). If you do not need to collect server performance data, click **Next** to go to the **Configure Target** phase.

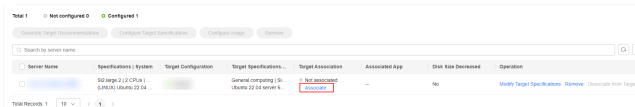
Select the source servers whose performance data needs to be collected and choose **Performance Collection > Start** above the list. **Collecting** will be displayed in the **Performance Collection** column

After the performance data collection is complete, you can:

- Click **View Performance** in the **Operation** column to view the collected server performance data.
- Choose **Performance Collection > Stop** above the list to suspend performance data collection for servers.

**Step 13** Configure target servers. You can use the following methods to complete this job:

- **Associating source servers with target servers:** If you have cloud servers on Huawei Cloud, you can associate them with the source servers. Then in the migration workflow, these cloud servers will receive data and workloads migrated from the source servers. For requirements about your existing cloud servers (target servers), see [Associating Source Servers with Target Servers](#).
  - a. Locate a source server in the list, click **Associate** in the **Target Association** column.



- b. In the displayed dialog box, select the region and project where the existing cloud servers are located. If the source server's storage disks are overprovisioned, regardless of the quantity or space, you can choose an existing cloud server that precisely fits your needs to optimize resource utilization and save costs.

---

#### NOTICE

- Ensure that the target server has an EIP bound.
  - Disk downsizing is only available for Linux, and the decreased sizes must be larger than the used sizes of the source disks.
  - In the cross-AZ migration scenario, only disk upsizing is supported. Even if you choose to downsize disks here, the settings will not be applied, and the system will create target disks as large as source disks.
- c. Click **Confirm**. After the association is complete, **Associated** shows up in the **Target Association** column. You can click **Details** to view the details of the associated target server. The system will automatically check whether the associated target server has downsized disks compared with

the source server. If it does, **Yes** will be displayed in the **Disk Downsized** column. If it does not, **No** will be displayed.

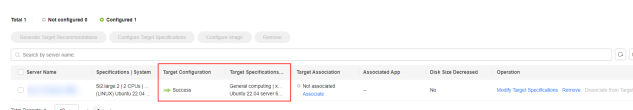
- **Generating target server recommendations:** You can choose to let the system recommend you rightsized Huawei Cloud servers based on the source server specifications. You can also manually adjust the recommended server specifications. In the subsequent migration workflow, the target servers will be automatically created based on the specifications configured here. Source servers with target servers associated will be skipped during the recommendation process.
  - a. In the source server list, select the ones that you want to generate target server recommendations for and click **Generate Target Recommendations** above the list.
  - b. Configure the policy used to compute target recommendations based on [Table 1-40](#).

**Table 1-40** Settings used for computing target recommendations

| Parameter | Description                                                                                                                                                                                                                            |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Priority  | <ul style="list-style-type: none"> <li>▪ High performance<br/>MgC recommends target servers with optimal performance.</li> <li>▪ Low cost<br/>MgC recommends the most cost-effective target servers that meet your demands.</li> </ul> |

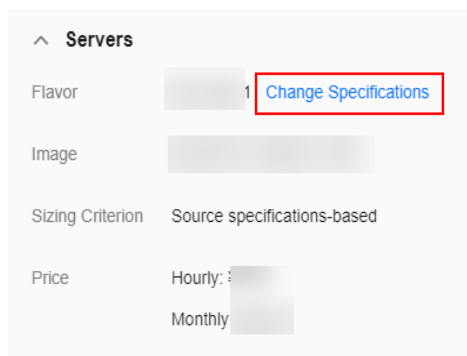
| Parameter   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Preferences | <p>Configure your preferences for target servers. Your preferences will be the first attempted to be matched during the recommendation. For details about how the system recommends appropriate target resources, see <a href="#">How Does MgC Generate Target Recommendations?</a></p> <ul style="list-style-type: none"> <li>▪ <b>Server Types (Optional)</b><br/>Select the server types you prefer.</li> <li>▪ <b>Server Series (Optional)</b><br/>Select the server series you prefer. The system will generate recommendations based on your preferred server types and series.</li> </ul> <p><b>NOTICE</b><br/>If you select <b>Display only series allowed on DeHs, Server Types</b> will be dimmed, and the server series allowed on DeHs in the target region will be listed.</p> <ul style="list-style-type: none"> <li>▪ <b>System Disk (Optional)</b><br/>Select the system disk type you prefer.</li> <li>▪ <b>Data Disk (Optional)</b><br/>Select the data disk type you prefer.</li> <li>▪ <b>Sizing Criteria</b><br/>Choose the criteria that the system will use to generate server recommendations.                             <ul style="list-style-type: none"> <li>○ If you select <b>As-in on source</b>, the system will recommend target servers with the same or as close CPU and memory capacity as the source servers.</li> <li>○ If you select <b>Performance-based</b>, you need to perform a <b>performance collection</b> for the source servers, and then set assessment parameters. The system will then recommend target servers with your desired CPU and memory capacity.</li> </ul> </li> </ul> <p><b>NOTICE</b><br/>The more performance data is collected, the more accurate the recommendations are. The collection of server performance data should take no less than seven days.</p> |

- c. Click **Confirm**. If **Success** shows up in the **Target Configuration** column, the target recommendation is generated. You can check the recommended configuration in the next column



- d. (Optional) Modify target server specifications recommended by the system if needed.
  - i. Locate a source server and click **Modify Target Specifications** in the **Operation** column.
  - ii. Modify the specifications and image for the target server.

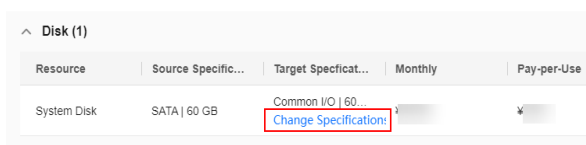
Recommendation



- iii. In the disk area, locate a disk and click **Modify** in the **Target Specifications** column to modify the disk type and capacity. Only disks on Linux target servers can be downsized if the paired source servers have over-provisioned storage resources. If you downsize a disk for the target server, the system will set **Disk Downized** to **Yes**. The reverse also applies.

**NOTICE**

- The system disk capacity ranges from 40 GB to 1,024 GB.
- The data disk capacity ranges from 10 GB to 32,768 GB.
- Disk downsizing is only available for Linux, and the decreased sizes must be larger than the used sizes of the source disks.
- In the cross-AZ migration scenario, only disk upsizing is supported. Even if you choose to downsize disks here, the settings will not be applied, and the system will create target disks as large as source disks.

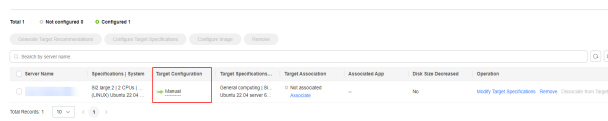


- **Configuring target server specifications:** You can manually configure the same target server specifications for the source servers all at once.

**CAUTION**

When selecting server specifications, it is crucial to ensure they meet your requirements. The system does not check whether they match the source servers. MgC does not assume responsibility for any issues arising from inappropriate server specifications.

- a. In the server list, select the source servers and click **Configure Target Specifications** above the list.
- b. Select the target server specifications and click **OK**. Then you can see **Target Configuration** changes to a **Manual** status.

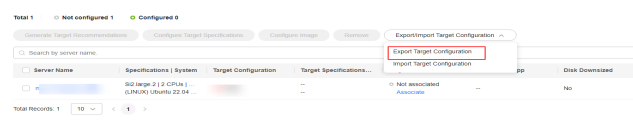


- **Configuring an image for target servers:** You can select an image to apply to all the target servers.

**CAUTION**

When selecting an image, it is crucial to ensure it meets your requirements. The system does not check whether it matches the source servers. MgC does not assume responsibility for any issues arising from inappropriate images.

- a. In the server list, select the source servers and click **Configure Image** above the list.
  - b. On the displayed page, choose an image type, an OS, and an OS version and click **Confirm**. If a target server has a system disk smaller than what defined in the image you choose, configuring the image will fail for that server.
- **Exporting and then importing target server configurations:** You can export the target server configurations, modify or configure the server, disk, and image settings, and then import the updated configurations back. Some technical expertise is needed for this process.
    - a. In the list of source servers, choose **Export/Import Target Configuration > Export Target Configuration** to download the server information to the local PC as an Excel file.



- b. Open the exported file. On the first sheet named **servers**, the blue columns (columns A to G) indicate the source server information, which **does not need to be modified**. The yellow columns (columns H to K) indicate the target server information, which **needs to be configured**.

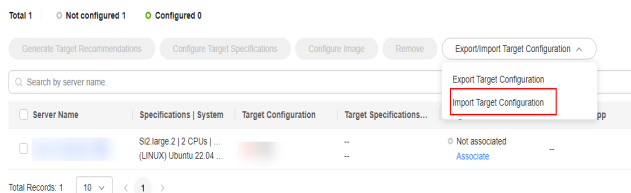
| ID   | name    | connect_ip | cpu_cores | mem | os_type | os_info                             | error | diskname | disk_type | image_type                                        | image |
|------|---------|------------|-----------|-----|---------|-------------------------------------|-------|----------|-----------|---------------------------------------------------|-------|
| UAD1 | example |            | 4         | 4G  | Linux   | Red Hat Enterprise Linux (3 target) |       | /dev/vda | public    | Public-CAD-HCE-BaseTemplate-2.0.240611-v05_04-01a |       |

- c. Configure the target server information (in columns H to K) according to **Table 1-41**.

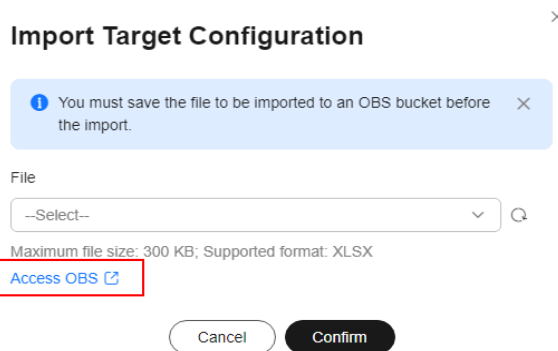
**Table 1-41** Parameters in columns H to K

| Parameter                         | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| flavor                            | <p>Enter the flavor name for the target server. The second sheet <b>flavors</b> lists the flavors of S- (general-purpose) and C- (computing-plus) series on sale in the target region. Choose a proper flavor and copy the flavor name to this cell.</p> <p><b>NOTE</b><br/>If a source server has been assessed, the recommended flavor is included in the exported file. If a source server has not been assessed, its <b>flavor</b> field is empty.</p>                                                                                                                                                                                                        |
| disks(name,osDisk,type,capacity;) | <p>Enter the information about all disks. Separate multiple disks with semicolons (;). You must specify the name, function (system or not), type, and size for each disk. Separate these items with commas (,). Please keep in mind that the disk size is a number without unit. The default unit is GiB.</p> <p>Example: /dev/sda,true,SAS,1024;/dev/sdb,false,SAS,2046</p> <p><b>NOTE</b><br/>If a source server has been assessed, the recommended disk specifications show up in the exported file. If a source server has not been assessed, the source disk specifications are used, except the disk type. The target disk type defaults to <b>SAS</b>.</p> |
| image_type                        | <p>Enter the image type. The options are:</p> <ul style="list-style-type: none"> <li>▪ <b>public</b>: public image</li> <li>▪ <b>private</b>: private image</li> <li>▪ <b>shared</b>: shared image</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| image                             | <p>Enter the image name. You can view all available images in the target region on the third sheet <b>images</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

- d. After configuring the target server information for all source servers, save the Excel file. Return to the MgC console. Choose **Export/Import Target Configuration > Import Target Configuration** above the list of source servers.



- e. In the displayed dialog box, click **Access OBS** to go to the OBS page.



- f. Select a bucket and upload the Excel file to the bucket.
- g. After the upload is successful, return to the MgC console. In the **Import Target Configuration** dialog box, select the file stored in the OBS bucket from the drop-down list.
- h. Click **Confirm** to import the target server configurations.

#### NOTE

- If the **flavor** parameter is empty in a row, this row will be ignored during the import.
  - If the **disk** or **image** parameter is left empty in a row, the source server's disk and image information is used during the import.
  - If the number in the **disk** field of a row is inconsistent with what the source server actually has, an error message is reported, indicating that the disk numbers are inconsistent.
  - If in a row, the disk type conflicts with the flavor, an error message is displayed, indicating that the disk type is incorrect.
- **Associating source servers with DeHs** if you want to migrate to Huawei Cloud DeH. Then after you create a migration workflow for this plan, the system will provision the recommended target servers on the DeHs.
    - a. In the source server list, select the ones to be associated with a DeH.
    - b. Choose **DeH Configuration > Associate DeH** above the list.
    - c. Select the target DeH to be associated from the drop-down list and click **Confirm**. **Associated** will show up in the **DeH** column. You can click **Details** to view the associated DeH.

#### **Step 14** Perform subsequent operations as needed.

- Create a server migration workflow.  
Click **Create Workflow** to create a migration workflow. For more information, see [Step 5](#).



- Only save the migration plan.  
Click **Confirm** to save the migration plan. Then you can:
  - Click **Design** in the **Operation** column to modify the migration plan.
  - Click **Create Workflow** in the **Operation** column to create a server migration workflow to migrate the source servers included in the migration plan. For more information, see [Step 5](#).

----End

## 1.8.2 Creating a Batch Storage Migration Plan

You can configure migration plans using templates designed for different resources and create migration workflows on the top of these plans. You can also view the migration settings for resources by application. Follow this section to configure a migration plan for batch migrating object storage buckets.

If only one object storage bucket needs to be migrated, you can [create a migration workflow](#) directly.

### Prerequisites

- Source buckets have been discovered over the Internet and their details have been collected.
- (Optional) A deep collection has been performed for the buckets to be migrated.

### Notes

- A migration plan can be used to migrate buckets from the same source platform and to the same target region.
- A source bucket can be included in multiple migration plans.
- Source buckets in a migration plan may have different prefixes. You can give them the same prefix after they are migrated to the target bucket.

### Procedure

- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane, choose **Design > Migration Plans**.
- Step 3** Click **Create Migration Plan** in the upper right corner of the page.
- Step 4** In the **Batch Object Storage Migration** card, click **Configure Migration Plan**.
- Step 5** In the **Basic Settings** area, set parameters listed in [Table 1-42](#).

**Table 1-42** Basic settings

| Parameter              | Configuration |
|------------------------|---------------|
| Migration Plan Name    | User-defined  |
| Description (Optional) | User-defined  |

| Parameter       | Configuration                                                     |
|-----------------|-------------------------------------------------------------------|
| Source Platform | Select the cloud platform where the source resources are located. |
| Target Region   | Select the region where the target buckets are located.           |

**Step 6** Above the source bucket list, click **Add**.

**Step 7** Select the buckets to be migrated in a batch. For each of the selected buckets, click **Modify** in the **Operation** column to specify the migration method. For details about the migration methods, see [Table 1-43](#). Then click **Confirm**.

 **CAUTION**

- The selected resources must come from the source platform selected in **Basic Settings**.
- A maximum of 100 buckets can be added.

**Table 1-43** Migration methods

| Migration Method | Description                                                                                      |
|------------------|--------------------------------------------------------------------------------------------------|
| Full migration   | Migrates all data in the source bucket or specified directories.                                 |
| List migration   | Migrates objects recorded in the list files. The list files must be stored in the target bucket. |
| Prefix migration | Migrates objects matched with the specified names or prefixes.                                   |

**Step 8** In the list of buckets to be migrated, click **Modify** in the **Operation** column.

**Step 9** Select the resource credential. It is best to enter the total number and size of objects to be migrated. Then click **Confirm**.

- If the migration method configured for the bucket is **List migration**, in the **List Path** box, enter the directory that stores the lists of objects to be migrated. The directory must end with a slash (/).
- If the migration method configured for the bucket is **Prefix migration**, add the names or prefixes of objects to be migrated. Note that you need to click **Save** each time you add an object name or prefix.

 **NOTE**

If the files to be migrated are stored in the root directory of the source bucket, add their name prefixes directly. If the files are stored in a non-root directory, add their directories and name prefixes in the format of *Directory/Prefix*.

**Step 10** After you configure the migration settings for all buckets to be migrated, click **Next**.

- Step 11** For each source bucket, click **Modify** in the **Operation** column. Then select the credential used for accessing the target bucket, specify the target bucket, enter a prefix to rename or relocate migrated objects, and click **Save**.
- Step 12** After you configure the target bucket settings for all buckets to be migrated, click **Next**. You can assess how large of a migration cluster is required for the migration and then create a migration cluster with the recommended specifications. Alternatively, you can skip this step and use an existing migration cluster. For details about how to create a cluster, see [Creating a Migration Cluster](#).
- Step 13** Click **Next** to select an existing migration cluster. All resources in this plan will be migrated using this cluster.
- Step 14** Click **Select Cluster**. The **Select Cluster** dialog box is displayed on the right.
- Step 15** In the cluster list, select the cluster you want to use and click **Confirm**. If you want to modify an existing cluster to meet your requirements, see [Managing a Migration Cluster](#).
- Step 16** Click **OK**. After migration plan is created, you can see it in the list.
- If you need to modify the plan settings, click **Design** in the **Operation** column.
  - After **Completed** appears in the **Progress** column, click **Create Workflow** in the **Operation** column to [create a migration workflow](#) to migrate all buckets in the plan in a batch.

----End

### 1.8.3 Creating a Batch File Storage Migration Plan

Follow this section to configure a migration plan for batch migrating file systems.

The Batch Object Storage Migration template can be used to migrate multiple file systems in a batch. If only one file system needs to be migrated, [create a migration workflow](#) directly.

#### Preparations

- Creating a migration project  
Create a migration project on the MgC console. For details, see [Managing Migration Projects](#).
- Creating a migration cluster  
Create a dedicated migration cluster for this migration. A cluster consists of a master node and several list and migration nodes. For details about how to create a cluster, see [Creating a Migration Cluster](#).
- Creating target file systems  
Create target file systems for receiving migrated source data. For details, see [Creating a General Purpose File System](#) or [Creating an SFS Turbo File System](#).

#### Notes

- Only one migration workflow can be created for a migration plan.

- A maximum of 100 file systems can be added to a migration plan.
- Target file systems included in a migration plan must be in the same region.

## Procedure

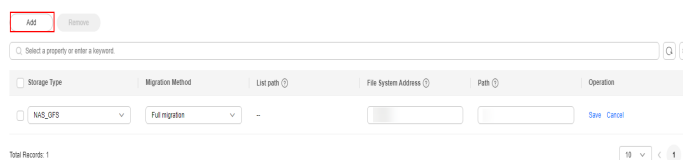
- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane, choose **Design > Migration Plans**.
- Step 3** Click **Create Migration Plan** in the upper right corner of the page.
- Step 4** In the **Batch File Storage Migration** card, click **Configure Migration Plan**.
- Step 5** In the **Basic Settings** area, set parameters listed in [Table 1-44](#).

**Table 1-44** Basic settings

| Parameter              | Configuration                                                |
|------------------------|--------------------------------------------------------------|
| Migration Plan Name    | User-defined                                                 |
| Description (Optional) | User-defined                                                 |
| Target Region          | Select the region where the target file systems are located. |

- Step 6** Click **Add**. A new row will be added below, allowing you to configure a source file system. Each click of this button will add another row, enabling you to include multiple source file systems in this plan.

**Figure 1-45** Adding a source file system



- Step 7** Configure a source file system based on [Table 1-45](#).

**Table 1-45** Parameters for configuring a source file system

| Parameter    | Description                                                                                | Remarks |
|--------------|--------------------------------------------------------------------------------------------|---------|
| Storage Type | Supported source storage types include NAS_GFS, NAS_NFS_V3_PROTOCOL, and NAS_NFS_V3_MOUNT. | -       |

| Parameter        | Description                                                                                                                                                                                                                                                                                    | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Migration Method | <p>Select a migration method.</p> <ul style="list-style-type: none"> <li>● Full migration: This method is used to migrate all data in a specific path in the source file system.</li> <li>● List migration: This method is used to migrate files and directories recorded in lists.</li> </ul> | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| List Path        | <p>If the list migration method is used, enter the path to the list files. If the full migration method is used, leave it blank.</p>                                                                                                                                                           | <p>A list file must meet the following requirements:</p> <ul style="list-style-type: none"> <li>● A list file cannot exceed 30 MB.</li> <li>● A list file must be a .txt file.</li> <li>● A list file must be in UTF-8 without BOM.</li> <li>● Each line in a list file can contain only one file or directory name, and the name must be URL encoded.</li> <li>● Each line in a list file cannot exceed 16,384 (16 × 1,024) bytes, or the migration will fail.</li> <li>● A list file can contain a maximum of 10,000 lines.</li> </ul> |



| Parameter           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| File System Address | <p>Enter the mount address of the source file system.</p> <ul style="list-style-type: none"> <li>If the storage type is <b>NAS_GFS</b>, the file system address can include a host name, domain name, (optional) subdomain, port, and path.</li> <li>If the storage type is <b>NAS_NFS_V3_PROTOCOL</b> or <b>NAS_NFS_V3_MOUNT</b>, the file system address must match any of the following formats: <ul style="list-style-type: none"> <li>- <i>&lt;IP-address&gt;:/</i></li> <li>- <i>&lt;IP-address&gt;:/&lt;path&gt;</i></li> <li>- <i>&lt;domain-name&gt;:/</i></li> <li>- <i>&lt;domain-name&gt;:/&lt;path&gt;</i></li> </ul> </li> </ul> | <p>For a full migration, the combination of a source file system address and the path to be migrated must be unique. For a list migration, the combination of a source file system address and the list path must be unique. In both cases, the prefix matching rule is applied.</p> <p>For example, if you have added the file system address <b>192.168.0.1:/a</b> with a migration path <b>/abc/a</b>, an error will be reported if you add the file system address <b>192.168.0.1:/a</b> with a migration path <b>/abc</b>. To overwrite an existing path, you need to delete the existing address and path combination first.</p> |
| Path                | <p>Enter the directory where files and directories to be migrated are located. The format is <i>/ Folder name</i>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>If the list migration method is selected, enter <b>/</b> in the <b>Path</b> text box.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

**Step 8** Each time after you configure a source file system, click **Save** in the **Operation** column. After all source file systems to be migrated are configured, click **Next**.

**Step 9** In the list, click **Modify** in the **Operation** column to configure a target file system for each source file system.

**Table 1-46** Parameters for configuring a target file system

| Parameter    | Description                                                                                                    | Remarks |
|--------------|----------------------------------------------------------------------------------------------------------------|---------|
| Source Path  | This path is automatically generated by combining the source file system address with the path to be migrated. | -       |
| Storage Type | Only <b>NAS_NFS_V3_MOUNT</b> is supported.                                                                     |         |

| Parameter           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Remarks                                                                   |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| File System Address | <ul style="list-style-type: none"> <li>If a General Purpose file system is used as the target, enter the mount address of the file system. To obtain the mount address, go to the file system list and click the  icon next to the address in the <b>Mount Point</b> column.</li> <li>If an SFS Turbo file system is used as the target, enter the shared path of the file system. To obtain the shared path, go to the SFS Turbo file system list, click  next to the path in <b>Shared Path</b> column.</li> </ul> | Combinations of target file system addresses and paths can be duplicated. |
| Path                | Enter the directory for storing files and directories migrated. The format is <i>/Folder name</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                                                         |

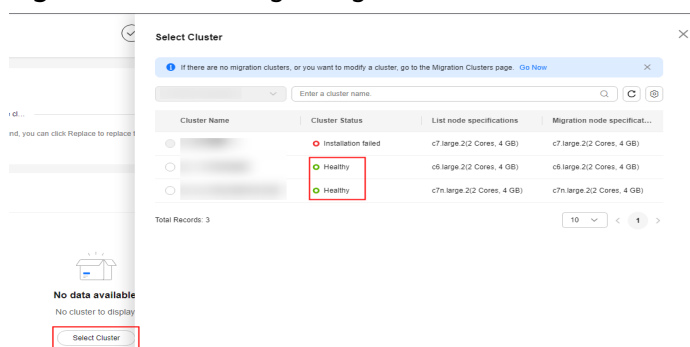
**Step 10** Each time after you configure a target file system, click **Save** in the **Operation** column. After you configure a target file system for each source file system, click **Next**. You can assess how large of a migration cluster is required for the migration and then create a migration cluster with the recommended specifications. Alternatively, you can skip this step and use an existing migration cluster. For details about how to create a cluster, see [Creating a Migration Cluster](#).

**Step 11** Click **Next** to select an existing migration cluster. All resources in this plan will be migrated using this cluster.

**Step 12** Click **Select Cluster**. The **Select Cluster** page is displayed on the right.

**Step 13** In the cluster list, select the cluster to be used and click **OK**. The cluster must be in a healthy state. If you want to modify an existing cluster to meet your requirements, see [Managing a Migration Cluster](#).

**Figure 1-46** Selecting a migration cluster



- Step 14** Click **OK**. After migration plan is created, you can see it in the list.
- If you need to modify the plan settings, click **Design** in the **Operation** column.
  - After **Completed** appears in the **Progress** column, click **Create Workflow** in the **Operation** column to [create a migration workflow](#) to migrate all source file systems in the plan in a batch.
- End

## 1.9 Migration Clusters

### 1.9.1 Creating a Migration Cluster

You can create dedicated migration clusters to accelerate storage migration. A migration cluster consists of nodes that have the migration plugin installed and are used to execute migration and listing tasks.

#### Precautions

- A maximum of two migration clusters can be created in each region in an account.
- To ensure migration stability and data security, you are not allowed to log in to nodes in migration clusters. If you indeed need to log in to the nodes, contact technical support.
- If a migration cluster is idle for more than 30 days, its status will change to **Discarded**. The cluster will not be deleted but cannot be restored.
- You can see the details about resources contained in a migration cluster and the security group settings of all cluster nodes in [Migration Cluster Resources and Settings](#).

#### Billing

You are billed at standards rates for migration clusters and additional resources used during migrations.

- Master, migration, and list nodes in migration clusters are all ECSs, and you pay for these ECSs. For details, see [ECS Pay-per-Use Billing](#) or [ECS Price Calculator](#).
- If you migrate over the Internet, you need to pay for NAT gateways used by migration clusters. For details, see [NAT Gateway Billing](#) or [NAT Gateway Price Calculator](#).
- If you choose to enable log collection, you need to pay Log Tank Service (LTS) for resources you consume. For details, see [LTS Billing](#) or [LTS Price Calculator](#).


#### Procedure

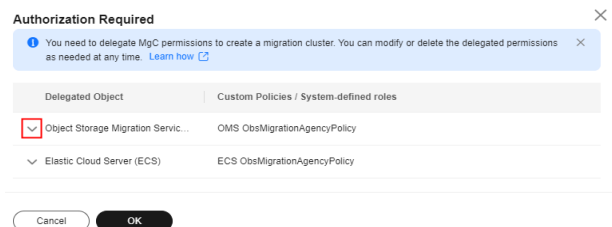
- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select an [application migration project](#) from the drop-down list.



**Step 2** In the navigation pane, choose **Deploy > Migration Clusters**.

**Step 3** Click **Create Cluster** in the upper right corner of the page.

If this is your first time to create a migration cluster, you need to delegate MgC the required permissions. Click  to view the permissions to be assigned.



**Step 4** Configure the parameters listed in [Table 1-47](#).

**Table 1-47** Parameters for creating a cluster

| Area           | Parameter    | Configuration                                        | Constraints                                                                |
|----------------|--------------|------------------------------------------------------|----------------------------------------------------------------------------|
| Basic Settings | Cluster Name | Enter a name.                                        | The cluster name must be unique in the same account.                       |
|                | Region       | Select the region to provision the cluster.          | The cluster must be provisioned in the target region you are migrating to. |
|                | Cluster Type | Select what the cluster will be used for.            | Currently, only storage migration is supported.                            |
| Node Settings  | Master Node  | It is used to manage migration nodes and list nodes. | A cluster can only have one master node.                                   |

| Area             | Parameter      | Configuration                                                                                                                            | Constraints                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | Migration Node | Migration nodes are used for executing migration and verification tasks. The recommended specifications are 8 vCPUs and 16 GB of memory. | <ul style="list-style-type: none"> <li>• The node specifications cannot be modified after the cluster is created.</li> <li>• The number of nodes must meet the following requirements:                             <ul style="list-style-type: none"> <li>- Number of migration nodes + Number of list nodes + 1 ≤ 100</li> <li>- Number of migration nodes + Number of list nodes + 1 ≤ Number of unused IP addresses in the subnet</li> </ul> </li> </ul> |
|                  | List Node      | List nodes are used for listing tasks. The recommended specifications are 8 vCPUs and 16 GB of memory.                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Network Settings | VPC            | Select a VPC from the drop-down list.                                                                                                    | -                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                  | Subnet         | Make sure that there are enough unused IP addresses for the migration and list nodes in this cluster.                                    | Number of unused IP addresses in the subnet ≥ Number of migration nodes + Number of list nodes + 1                                                                                                                                                                                                                                                                                                                                                          |

| Area              | Parameter                    | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Constraints                                           |
|-------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
|                   | Network Type                 | <ul style="list-style-type: none"> <li>● <b>Internet:</b> You need to select a public NAT gateway. If there is no gateway available, choose <b>Buy Gateway</b> from the drop-down list and select the gateway specifications and EIPs you want to associate with the gateway. A maximum of 20 EIPs can be selected at a time.</li> <li>● <b>Intranet:</b> This option is suitable for data migration within a region.</li> <li>● <b>Private line:</b> Source data is directly accessed through the private line. For details about Direct Connect, see <a href="#">Direct Connect</a>.</li> </ul> | -                                                     |
| Advanced Settings | DNS Configuration (Optional) | Enter the IP address of the DNS server to update the value of <b>nameserver</b> in the <b>/etc/resolv.conf</b> file. Use commas (,) to separate multiple DNS server addresses, for example, 192.0.2.1,192.0.2.2.                                                                                                                                                                                                                                                                                                                                                                                  | A maximum of three DNS IP addresses can be specified. |
|                   | Domain Mapping (Optional)    | Add mappings between domain names and IP addresses to update the <b>/etc/hosts</b> file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | A maximum of 500 mappings can be added.               |

| Area | Parameter        | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Constraints                                                                                                                                                                               |
|------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -    | Traffic Limiting | <p>Allocate the maximum bandwidth to be used by the workflow during a specified period.</p> <ul style="list-style-type: none"> <li>If you do not select this option, migration traffic is not limited.</li> <li>If you select this option, limit the migration traffic by setting the start time, end time, and bandwidth limit.</li> </ul> <p><b>NOTICE</b><br/>For example, if you set <b>Start Time</b> to <b>08:00</b>, <b>End Time</b> to <b>12:00</b>, and <b>Maximum Bandwidth</b> to <b>20 MB/s</b>, the maximum migration speed is limited to 20 MB/s when the migration task is running in the period from 08:00 to 12:00. The migration speed is not limited beyond this period.</p> | <ul style="list-style-type: none"> <li>A maximum of five traffic limiting rules can be added.</li> <li>The time is the local standard time of the region you are migrating to.</li> </ul> |
|      | Log Collection   | <ul style="list-style-type: none"> <li>If this option is enabled, logs generated during the migration are collected for possible troubleshooting later.</li> <li>If this option is disabled, logs generated during storage migrations are not collected.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                             | -                                                                                                                                                                                         |

**Step 5** Click **Confirm**. Then you can view the cluster in the list. For details about cluster statuses, see [Cluster Statuses](#). If the cluster status is **Creation failed**, move the cursor to the status to view the failure cause. After the fault is rectified, choose **More > Retry** to try to create the cluster again.

**Step 6** After the migration cluster is created, perform the following operations:

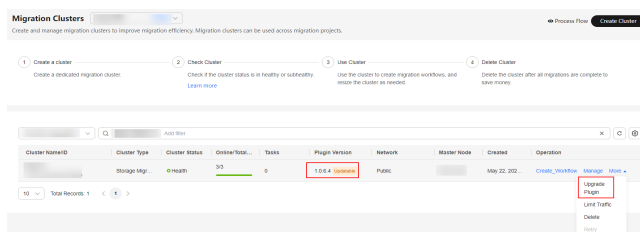
- If the cluster status is **Healthy** or **Subhealthy**, click **Create Workflow** in the **Operation** column to .

- Click **Manage** in the **Operation** column to add or delete nodes and traffic limiting rules for the cluster. For details, see [Managing a Migration Cluster](#).

----End

## Upgrading Plug-ins

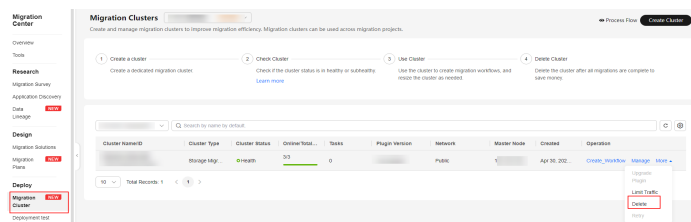
You can upgrade the migration plugin to the latest version for a cluster by choosing **More > Upgrade Plugin** in the **Operation** column.



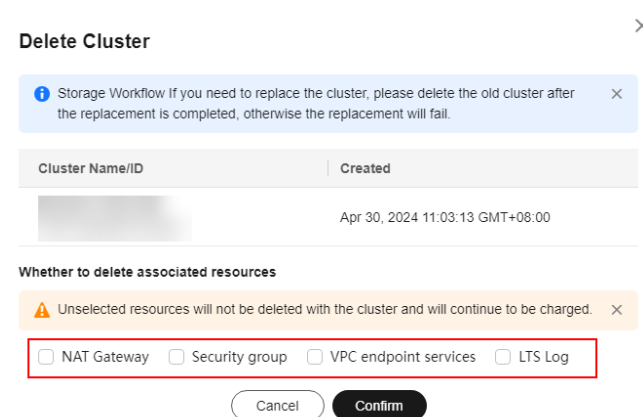
## Deleting a Migration Cluster

If a migration cluster is no longer needed after your data migration is complete, you can delete the cluster and the associated resources.

- Step 1** In the cluster list, locate the cluster to be deleted and choose **More > Delete** in the **Operation** column.



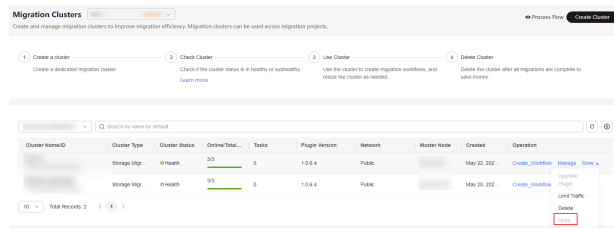
- Step 2** Select whether to delete associated resources and click **OK**.



----End

## Retrying to Create a Migration Cluster

If a migration cluster fails to be created, after you rectify the fault, you can try to create the cluster again by choosing **More > Retry** in the **Operation** column.



## 1.9.2 Managing a Migration Cluster

For a migration cluster, you can configure traffic limiting rules and add or remove nodes as needed.

### Prerequisites

You have [created a cluster](#).

### Adding a Traffic Limiting Rule

- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select an [application migration project](#) from the drop-down list.
- Step 2** In the navigation pane, choose **Deploy > Migration Clusters**.
- Step 3** In the cluster list, locate a migration cluster and click **Manage** in the **Operation** column.
- Step 4** In the **Traffic Limiting** area, click **Add** to add a rule.
- Step 5** Configure the start time, end time, and bandwidth limit.

For example, if you set **Start Time** to **08:00**, **End Time** to **12:00**, and **Maximum Bandwidth** to **20 MB/s**, the maximum migration speed is limited to 20 MB/s when the migration task is running in the period from 08:00 to 12:00. The migration speed is not limited beyond this period.

#### NOTICE

- The time is the local standard time of the region you are migrating to.
- A maximum of five rules can be added.

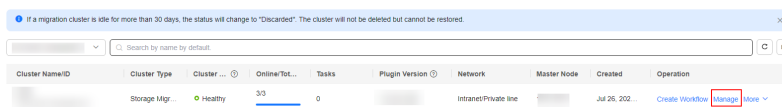
- Step 6** Click **Confirm**.

----End

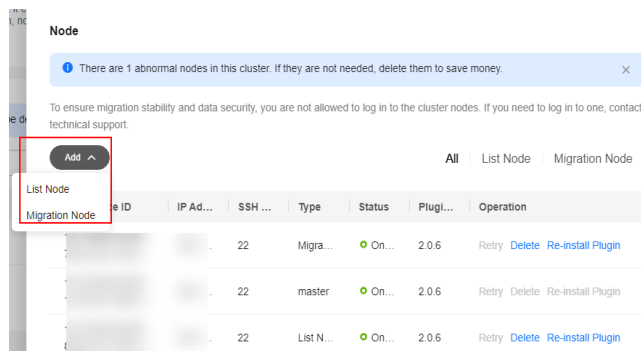
### Adding Nodes

The procedure for adding a migration node is the same as that for adding a list node.

- Step 1** Sign in to the [MgC console](#). In the left navigation pane, choose **Deploy > Migration Clusters**.
- Step 2** In the cluster list, click **Manage** in the **Operation** column.

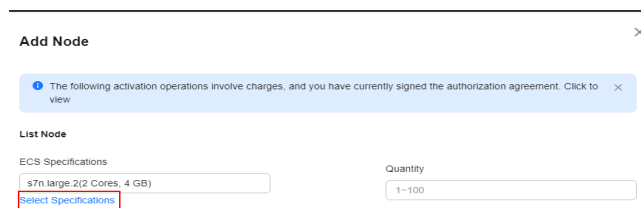


**Step 3** In the node information area, choose **Add > Migration Node**.



**Step 4** Select the node specifications and enter the number of nodes to be added. The number of nodes in the cluster must meet the following requirements:

- Number of migration nodes + Number of list nodes + 1 ≤ 100
- Number of migration nodes + Number of list nodes + 1 ≤ Number of unused IP addresses in the subnet



**Step 5** Click **Confirm**. After the nodes are added, MgC starts to install the migration plugin on these nodes, and you can view the added nodes in the node list.

----End

### 1.9.3 Billing

You are billed at standards rates for migration clusters and additional resources used during migrations.

- Master, migration, and list nodes in migration clusters are all ECSs, and you pay for these ECSs. For details, see [ECS Pay-per-Use Billing](#) or [ECS Price Calculator](#).
- If you migrate over the Internet, you need to pay for NAT gateways used by migration clusters. For details, see [NAT Gateway Billing](#) or [NAT Gateway Price Calculator](#).
- If you choose to enable log collection, you need to pay Log Tank Service (LTS) for resources you consume. For details, see [LTS Billing Description](#) or [LTS Price Calculator](#).

### 1.9.4 Cluster Statuses

For details about cluster statuses, see [Table 1-48](#).

**Table 1-48** Cluster statuses

| Status               | Description                                                                                                                                    |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Creating             | Cluster resources are being created.                                                                                                           |
| Creation failed      | Cluster resources fail to be created.                                                                                                          |
| Connecting           | The master node is waiting for going online, and other nodes are waiting for creation.                                                         |
| Healthy              | All nodes are online.                                                                                                                          |
| Subhealthy           | At least one migration node and one list node are online.                                                                                      |
| Unavailable          | All migration nodes or all list nodes are offline.                                                                                             |
| Offline              | The master node is offline. The cause may be that the network is interrupted or the ECS is deleted. Check the VPCEP service and ECS resources. |
| Upgrading            | Plugins are being upgraded in the cluster.                                                                                                     |
| Upgrade failed       | Plugins failed to be upgraded in the cluster.                                                                                                  |
| Discarding           | The cluster is being discarded because no tasks have run in the cluster within 30 days.                                                        |
| Discard failed       | The cluster failed to be discarded.                                                                                                            |
| Deleting             | The cluster is being deleted.                                                                                                                  |
| Deletion failed      | The cluster failed to be deleted.                                                                                                              |
| Discarded            | The cluster is discarded since its VPCEP resources are deleted.                                                                                |
| Pending creation     | Cluster resources are waiting for creation.                                                                                                    |
| Installing           | Plugins are being installed on the master node.                                                                                                |
| Installation failed  | Plugins failed to be installed on the master node.                                                                                             |
| Pending installation | The master node is waiting for plugin installation.                                                                                            |
| Pending upgrade      | The cluster is waiting for plugin upgrade.                                                                                                     |
| Pending deletion     | The cluster is waiting for deletion.                                                                                                           |

## 1.9.5 Migration Cluster Resources and Settings

This section describes the resources and their settings of a migration cluster.



## Migration Cluster Resources

| Resource    | Configurable During Cluster Creation | Mandatory | Quantity                                                                                                                                                                                                                                        | Naming Rule                       | Description                                                                                                                                           |
|-------------|--------------------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| ECSs        | Yes                                  | Yes       | <ul style="list-style-type: none"> <li>Master node: 1</li> <li>Migration nodes: created based on the settings specified during cluster creation</li> <li>List nodes: created based on the settings specified during cluster creation</li> </ul> | <i>oms_cluster_ecs_Node ID</i>    | These ECSs have the migration plug-in installed and are used to schedule and perform migration tasks.                                                 |
| NAT gateway | Yes                                  | No        | 1                                                                                                                                                                                                                                               | <i>oms_cluster_nat_Cluster ID</i> | This NAT gateway enables list and migration nodes to communicate with migration sources over the public network, so that source data can be migrated. |

| Resource | Configurable During Cluster Creation | Mandatory | Quantity | Naming Rule                                                                                                                                                                                                                                                                                                            | Description                                                                                                                                                                 |
|----------|--------------------------------------|-----------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LTS      | Yes                                  | No        | 1        | Host group name:<br>oms_lts_host_group_ <i>Cluster ID</i><br>Host group name:<br>oms_lts_host_group_label_ <i>Cluster ID</i><br>Log group name:<br>oms_lts_log_group_ <i>Cluster ID</i><br>Log stream name:<br>oms_lts_stream_group_ <i>Cluster ID</i><br>Log access name:<br>oms_lts_access_config_ <i>Cluster ID</i> | LTS is used to save and search for logs of the migration cluster. If <b>Log Collection</b> is not enabled during cluster creation, these LTS resources will not be created. |

| Resource             | Configurable During Cluster Creation | Mandatory | Quantity | Naming Rule                               | Description                                                                                                                                                                                                     |
|----------------------|--------------------------------------|-----------|----------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VPC endpoint service | No                                   | Yes       | 1        | <i>Region name.oms-cluster.Service ID</i> | <p>This VPC endpoint service allows OMS to communicate with the master node in the migration cluster to manage migration tasks.</p> <p>For details, see <a href="#">VPC Endpoint Service Configuration</a>.</p> |

| Resource        | Configurable During Cluster Creation | Mandatory | Quantity | Naming Rule                          | Description                                                                                                                                                                                                                                                               |
|-----------------|--------------------------------------|-----------|----------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Security groups | No                                   | Yes       | 2        | oms_cluster_sg_master<br>_Cluster ID | <p>This is the security group of the master node in the migration cluster. It enables the communication between OMS and the migration cluster.</p> <p>For details about the security group settings, see <a href="#">Security Group Settings for the Master Node</a>.</p> |

| Resource | Configurable During Cluster Creation | Mandatory | Quantity | Naming Rule                                | Description                                                                                                                                                                                                                                                                                  |
|----------|--------------------------------------|-----------|----------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |                                      |           |          | oms_cluster_sg_agent_<br><i>Cluster ID</i> | <p>This is the security group of the list and migration nodes in the migration cluster. It enables communication between nodes in the migration cluster.</p> <p>For details about the security group settings, see <a href="#">Security Group Settings for List and Migration Nodes</a>.</p> |

## VPC Endpoint Service Configuration

| Item                  | Configuration                                                           | Description                                                                         |
|-----------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| VPC                   | The VPC where the migration cluster works is selected.                  | -                                                                                   |
| Service Type          | Interface                                                               | -                                                                                   |
| Connection Approval   | This option is enabled.                                                 | VPC endpoints need to be approved before they can connect to this endpoint service. |
| Port Mapping          | Ports 22 and 9002 are mapped.                                           | They are used for plugin installation, task delivery, and task management.          |
| Backend Resource Type | ECS                                                                     | The ECS used as the master node.                                                    |
| Connection Management | The VPC endpoint of OMS is allowed to access this VPC endpoint service. | Allows OMS to communicate with the master node in the migration cluster.            |
| Permission Management | OMS is added to the whitelist.                                          | Allows access from the VPC endpoint of OMS.                                         |

## Security Group Settings for the Master Node

| Direction | Priority | Action | Type | Protocol & Port | Source or Destination             | Description                                                                     |
|-----------|----------|--------|------|-----------------|-----------------------------------|---------------------------------------------------------------------------------|
| Inbound   | 1        | Allow  | IPv4 | All             | Security group of the master node | Allows VMs in the security group to communicate with each other.                |
| Inbound   | 1        | Allow  | IPv6 | All             | Security group of the master node | Allows VMs in the security group to communicate with each other.                |
| Inbound   | 1        | Allow  | IPv4 | TCP: 22         | 198.19.128.0/17                   | Allows OMS to communicate with the master node to install the migration plugin. |

| Direction | Priority | Action | Type | Protocol & Port | Source or Destination                              | Description                                                                 |
|-----------|----------|--------|------|-----------------|----------------------------------------------------|-----------------------------------------------------------------------------|
| Inbound   | 1        | Allow  | IPv4 | TCP: 9002       | 198.19.128.0/17                                    | Allows OMS to communicate with the master node to deliver and manage tasks. |
| Inbound   | 1        | Allow  | IPv6 | All             | The security group of the list and migration nodes | Allows the list and migration nodes to communicate with the master node.    |
| Inbound   | 1        | Allow  | IPv4 | All             | The security group of the list and migration nodes | Allows the list and migration nodes to communicate with the master node.    |
| Outbound  | 1        | Allow  | IPv6 | All             | ::/128                                             | Allows outbound traffic to communicate with the migration source.           |
| Outbound  | 1        | Allow  | IPv4 | All             | 0.0.0.0/0                                          | Allows outbound traffic to communicate with the migration source.           |
| Outbound  | 1        | Allow  | IPv6 | All             | The security group of the list and migration nodes | Allows the list and migration nodes to communicate with the master node.    |
| Outbound  | 1        | Allow  | IPv4 | All             | The security group of the list and migration nodes | Allows the list and migration nodes to communicate with the master node.    |

## Security Group Settings for List and Migration Nodes

| Direction | Priority | Action | Type | Protocol & Port | Source or Destination                              | Description                                                              |
|-----------|----------|--------|------|-----------------|----------------------------------------------------|--------------------------------------------------------------------------|
| Inbound   | 1        | Allow  | IPv6 | All             | Security group of the master node                  | Allows the list and migration nodes to communicate with the master node. |
| Inbound   | 1        | Allow  | IPv4 | All             | Security group of the master node                  | Allows the list and migration nodes to communicate with the master node. |
| Inbound   | 1        | Allow  | IPv4 | All             | The security group of the list and migration nodes | Allows VMs in the security group to communicate with each other.         |
| Inbound   | 1        | Allow  | IPv6 | All             | The security group of the list and migration nodes | Allows VMs in the security group to communicate with each other.         |
| Outbound  | 1        | Allow  | IPv4 | All             | 0.0.0.0/0                                          | Allows outbound traffic to communicate with the migration source.        |
| Outbound  | 1        | Allow  | IPv6 | All             | ::/128                                             | Allows outbound traffic to communicate with the migration source.        |
| Outbound  | 1        | Allow  | IPv6 | All             | Security group of the master node                  | Allows the list and migration nodes to communicate with the master node. |
| Outbound  | 1        | Allow  | IPv4 | All             | Security group of the master node                  | Allows the list and migration nodes to communicate with the master node. |



## 1.10 Migration Workflows

### 1.10.1 Workflow Quotas

To ensure smooth migrations, MgC has the following limits on migration workflows.

- A maximum of 50 migration workflows can be created per day in a project.
- A maximum of 1,000 servers can be concurrently. For any servers beyond this number, the workflows will pause at the first step and put these servers in a pending state until other servers complete their migration. The workflows will then automatically start on these servers in the order the workflows were created.
- A maximum of 100 resources can be included in a workflow.

### 1.10.2 Creating a Server Migration Workflow

This section describes how to create a server migration workflow using a template.

#### Constraints

- A workflow can contain a maximum of 100 servers.
- You can migrate a maximum of 1,000 servers concurrently. For any servers beyond this number, the workflows will pause at the first step and put these servers in a pending state until other servers complete their migration. The workflows will then automatically start on these servers in the order the workflows were created.
- If this is your first time to create a server migration workflow, you need to delegate MgC the required permissions. For more information about the required permissions, see [Agency Permissions](#).

#### Notes

Before creating a server migration workflow, read and understand the following precautions.

| Item                      | Precaution                                                                                                                                                                                                                                                                                   |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Source download bandwidth | Used to download SMS-Agent to source servers. <ul style="list-style-type: none"><li>• If each source server uses a dedicated bandwidth, the bandwidth must be at least 30 Mbit/s.</li><li>• If source servers share a bandwidth, the average bandwidth must be at least 50 Mbit/s.</li></ul> |
| Migration bandwidth       | <ul style="list-style-type: none"><li>• Used to migrate data. It affects the migration speed and duration.</li><li>• For details about how to estimate the migration duration, see <a href="#">How Long Does a Migration Take?</a></li></ul>                                                 |

| Item                        | Precaution                                                                                                                                                               |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU and memory              | <ul style="list-style-type: none"><li>At least 520 MB of available memory</li><li>At least 0.3 CPUs available in Linux and at least 1 CPU available in Windows</li></ul> |
| OS compatibility            | For details about what OSs are supported, see <a href="#">Supported OSs</a> .                                                                                            |
| Server migration statements | For details about the important statements you need to understand before the migration, see <a href="#">What Are the Important Statements of SMS?</a>                    |
| Notes and constraints       | For details about the notes and constraints for server migration, see <a href="#">Notes and Constraints</a> .                                                            |
| Billing                     | For details about the fees that may be incurred during the migration, see <a href="#">Billing</a> .                                                                      |
| Permissions configuration   | For details about the permissions the target account must have, see <a href="#">Permissions Management</a> .                                                             |
| Migration network and ports | For details about the requirements for the migration network and ports, see <a href="#">How Do I Set Up a Secure Migration Network for Using SMS?</a>                    |

## Prerequisites

- You have [discovered source servers](#).
- Servers to be migrated have been added to an application, and the application servers have been assessed. For details, see [Grouping Resources as Applications](#) and [Getting Target Recommendations](#). After the assessment is complete, you can purchase recommended target servers in batches. For details, see [Purchasing Resources](#). Source servers with target servers associated do not need to be assessed. For details, see [Associating Source Servers with Target Servers](#).

## Procedure

- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select an [application migration project](#) from the drop-down list.
- Step 2** In the navigation pane, choose **Migrate > Workflows**.
- Step 3** Click **Create Workflow** in the upper right corner of the page.
- Step 4** In the **Server Migration** card, click **Preview Steps** to view the steps predefined in the template and the detailed description of each step. If the type of a step is **Automated**, the step is automatically performed by MgC. If the type of a step is **Manual**, you need to perform the step manually. Click **Next: Configure Workflow** in the lower right corner.
- Step 5** Configure the workflow parameters based on [Table 1-49](#).

**Table 1-49** Parameters for configuring a server migration workflow

| Area               | Parameter               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Workflow Details   | Name                    | User-defined                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                    | Description             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                    | Select Source Resources | <ul style="list-style-type: none"> <li>• <b>By application:</b> Servers in the selected application will be migrated together.</li> <li>• <b>By migration plan:</b> Servers in the selected migration plan will be migrated together.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Application        | Application             | If <b>Select Source Resources</b> is set to <b>By application</b> , select the application that contains the servers to be migrated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Migration Plan     | Migration Plan          | If <b>Select Source Resources</b> is set to <b>By migration plan</b> , select the plan that contains the servers to be migrated. For details about how to create a migration plan, see <a href="#">Creating a Server Migration Plan</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Migration Network  | Network Type            | If you select <b>Public</b> , ensure that all target servers have EIPs bound. These EIPs will be used for the migration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                    |                         | <p>If you select <b>Private</b>, configure Direct Connect connections, VPN connections, VPC peering connections, or subnets in the target VPC in advance to ensure that the source environment can access the target environment.</p> <ul style="list-style-type: none"> <li>• If the source environment does not have direct Internet access, you need to enter the private IP address of the source proxy server and the port used by the proxy software.</li> <li>• If the source proxy server cannot access the Internet, put the SMS-Agent installation package at a location where the source servers can access directly or over a proxy. You can download the SMS-Agent installation package from the SMS console.</li> </ul> |
| Target Environment | Region                  | The target region. It defaults to the one you selected when you assessed the application.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                    | Project                 | A project in the target region.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Area | Parameter      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | VPC            | <ul style="list-style-type: none"> <li>• If the source IP address is 192.168.X.X, you are advised to create a VPC and a subnet that both belong to network range 192.168.0.0/16.</li> <li>• If the source IP address is 172.16.X.X, you are advised to create a VPC and a subnet that both belong to network range 172.16.0.0/12.</li> <li>• If the source IP address is 10.X.X, you are advised to create a VPC and a subnet that both belong to network range 10.0.0.0/8.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|      | Subnet         | The subnet has to be in the same network segment as the VPC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|      | Security Group | <ul style="list-style-type: none"> <li>• If there are Windows source servers, the security group must allow access on ports 8899, 8900, and 22.</li> <li>• If there are Linux source servers, the security group must allow access on port 22.</li> </ul> <p><b>CAUTION</b></p> <ul style="list-style-type: none"> <li>- For security purposes, you are advised to only allow traffic from the source servers on these ports.</li> <li>- The firewall of the target servers must allow traffic to these ports.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|      | Migration Port | <p>It defaults to 22. If port 22 is occupied, you can use one from 10000 to 65535.</p> <p><b>CAUTION</b></p> <p>The following ports cannot be used as the migration port:</p> <p>135, 139, 445, 5357, 5985, 5986, 8899, 8900, 47001, 49664, 49665, 49666, 49668, 49669, 49671, 49674, 49677, 49679, 49680, 49681, 49682, 49683, 49685, 49690, 49691, 49693, 49694, 49695, 49698, 49699, 49700, 49702, 49703, 49704, 49705, 49706, 49707, 49708, 49709, 49710, 49711, 49712, and 49713</p> <p>Make sure the entered port is not in the blacklist and is not being used by other services on the source server. Additionally, check that the network environment allows traffic to this port.</p> <p>The functions of the port are as follows:</p> <ul style="list-style-type: none"> <li>• For Linux servers, this port is used to establish transmission channels and transmit data.</li> <li>• For Windows servers, this port is used to establish transmission channels.</li> </ul> |

| Area | Parameter         | Description                                                                                                                |
|------|-------------------|----------------------------------------------------------------------------------------------------------------------------|
|      | Control Port      | This port is used to transmit task control signals for Windows servers. It defaults to 8899 and cannot be changed.         |
|      | Transmission Port | This port is used to transmit data for Windows servers. It defaults to 8900 and cannot be changed.                         |
|      | Encryption        | If you select <b>No</b> , the system and data disks will not be encrypted for target server newly created in the workflow. |

| Area | Parameter | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |           | <p>If you select <b>Yes</b>, the system and data disks will be encrypted for target servers newly created in the workflow.</p> <p><b>NOTICE</b></p> <ul style="list-style-type: none"> <li>• This setting does not apply to existing target servers associated with the source servers.</li> <li>• This setting applies to all target servers newly created by the workflow. The disks on these new target servers will be encrypted using the same key.</li> <li>• The encryption attribute of a disk cannot be modified after the disk is created.</li> <li>• Keys can be shared with accounts, not users.</li> </ul> <p>To enable disk encryption, you need to create an agency to authorize EVS to access KMS. If you have the right to grant the permissions, grant the KMS access permissions to EVS directly. After the authorization succeeds, you do not need to perform the authorization again. If you do not have the right to grant the permissions, contact a user with the Security Administrator permissions to grant you the right and then repeat the preceding operations. After the authorization is successful, configure the following parameters:</p> <ul style="list-style-type: none"> <li>• Select an existing key           <p><b>NOTICE</b><br/>Only enabled keys generated using the AES_256 encryption algorithm are supported.</p> <p>Select a key from the drop-down list. You can select one of the following keys:</p> <p>Default keys: After the KMS access permissions have been granted to EVS, the system automatically creates a default key and names it <b>evs/default</b>.</p> <p>Custom keys: You can choose an existing key or create a new one. For details about how to create a key, see <a href="#">Creating a Key</a>.</p> </li> <li>• Enter a key ID           <p>Enter the ID of a key shared from another user. Ensure that the key is in the target region. For details, see <a href="#">Creating a Grant</a>.</p> </li> </ul> |

| Area              | Parameter                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Advanced Settings | Verify Data Consistency      | <ul style="list-style-type: none"> <li>• If you select <b>Yes</b>, the system will automatically verify data consistency after the full replication is complete. This is a quick verification, and only the file size and last modification time will be verified. You can modify the verification policy after the incremental synchronization is complete.</li> <li>• If you select <b>No</b>, data consistency will not be verified after the full replication is complete. You can modify the verification policy after the incremental synchronization is complete.</li> </ul> |
|                   | Start Target After Migration | <ul style="list-style-type: none"> <li>• If you select <b>No</b>, the target servers will be stopped after the migration is complete.</li> <li>• If you select <b>Yes</b>, the target servers will be started after the migration is complete.</li> </ul>                                                                                                                                                                                                                                                                                                                           |
|                   | Set Bandwidth Limit          | <ul style="list-style-type: none"> <li>• If you select <b>No</b>, the migration traffic is not limited.</li> <li>• If you select <b>Yes</b>, you can limit the bandwidth that can be used for migration based on the source bandwidth and service requirements.</li> </ul> <p><b>CAUTION</b><br/>Consider the migration scale to set an appropriate bandwidth limit. If a too small bandwidth is allocated to the workflow that includes 10 servers, migration tasks in the workflow may preempt the limited bandwidth resource, and some servers may fail to be migrated.</p>      |
|                   | Install rsync on Source      | <ul style="list-style-type: none"> <li>• If you select <b>No</b>, the rsync component will not be installed on the source servers.</li> <li>• If you select <b>Yes</b>, the rsync component will be automatically installed on the source servers.</li> </ul> <p><b>CAUTION</b><br/>Linux migrations depend on rsync. If rsync is not installed on a source server, the server will fail to be migrated.</p>                                                                                                                                                                        |
|                   | Retain IP Address            | <p>Enable this option to retain the private IP addresses of the source servers on the target servers. Enabling it may cause risks. You need to evaluate and take responsibility for any potential risks.</p>                                                                                                                                                                                                                                                                                                                                                                        |

| Area | Parameter          | Description                                                                                                                                                                                                                                                                                             |
|------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Enable Quick Mode  | Enable this option if incremental synchronization is not required. This option is disabled by default. If it is enabled, incremental synchronization is skipped and then subsequent steps are performed after full replication is complete in the workflow. Set this option based on your requirements. |
|      | Enterprise Project | Select the enterprise project you want to migrate to. The enterprise project <b>default</b> is selected by default.                                                                                                                                                                                     |

**Step 6** Click **Next: Confirm**.

**Step 7** Confirm the workflow settings and click **Confirm**. The **Run Workflow** dialog box is displayed, which indicates that the workflow has been created.

- If you want to start the migration immediately, click **Confirm** to run the workflow.
- If you want to [add a stage or step](#) to the workflow, click **Cancel**. The workflow enters a **Waiting** state, and the migration is not started. To start the migration, click **Run** in the **Operation** column.

**Step 8** On the migration workflow details page, view the workflow settings and the migration progress. After the step for starting the migration Agent is completed, a migration task is automatically created on the SMS console. For details about the server information mapping between MgC and SMS, see [What Are the Information Mappings Between MgC and SMS?](#)

- Move the cursor to the migration progress bar. In the box that is displayed, view more migration details.
- When the migration progress bar reaches a step that requires manual confirmation, move the cursor to the progress bar and click **Confirm** next to the step status in the displayed window, so that the subsequent migration steps can be executed.
- When the workflow reaches the **ResizeDiskPartition** step, the system identifies whether disk capacity reduction has been performed on the target server.
  - If yes, go to [SMS console](#) and resize disks and partitions for the target server. For details, see the **Partition Resizing** parameter in [Configuring a Target Server](#). After the adjustment is complete, go back to the MgC console and click **Confirm** next to the step status so that the workflow can continue.
  - If no, skip this step.
- The **StartSynchronization** step is repeated before you verify your services on the target server.
- When the progress bar reaches **Cutover**, the migration is complete. You need check whether your service systems are running properly on the target server. If they are, manually switch services to the target server. After the switchover



is complete, click **Confirm** in the workflow. The system automatically performs the following steps **SourceClear** and **MigrationTaskClear**.

----End

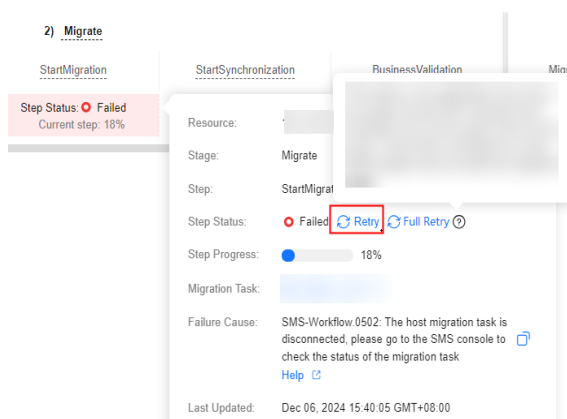
## When to Use the Retry and Full Retry Buttons

During the running of the server migration workflow, the MgC Agent (formerly Edge) launches an SMS-Agent migration process on each source server. After the process is started, it communicates with the SMS console and receives commands to perform migration. During the **StartMigration** and **StartSynchronization** steps in the workflow, if the SMS-Agent process on a source server disconnects from the SMS console, the MgC console will detect the disconnection, causing the migration workflow to fail on that source server. On the migration workflow details page, you will see options **Retry** and **Full Retry**. The appropriate choice depends on the cause of the disconnection. The possible causes for the disconnection include:

- **Possible cause 1:** There is a network exception.

In this case, the SMS-Agent process still opens on the source server. You only need to restore the network, wait until the connection to the SMS console is restored, and click **Retry** to resume the migration.

Figure 1-47 Retry



Command for checking the SMS-Agent process on Linux:

```
ps -ef | grep -v grep | grep linuxmain
```

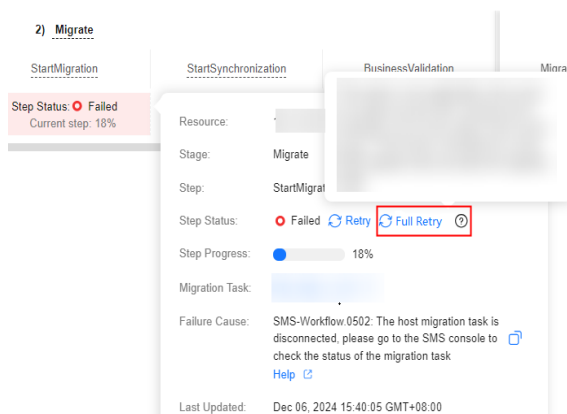
Command for checking the SMS-Agent process on Windows:

```
Get-Process -Name SMSAgentDeploy -ErrorAction SilentlyContinue
```

- **Possible cause 2:** The SMS-Agent process is stopped due to a restart of the source server.

In this case, the SMS-Agent process is stopped, and the migration cannot be resumed. You need to create an SMS migration task again by clicking the **Full Retry** button. After the migration task is cleared, the workflow starts from the **StartUpAgent** step to restart the SMS-Agent process on the source server and create an SMS migration task again.

**Figure 1-48 Full Retry**



**CAUTION**

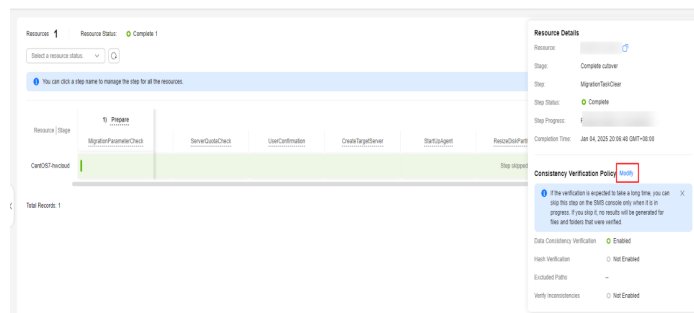
Clicking the **Full Retry** button will delete the original migration task and create a new one. The migrated data will be overwritten.

## Modifying the Data Consistency Check Policy After Incremental Synchronization Is Complete

After incremental synchronization is complete, you can modify the consistency verification policy.

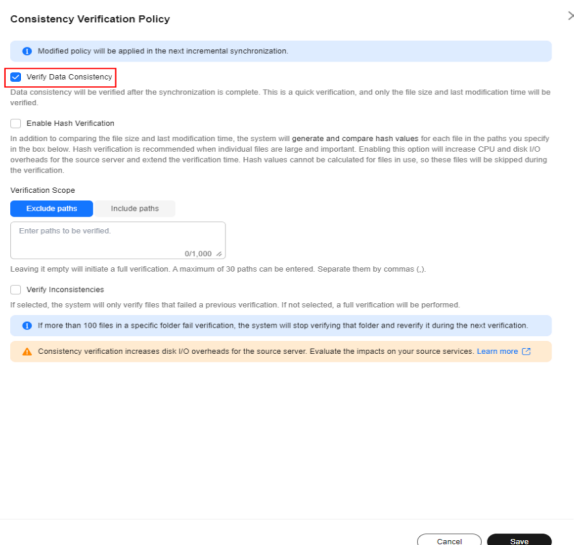
- Step 1** Move the cursor to the progress bar. In the dialog box, click **Modify** next to **Consistency Verification Policy**.

**Figure 1-49** Modifying the consistency verification policy



- Step 2** Select **Verify Data Consistency** and configure the verification policy based on [Table 1-50](#).

**Figure 1-50** Configuring the consistency verification policy



**Table 1-50** Parameters for configuring the consistency verification policy

| Parameter                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Enable Hash Verification | <p>If this option is enabled, the system will generate and compare hash values for each file to be verified. Hash verification is recommended when individual files are large and important. Enabling this option will increase CPU and disk I/O overheads for the source server and extend the verification time.</p> <p><b>CAUTION</b></p> <ul style="list-style-type: none"> <li>Hash values cannot be calculated for files in use, so these files will be skipped during the verification.</li> <li>Enabling this option requires you to specify the verification scope, and only files in the specified scope will be verified.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Verification Scope       | <ul style="list-style-type: none"> <li>Under <b>Exclude paths</b>, enter the paths you want to exclude from the verification. A maximum of 30 paths can be entered. Use commas (,) to separate the paths. For example, <b>/root/data,/var</b>. Leaving it empty will initiate a full verification.</li> <li>Under <b>Include paths</b>, enter the paths you want to verify.</li> </ul> <p><b>NOTICE</b></p> <ul style="list-style-type: none"> <li>If the entered paths are incorrect or empty, 0 will be displayed for them in the verification results.</li> <li>The more data you need to verify, the longer the verification will take. It is wise to narrow the verification scope to only key paths.</li> <li>The following paths will be excluded from consistency verification by default: <ul style="list-style-type: none"> <li>Linux: <b>/bin, /boot, /dev, /home, /etc, /lib, /media, /proc, /sbin, /selinux, /sys, /usr, /var, /run, and /tmp</b></li> <li>Windows: top-level directories of partitions, for example, <b>C:\</b> and <b>D:\</b>.</li> </ul> </li> </ul> |

| Parameter              | Description                                                                              |
|------------------------|------------------------------------------------------------------------------------------|
| Verify Inconsistencies | This option can only be enabled after at least one consistency verification is complete. |

**Step 3** Click **Save**. After the incremental synchronization is complete, the system will automatically verify data consistency.

**Step 4** After the synchronization and verification are complete, go to the SMS console and [view the verification results](#).

----End

### 1.10.3 Creating a Cross-AZ Migration Workflow

This section describes how to create a cross-AZ migration workflow using the standard template.

#### Prerequisites

- You have [discovered source servers](#).
- Servers to be migrated have been added to an application, and the application servers have been assessed or associated with existing target servers. For details, see [Grouping Resources as Applications](#) and [Getting Target Recommendations](#).

#### Procedure

**Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select an [application migration project](#) from the drop-down list.

**Step 2** In the navigation pane, choose **Migrate > Workflows**.

**Step 3** Click **Create Workflow** in the upper right corner of the page.

**Step 4** In the **Cross-AZ Migration** card, click **Preview Steps** to view the steps predefined in the template and the detailed description of each step. If the type of a step is **Automated**, the step is automatically performed by MgC. If the type of a step is **Manual**, you need to perform the step manually. Click **Configure Workflow** in the lower right corner.

**Step 5** Configure the workflow parameters listed in [Table 1-51](#).

**Table 1-51** Parameters required for creating a cross-AZ migration workflow

| Region           | Parameter   | Description                                                       |
|------------------|-------------|-------------------------------------------------------------------|
| Workflow Details | Name        | Enter a workflow name.                                            |
|                  | Description | Describe the workflow.                                            |
| Application      | Application | Select the application which contains the servers to be migrated. |

| Region             | Parameter                       | Description                                                                                                                                                                                                                                                                                                                           |
|--------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Migration Settings | Target Region                   | Select the region where the source AZ is located. The region configured in the application is populated by default.                                                                                                                                                                                                                   |
|                    | Target AZ                       | Select the AZ you want to migrate to. The configuration must be the same as that of the created application.                                                                                                                                                                                                                          |
|                    | Target Network                  | Only <b>Retain original</b> is available.                                                                                                                                                                                                                                                                                             |
|                    | Target Server                   | Create now.<br>MgC creates backups and images for source servers, and uses the images to create target servers immediately after the workflow runs.                                                                                                                                                                                   |
|                    | Stop Target Server              | <ul style="list-style-type: none"> <li>• If you select <b>Yes</b>, target servers will be stopped after being created.</li> <li>• If you select <b>No</b>, target servers will be started after being created.</li> </ul>                                                                                                             |
|                    | Stop Source Server              | <ul style="list-style-type: none"> <li>• If you select <b>Yes</b>, source servers will be stopped before incremental backups are created for them. This ensures data consistency as high as possible.</li> <li>• If you select <b>No</b>, source servers remain running when incremental backups are created for them.</li> </ul>     |
|                    | Create System Disk Image        | <ul style="list-style-type: none"> <li>• If you select <b>Yes</b>, a system disk image will be created for each of the source servers. The images can be used to reinstall the OS for the paired target servers.</li> <li>• If you select <b>No</b>, the system will not create system disk images for the source servers.</li> </ul> |
| Advanced Settings  | Delete Intermediate Resources   | If this function is enabled, intermediate resources generated during the migration, such as backups, snapshots, and images, will be deleted after the service cutover is complete.                                                                                                                                                    |
|                    | Retain Primary NIC IP Addresses | If this function is enabled, the private and public IP addresses of the primary NIC on source servers will be retained on target servers, and random private IP addresses will be allocated to source servers. If a rollback is needed, it has to be performed manually.                                                              |

**Step 6** Click **Next: Confirm**.

**Step 7** Confirm the workflow settings and click **Confirm**. The **Run Workflow** dialog box is displayed, which indicates that the workflow has been created.

- If you want to start the migration immediately, click **Confirm** to run the workflow.
- If you want to [add a stage or step](#) to the workflow, click **Cancel**. The workflow enters a **Waiting** state, and the migration is not started. To start the migration, click **Run** in the **Operation** column.

**Step 8** On the migration workflow details page, view the workflow settings and the migration progress.

- Move the cursor to the migration progress bar. In the box that is displayed, view more migration details.
- When the migration progress bar reaches a step that requires manual confirmation, move the cursor to the progress bar and click **Confirm** next to the step status in the displayed window, so that the subsequent migration steps can be executed.

----End

## 1.10.4 Creating a Storage Migration Workflow

This section describes how to create a storage migration workflow from the predefined template.

The following regions are supported:

- LA-Santiago
- LA-Sao Paulo
- TR-Istanbul
- AP-Bangkok
- AP-Singapore
- AP-Jakarta
- ME-Riyadh
- CN North-Beijing4
- CN East-Shanghai1

### Notes and Constraints

- For more information, see [What Are the Restrictions on Using MgC for Storage Migration?](#)
- Data in the Deep Cold Archive storage of Alibaba Cloud OSS cannot be restored using the restoration function of MgC. You need to manually restore the data before migration.

### Warnings

When you create a workflow, there are three options for **Overwrite Existing**: **Never**, **Always**, and **If older or different size**. If you choose **Never**, restarting the migration task after interruptions or pauses may cause incomplete data migration, but the task may still be displayed as successful, which affects data integrity. Use the **Never** option with caution.

## Prerequisites

- You have created an [OBS bucket](#) or [SFS file system](#) on Huawei Cloud.
- You have [created a migration cluster](#).

## Procedure

- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select an [application migration project](#) from the drop-down list.
- Step 2** In the navigation pane, choose **Migrate > Workflows**.
- Step 3** Click **Create Workflow** in the upper right corner of the page.
- Step 4** In the **Storage Migration** card, click **Preview Steps** to view the stages and steps predefined in the template and the detailed description of each stage and step. Steps of the **Automated** type will be automatically performed by MgC. Click **Configure Workflow** in the lower right corner.
- Step 5** Set workflow basics based on [Table 1-52](#).

**Table 1-52** Basic parameters

| Parameter   | Description                                                                                                                                                                                                                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name        | Enter a workflow name.                                                                                                                                                                                                                                                                                |
| Region      | Select a region you are migrating to.                                                                                                                                                                                                                                                                 |
| Description | Enter a description.                                                                                                                                                                                                                                                                                  |
| Cluster     | Select a migration cluster. The cluster consists of a master node and several migration and list nodes. If no cluster is available, <a href="#">create a cluster</a> .<br><b>NOTICE</b><br>A master node is created by the system in a migration cluster by default. You do not need to configure it. |

- Step 6** Configure the migration source and target based on [Table 1-53](#) and [Table 1-54](#).

**Table 1-53** Parameters for configuring a migration source

| Parameter     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Remarks                                                                                         |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Location Type | <p>The supported migration sources include:</p> <ul style="list-style-type: none"> <li>● Huawei Cloud OBS</li> <li>● Alibaba Cloud OSS</li> <li>● Baidu Cloud BOS</li> <li>● Tencent Cloud COS</li> <li>● Kingsoft Cloud KS3</li> <li>● Qiniu Cloud KODO</li> <li>● UCloud US3</li> <li>● Amazon S3</li> <li>● Azure Blob Storage</li> <li>● NAS_GFS</li> <li>● NAS_SMB</li> <li>● NAS_NFS_V3_MOUNT</li> <li>● NAS_NFS_V3_PROTOCOL</li> <li>● HTTP/HTTPS data source</li> </ul> | -                                                                                               |
| AK            | Enter the AK of the source cloud account.                                                                                                                                                                                                                                                                                                                                                                                                                                       | These parameters are available when cloud storage is selected for <b>Location Type</b> .        |
| SK            | Enter the SK of the source cloud account.                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                 |
| Bucket        | Enter the name of the source bucket to be migrated.                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                 |
| Endpoint      | <p>Enter the endpoint of the region where the source bucket is located.</p> <p>For example, if <b>Location Type</b> is set to <b>Alibaba Cloud OSS</b> and the source bucket is located in <b>CN East 1 (Hangzhou)</b>, enter <b>oss-cn-hangzhou.aliyuncs.com</b>.</p>                                                                                                                                                                                                          |                                                                                                 |
| Type          | Set this parameter based on the source bucket type. You can <a href="#">view the bucket type in the basic information</a> .                                                                                                                                                                                                                                                                                                                                                     | This parameter is available when <b>Huawei Cloud OBS</b> is selected for <b>Location Type</b> . |




| Parameter           | Description                                                                                                                                                                                                                                                                                     | Remarks                                                                                           |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| APPID               | Enter the APPID of your Tencent Cloud account.<br><b>NOTE</b><br>You can view the APPID on the account information page of the Tencent Cloud console.                                                                                                                                           | This parameter is available when <b>Tencent Cloud COS</b> is selected for <b>Location Type</b> .  |
| Authentication Type | The following authentication types are supported: <ul style="list-style-type: none"> <li>• Connection string</li> <li>• Storage account name and key</li> </ul> For details about how to obtain the credentials, see <a href="#">How Do I Obtain Credentials for Accessing Microsoft Azure?</a> | This parameter is available when <b>Azure Blob Storage</b> is selected for <b>Location Type</b> . |

| Parameter | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Remarks                                                                                                  |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| List Path | <p>Enter the path where the lists of files to be migrated are stored. These lists must be stored in the same region as the target bucket. You need to write the URLs of files to be migrated and their new names at the target into the lists. Each line in the list can contain only one URL and one file name.</p> <p>Restrictions on list files are:</p> <ul style="list-style-type: none"><li>• The files must be in .txt format, and their metadata <b>Content-Type</b> must be <b>text/plain</b>.</li><li>• A single file can contain a maximum of 100,000 rows.</li><li>• A single file cannot exceed 300 MB.</li><li>• A maximum of 10,000 list files can be stored in the folder.</li><li>• The files must be in UTF-8 without BOM.</li><li>• The length of each line in a file cannot exceed 65,535 characters, or the migration will fail.</li><li>• The <b>Content-Encoding</b> metadata of the files must be left empty, or the migration will fail.</li><li>• In the files, a tab character (\t) must be used to separate the URL and new file name in each line. The format is [URL] [Tab character][New file name]. Only the Chinese and special characters in the names must be URL encoded.</li><li>• Spaces are not allowed in each line in a file. Spaces may cause migration failures because they may be mistakenly identified as object names.</li></ul> <p><b>NOTE</b></p> <p>For security purposes, if the migration source supports both HTTP and HTTPS, you are advised to use HTTPS for the migration. If HTTP is used, data may be eavesdropped on, tampered with, or vulnerable to man-in-the-middle or replay attacks.</p> | These parameters are available when <b>HTTP/HTTPS data source</b> is selected for <b>Location Type</b> . |

| Parameter           | Description                                                                                                                                                | Remarks                                                                                                                                       |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| File System Address | Enter the mount address of the source file system. The format is <i>IP address:/</i> or <i>IP address:/xxx</i> , for example, 192.1.1.1:/0001.             | These parameters are available when <b>Location Type</b> is set to <b>NAS_SMB</b> , <b>NAS_NFS_V3_MOUNT</b> , or <b>NAS_NFS_V3_PROTOCOL</b> . |
| Path                | Enter the directory where files to be migrated are located. The format is <i>/Folder name</i> .                                                            |                                                                                                                                               |
| Username            | Enter the username of the account that can access all files in the source file system, for example, <b>administrator</b> .                                 | These parameters are available when <b>Location Type</b> is set to <b>NAS_SMB</b> .                                                           |
| Password            | Enter the password of the account.                                                                                                                         |                                                                                                                                               |
| Domain on Windows   | Enter the corresponding domain name.<br><b>NOTE</b><br>You only need to enter the content before .com. For example, if the domain is test.com, enter test. |                                                                                                                                               |

**Table 1-54** Parameters for configuring a migration target

| Parameter     | Description                                                                                                                                                                                                                                                                                                                                     | Remarks                                                                                      |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Location Type | Select Huawei Cloud storage based on the source storage type.                                                                                                                                                                                                                                                                                   | -                                                                                            |
| AK            | Enter the AK of the Huawei Cloud account you are migrating to.                                                                                                                                                                                                                                                                                  | These parameters are available when <b>Location Type</b> is set to <b>Huawei Cloud OBS</b> . |
| SK            | Enter the SK of the Huawei Cloud account you are migrating to.                                                                                                                                                                                                                                                                                  |                                                                                              |
| Bucket        | Select the OBS bucket you are migrating your data to.                                                                                                                                                                                                                                                                                           |                                                                                              |
| Endpoint      | Enter the endpoint of the region where the target OBS bucket is located. For example, if the target bucket is located in the <b>CN North-Beijing4</b> region of Huawei Cloud, enter <b>obs.cn-north-4.myhuaweicloud.com</b> .<br><b>NOTE</b><br>If the migration source is an OBS bucket, you can view the endpoint in the OBS bucket overview. |                                                                                              |

| Parameter           | Description                                                                                                                                                                                                                                                                                                                                     | Remarks                                                                                                        |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Specify Prefix      | Specify a prefix to rename or relocate objects migrated to the target bucket. For example, if you specify the prefix <b>/D</b> , source file <b>/A/B/C.txt</b> will be relocated to <b>/D/A/B/C.txt</b> after being migrated to the target bucket. For details, see:<br><a href="#">Adding a Name Prefix or Path Prefix to Migrated Objects</a> |                                                                                                                |
| File System Address | Enter the mount address of the target file system. To obtain the mount address, go to the file system list and click the  icon next to the address in the <b>Mount Point</b> column.                                                                           | These parameters are available when <b>Location Type</b> is set to <b>NAS_SMB</b> or <b>NAS_NFS_V3_MOUNT</b> . |
| Path                | Enter the directory for storing files migrated. The format is <i>/Folder name</i> .                                                                                                                                                                                                                                                             |                                                                                                                |
| Username            | Enter the username of the account that can access all files in the target file system, for example, <b>administrator</b> .                                                                                                                                                                                                                      | These parameters are available when <b>Location Type</b> is set to <b>NAS_SMB</b> .                            |
| Password            | Enter the password of the account.                                                                                                                                                                                                                                                                                                              |                                                                                                                |
| Domain on Windows   | Enter the corresponding domain name.<br><b>NOTE</b><br>You only need to enter the content before .com. For example, if the domain is test.com, enter test.                                                                                                                                                                                      |                                                                                                                |

**Step 7** Configure the migration task based on [Table 1-55](#).

**Table 1-55** Parameters for configuring a migration task

| Parameter | Value          | Description                                                |
|-----------|----------------|------------------------------------------------------------|
| Task Type | Full migration | Migrates all data in the source bucket or specified paths. |

| Parameter | Value            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | List migration   | <p>Migrates files recorded in the list files.</p> <p>In <b>List Path</b> box, enter the path of the object lists stored in the target bucket. Restrictions on an object list file vary with the target location.</p> <ul style="list-style-type: none"> <li>● Target location: Huawei Cloud OBS <ul style="list-style-type: none"> <li>- An object list file cannot exceed 30 MB.</li> <li>- An object list file must be a .txt file, and the Content-Type metadata must be text/plain.</li> <li>- An object list file must be in UTF-8 without BOM.</li> <li>- Each line in an object list file can contain only one object name, and the object name must be URL encoded.</li> <li>- Each line in an object list file cannot exceed 16 KB, or the migration will fail.</li> <li>- The Content-Encoding metadata of an object list file must be left empty, or the migration will fail.</li> <li>- An object list file can contain a maximum of 10,000 lines.</li> </ul> </li> <li>● Target location: NAS <ul style="list-style-type: none"> <li>- An object list file cannot exceed 30 MB.</li> <li>- An object list file must be a .txt file.</li> <li>- An object list file must be in UTF-8 without BOM.</li> <li>- Each line in an object list file can contain only one object name, and the object name must be URL encoded.</li> <li>- Each line in an object list file cannot exceed 16 KB, or the migration will fail.</li> <li>- An object list file can contain a maximum of 10,000 lines.</li> </ul> </li> </ul> |
|           | Prefix migration | <p>This option is only available for migration from cloud storage.</p> <p>If you enter a file name or name prefix in the <b>Prefix</b> box, only the objects that exactly match the specified name or prefix are migrated.</p> <p><b>NOTICE</b></p> <ul style="list-style-type: none"> <li>● If the files to be migrated are stored in the root directory of the source bucket, add their name prefixes directly. If the files are stored in a non-root directory, add their directories and name prefixes in the format of <i>Directory/Prefix</i>.</li> <li>● Use commas (,) to separate multiple prefixes.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Parameter           | Value                       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Concurrent Subtasks | -                           | Specify the maximum number of concurrent subtasks. There cannot be more than 10 concurrent subtasks for each online migration node. For example, if there are 2 online migration nodes, the maximum number of subtasks can be 20 or any number below.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Overwrite Existing  | Never                       | Files existing at the target will never be overwritten.<br><b>WARNING</b> <ul style="list-style-type: none"> <li>If you choose <b>Never</b> for the initial migration, the attributes of involved parent folders at the source will not be migrated to the target. As a result, the folder attributes may be incomplete at the target. To avoid this issue, use the <b>Never</b> option with caution for the initial migration.</li> <li>If a migration task is paused or interrupted and then restarted or resumed, the <b>Never</b> option will cause the system to skip files that were not completely migrated earlier, but the task may still be marked as successful. This affects data integrity. To avoid this issue, use the <b>Never</b> option with caution.</li> </ul> |
|                     | Always                      | Files existing at the migration target will always be overwritten.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                     | If older or different size  | <ul style="list-style-type: none"> <li>Files that already exist at the target will be overwritten if they are older than or have different sizes from the paired files at the source.</li> <li>Verification will be performed for folders after their contents are migrated. Folders that already exist at the target will be overwritten if they have different last modification times, sizes, or permissions from the paired folders at the source.</li> </ul> <b>NOTE</b><br>The same overwriting policy is applied to empty folders as files.                                                                                                                                                                                                                                 |
|                     | If different CRC64 checksum | <ul style="list-style-type: none"> <li>If a source object has a CRC64 checksum different from the paired target object, the source object will overwrite the target one. Otherwise, the source object will be skipped during the migration. If either of them does not have a CRC64 checksum, their sizes and last modification times are checked.</li> </ul> <b>NOTE</b> <ul style="list-style-type: none"> <li>This option is only available for migration on Huawei Cloud or from Alibaba Cloud or Tencent Cloud.</li> <li>Using this option requires that the target OBS bucket be added to the CRC64 feature whitelist.</li> </ul>                                                                                                                                            |

| Parameter         | Value                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Consistency Check | Size and last modified | With this default method, the system checks data consistency by comparing object size and last modification time.                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                   | CRC 64 checksum        | The system verifies data consistency by comparing CRC64 values in the metadata. If a source object and the paired destination object have CRC64 checksums, the checksums are checked. Otherwise, their sizes and last modification times are checked.<br><b>NOTE</b> <ul style="list-style-type: none"> <li>This option is only available for migration on Huawei Cloud or from Alibaba Cloud or Tencent Cloud.</li> <li>Using this option requires that the target OBS bucket be added to the CRC64 feature whitelist.</li> </ul> |
| Migrate Metadata  | -                      | Decide whether to migrate metadata. <ul style="list-style-type: none"> <li>If you select this option, object metadata will be migrated.</li> <li>If you do not select this option, only the Content-Type and Content-Encoding metadata will be migrated.</li> </ul>                                                                                                                                                                                                                                                                |
| Clear Cluster     | -                      | Determine whether to clear the migration cluster after the migration is complete. <ul style="list-style-type: none"> <li>If you select this option, a step for clearing the migration cluster will be created in the workflow. You can also choose whether to clear resources used by the cluster, such as NAT gateways, security groups, and VPCEP resources.</li> <li>If you do not select this option, a step for clearing the migration cluster will not be created in the workflow.</li> </ul>                                |

**Step 8** (Optional) Configure advanced options based on [Table 1-56](#).

**Table 1-56** Advanced options

| Parameter            | Description                                                                                                                                                                | Remarks |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Target Storage Class | Choose the storage class that your data will be migrated to in the target bucket. For details about storage classes, see <a href="#">Introduction to Storage Classes</a> . | -       |

| Parameter              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Remarks                                                              |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Enable KMS Encryption  | <ul style="list-style-type: none"> <li>If you do not select this option, whether migrated data will be encrypted in the target bucket depends on the server-side encryption setting of the bucket.</li> <li>If you select this option, all migrated objects will be encrypted before they are stored in the target bucket.</li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>Using KMS to encrypt migrated data may slow down the migration speed by about 10%.</li> <li>This option is only available when KMS is supported in the region you are migrating to.</li> </ul>                                                                                                                                                                  | This parameter is only available for migrations to Huawei Cloud OBS. |
| Restore Archive Data   | <ul style="list-style-type: none"> <li>If you do not select this option, the system directly records archive objects in the list of objects that failed to be migrated and continues to migrate other objects in the migration task.</li> <li>If you select this option, the system automatically restores and migrates archive objects in the migration task. If an archive object fails to be restored, the system skips it and records it in the list of objects that failed to be migrated and continues to migrate other objects in the migration task.</li> </ul> <p><b>NOTE</b></p> <p>The system will restore archive data before migrating it, and you pay the source cloud platform for the API requests and storage space generated accordingly.</p> | -                                                                    |
| Filter Source Data     | Filter files to be migrated by applying filters. For details about the filters, see <a href="#">Source Data Filters</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                      |
| Download Data from CDN | <p>If the default domain name cannot meet your migration requirements, then as long as the source cloud service provider supports custom domain names, you can bind a custom domain name to the source bucket, and enable the CDN service on the source platform to reduce data download expenses. Enter a custom domain name in the <b>Domain Name</b> text box and select a transmission protocol. HTTPS is more secure than HTTP and is recommended.</p> <p>If the migration source is the Alibaba Cloud OSS or Tencent Cloud COS, you also need to select an authentication type and enter an authentication key.</p>                                                                                                                                       |                                                                      |



| Parameter             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Remarks |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Send SMN Notification | <p>Determine whether to use SMN to get notifications about migration results.</p> <ul style="list-style-type: none"> <li>• If you do not select this option, no SMN messages are sent after the migration.</li> <li>• If you select this option, after the migration, SMN messages are sent to the subscribers of the selected topic. You can select the language and trigger conditions for sending messages.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |
| Limit Traffic         | <p>Allocate the maximum bandwidth to be used by the workflow during a specified period.</p> <ul style="list-style-type: none"> <li>• If you do not select this option, migration traffic is not limited.</li> <li>• If you select this option, limit the migration traffic by setting <b>Start Time</b>, <b>End Time</b>, and <b>Bandwidth Limit</b>.<br/>For example, if you set <b>Start Time</b> to <b>08:00</b>, <b>End Time</b> to <b>12:00</b>, and <b>Bandwidth Limit</b> to <b>20 MB/s</b>, the maximum migration speed is limited to 20 MB/s when the migration task runs from 08:00 to 12:00. The migration speed is not limited beyond this period.</li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>- The rate limit ranges from 0 MB/s to 1,048,576 MB/s.</li> <li>- A maximum of five rules can be added.</li> <li>- The time is the local standard time of the region you are migrating to.</li> </ul> | -       |
| Schedule Migration    | <p>Schedule the migration to automatically run during a period.</p> <ul style="list-style-type: none"> <li>• If you do not select this option, you need to manually start or stop the migration.</li> <li>• If you select this option, the migration runs during the specified period and stops beyond that period.<br/>For example: <ul style="list-style-type: none"> <li>- If you set <b>Start Time</b> to <b>08:00</b> and <b>End Time</b> to <b>12:00</b>, the migration task runs from 08:00 to 12:00 every day. The migration stops beyond that period.</li> <li>- If you set <b>Start Time</b> to <b>12:00</b> and <b>End Time</b> to <b>08:00</b>, the migration runs from 12:00 of the current day to 08:00 of the next day. The migration stops beyond that period.</li> </ul> </li> </ul>                                                                                                                                     | -       |

**Step 9** Click **Next: Confirm**.

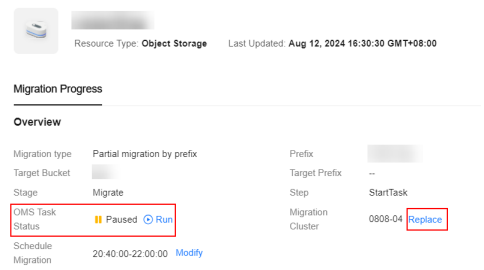
**Step 10** Confirm the workflow settings and click **Confirm**. The **Run Workflow** dialog box is displayed, which indicates that the workflow has been created.

- If you want to start the migration immediately, click **Confirm** to run the workflow.
- If you want to **add a stage or step** to the workflow, click **Cancel**. The workflow enters a **Waiting** state, and the migration is not started. To start the migration, click **Run** in the **Operation** column.

**Step 11** On the migration workflow details page, view the workflow settings and the migration progress. You can also perform the following operations:

- Move the cursor to the migration progress bar of a resource. In the displayed window, view the migration details about the resource.
- When a migration reaches a step that requires manual confirmation, place the cursor on the progress bar and click **Confirm** next to the step status in the displayed window. The migration can continue only after you confirm.
- In the **Basic Information** area, click **Manage** next to the cluster name. The cluster details page is displayed on the right. On the displayed page, you can:
  - Add, edit, or delete traffic limiting rules to control cluster traffic based on your requirements.
  - Add or delete migration nodes or list nodes, or upgrade plug-ins for existing nodes as required.

**Step 12** (Optional) Click the migration progress bar or click **Migration Progress** in the window displayed when you move the cursor to the progress bar. The migration details page is displayed on the right. You can view the task overview and progress details. You can also perform the following operations:

| Operation                            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Change the migration cluster.</p> | <p>You can change the migration cluster only when the migration task (workflow) is <b>Paused</b>.</p>  <p>1. In the <b>Overview</b> area, click <b>Replace</b> next to the migration cluster name.</p> <p>2. In the displayed dialog box, select a new cluster from the drop-down list and click <b>Confirm</b>. After the cluster is changed, the workflow starts to run automatically.</p> |

| Operation                                                               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Modify the migration schedule.                                          | <ol style="list-style-type: none"> <li>In the <b>Overview</b> area, click <b>Modify</b> next to <b>Schedule Migration</b>.</li> <li>Set <b>Start Time</b> and <b>End Time</b>, and click <b>Confirm</b>.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Modify the number of concurrent subtasks.                               | <ol style="list-style-type: none"> <li>In the <b>Progress</b> area, click <b>Modify</b> under <b>Expected Concurrent Subtasks</b> to change the expected number of concurrent subtasks. There cannot be more than 10 concurrent subtasks for each online migration node. For example, if there are 2 online migration nodes, the maximum number of subtasks can be 20 or any number below.</li> <li>Click <b>Confirm</b>.</li> </ol>                                                                                                                                                                                                                                                                                                    |
| Add traffic limiting rules.                                             | <ol style="list-style-type: none"> <li>In the <b>Migration Speed</b> area, click <b>Add</b> to add a rule to limit the bandwidth the migration can use in a specified period.<br/><b>NOTICE</b> <ul style="list-style-type: none"> <li>The bandwidth limit ranges from 1 MB to 1,024 GB.</li> <li>Time periods in different rules cannot overlap. For example, if there is a rule added for the period from 8:00 to 12:00, you cannot configure rules for any overlapped periods, such as from 7:00 to 13:00, 7:00 to 8:00, and 9:00 to 12:00.</li> <li>The start time of a rule cannot be later than the end time. For example, the time period from 23:00 to 01:00 is not allowed.</li> </ul> </li> <li>Click <b>Save</b>.</li> </ol> |
| Obtain the list of files that fail to be migrated, skipped or migrated. | In the <b>File Statistics</b> area, view the path of the list of files that failed to be migrated, skipped, or migrated. Click a file path, and it will take you to the OBS bucket where the list is stored. You can download the list from the bucket.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| View traffic statistics.                                                | In the <b>Traffic Statistics</b> area, view the migration traffic in the last 1 hour, last 6 hours, last 24 hours, or the entire migration period.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

----End

## Source Data Filters

The following table describes the rules and restrictions for setting source data filters.

**Table 1-57** Filter options

| Option           | Description                                                                                                                                                                                                                                                                                    | Patten Rule                                                                                                                                                         | Constraint                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Exclude Patterns | If a file matches any excluded pattern, the file will not be migrated or compared for consistency. Both exact match and fuzzy match are supported.                                                                                                                                             | <ul style="list-style-type: none"> <li>Exact match<br/>You need to specify absolute paths and use slashes (\) to escape special characters in the paths.</li> </ul> | <ul style="list-style-type: none"> <li>Except for {}, consecutive characters specified in pattern rules are not allowed, for example, <code>***</code>, <code>*?</code>, <code>**?</code>, <code>?*</code>, <code>?**</code>, <code>*{*,}*</code>, <code>*}*?</code>, <code>?{*</code>, <code>{*}</code>, <code>{,}</code>, <code>{*,,*}</code>, <code>*</code>, and <code>,</code></li> </ul> |
| Include Patterns | <ul style="list-style-type: none"> <li>If no included patterns are specified, all files in the source will be migrated.</li> <li>If included patterns are specified, only the files whose absolute paths match the specified patterns will be migrated or compared for consistency.</li> </ul> |                                                                                                                                                                     | <ul style="list-style-type: none"> <li>Only asterisks (*) can be used as wildcard characters in {}.</li> <li>Nesting {} inside another set of {} is not allowed.</li> <li>Excluded patterns take precedence over included patterns.</li> <li>Semicolons (;) are used to separate patterns outside {}.</li> </ul>                                                                               |

| Option | Description | Pattern Rule                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Constraint |
|--------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
|        |             | <p><b>CAUTION</b><br/>Precautions for configuring exclude and include patterns:</p> <ul style="list-style-type: none"> <li>If the file system address ends with <code>:/</code>, when you configure the paths to be excluded or included, enter their absolute paths relative to the mount point. For example, if the file system address is <b>192.1.1.1:/</b> and the mount point is <b>/mnt/turbo</b>, enter absolute paths relative to <b>/mnt/turbo</b>.</li> </ul> <p>For example:<br/> <pre>[root@oms-cluster-ecs-filter_test]# pwd /mnt/sts_turbo/mgc/filter_test [root@oms-cluster-ecs-filter_test]# ll drwxr-xr-x 2 root root 0 Aug 16 15:27 test2 -rw-r--r-- 1 root root 5 Aug 16 15:27 test2.log</pre>                     To exclude the <b>test2.log</b> file from the migration, you can enter its absolute path <b>/mgc/filter_test/test2.log</b> in the <b>Exclude</b> </p> |            |

| Option | Description | Patten Rule                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Constraint |
|--------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
|        |             | <ul style="list-style-type: none"> <li>• Fuzzy match                             <ul style="list-style-type: none"> <li>- An asterisk (*) matches zero or more characters except for slashes (/).</li> <li>- A pair of asterisks (**) matches zero or more characters including slashes (/).</li> <li>- A question mark (?) matches exactly one character, but not slashes (/).</li> <li>- Commas (,) are used to separate patterns in {}. Patterns in {} are in an OR relationship.</li> <li>- Wildcard characters asterisk (*) and question mark (?) are escaped by backslashes (\). In other cases, a backslash (\) means itself.</li> </ul> </li> </ul> |            |

| Option     | Description                                                                                                                                                                                                                                                                                                                                                                | Patten Rule | Constraint |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|
| Time Range | Filters files and directories to be migrated based on when they were last modified. Only files and directories whose last modification times fall in the configured time range will be migrated.<br><br>The start time and end time can be left empty. If they are left empty, the system will not filter out source files by time. The time can be precise to the minute. |             |            |

The following table lists example pattern rules for different scenarios.

**NOTICE**

Assume that you want to migrate the directory **test** in the source storage system.

- If the source storage system is a NAS device, enter **/test** as an "include" pattern.
- If the source storage system is an object storage system, enter **test** as an "include" pattern.

| Scenario                                                     | Example Pattern for NAS                                                                                                                                         | Example Pattern for Object Storage                                                                                                                             | Description                                                                     |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| File paths that end with <i>xx</i>                           | <i>/xx /**xx</i>                                                                                                                                                | <i>xx/**xx</i>                                                                                                                                                 | <i>xx</i> can be an expression containing asterisks (*) and question marks (?). |
| Files whose names start with <i>xx</i> in the root directory | <i>/xx*</i><br><ul style="list-style-type: none"> <li>• <b>/testssss</b> matches the pattern.</li> <li>• <b>/test/xx</b> does not match the pattern.</li> </ul> | <i>/xx*</i><br><ul style="list-style-type: none"> <li>• <b>testssss</b> matches the pattern.</li> <li>• <b>/test/xx</b> does not match the pattern.</li> </ul> |                                                                                 |
| File paths that start with <i>xx</i>                         | <i>/xx**</i><br><i>/xx/**</i>                                                                                                                                   | <i>xx**</i><br><i>xx/**</i>                                                                                                                                    |                                                                                 |
| Files whose names contain <i>xx</i>                          | <i>**xx*</i>                                                                                                                                                    | <i>**xx*</i>                                                                                                                                                   |                                                                                 |
| File paths that contain <i>xx</i>                            | <i>**xx**</i>                                                                                                                                                   | <i>**xx**</i>                                                                                                                                                  |                                                                                 |

| Scenario                                                      | Example Pattern for NAS  | Example Pattern for Object Storage | Description                                                                                 |
|---------------------------------------------------------------|--------------------------|------------------------------------|---------------------------------------------------------------------------------------------|
| File paths that start with <i>xx</i> and end with <i>yy</i> . | <code>/xx**yy</code>     | <code>xx**yy</code>                | <i>xx</i> and <i>yy</i> can be expressions containing asterisks (*) and question marks (?). |
| File paths that end with <i>xx</i> or <i>yy</i>               | <code>**{xx,yy}</code>   | <code>**{xx,yy}</code>             |                                                                                             |
| Files whose names contain <i>xx</i> or <i>yy</i>              | <code>**{xx,yy}*</code>  | <code>**{xx,yy}*</code>            |                                                                                             |
| Files paths that contain <i>xx</i> or <i>yy</i>               | <code>**{xx,yy}**</code> | <code>**{xx,yy}**</code>           |                                                                                             |

## 1.10.5 Creating a Batch Object Storage Migration Workflow

This section describes how to create a workflow to efficiently migrate buckets in batches.

### Notes and Constraints

- For more information, see [What Are the Restrictions on Using MgC for Storage Migration?](#)
- Data in the Deep Cold Archive storage of Alibaba Cloud OSS cannot be restored using the restoration function of MgC. You need to manually restore the data before migration.

### Warnings

When you create a workflow, there are three options for **Overwrite Existing: Never, Always, and If older or different size**. If you choose **Never**, restarting the migration task after interruptions or pauses may cause incomplete data migration, but the task may still be displayed as successful, which affects data integrity. Use the **Never** option with caution.

### Prerequisites

You have [created a batch object storage migration plan](#).

### Procedure

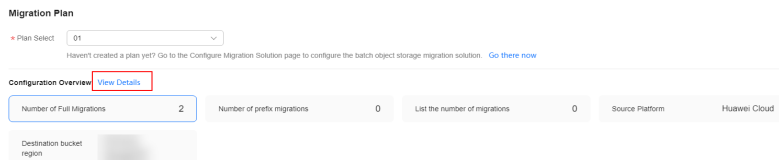
- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select an [application migration project](#) from the drop-down list.
- Step 2** In the navigation pane, choose **Migrate > Workflows**.
- Step 3** Click **Create Workflow** in the upper right corner of the page.
- Step 4** In the **Batch Object Storage Migration** card, click **Preview Steps** to view the stages and steps predefined in the template and the detailed description of each



stage and step. Steps of the **Automated** type will be automatically performed by MgC. Click **Configure Workflow** in the lower right corner.

**Step 5** In the **Basic Information** area, enter a name and description for the workflow.

**Step 6** In the **Migration Plan** area, select the created **migration plan**. Then you should view the overview of the migration plan. Click **View Details** to view more information about the plan.



**Step 7** In the **Migration Cluster** area, select the cluster used for the migration. The cluster selected in the migration plan is used by default, but you can select another one if needed. The modification is applied to the current workflow but not to the migration plan.

**Step 8** Configure the migration task based on **Table 1-58**.

**Table 1-58** Parameters for configuring a migration task

| Parameter           | Value  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Concurrent Subtasks | -      | Set the maximum number of concurrent subtasks. There cannot be more than 10 concurrent subtasks for each online migration node. For example, if there are 2 online migration nodes, the maximum number of subtasks can be 20 or any number below.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Overwrite Existing  | Never  | Files existing at the migration target are never overwritten.<br><b>WARNING</b> <ul style="list-style-type: none"> <li>If you choose <b>Never</b> for the initial migration, the attributes of involved parent folders at the source will not be migrated to the target. As a result, the folder attributes may be incomplete at the target. To avoid this issue, use the <b>Never</b> option with caution for the initial migration.</li> <li>If a migration task is paused or interrupted and then restarted or resumed, the <b>Never</b> option will cause the system to skip files that were not completely migrated earlier, but the task may still be marked as successful. This affects data integrity. To avoid this issue, use the <b>Never</b> option with caution.</li> </ul> |
|                     | Always | Files existing at the migration target are always overwritten.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Parameter         | Value                       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | If older or different size  | <ul style="list-style-type: none"> <li>Files that already exist at the target will be overwritten if they are older than or have different sizes from the paired files at the source.</li> <li>Verification will be performed for folders after their contents are migrated. Folders that already exist at the target will be overwritten if they have different last modification times, sizes, or permissions from the paired folders at the source.</li> </ul> <p><b>NOTE</b><br/>The same overwriting policy is applied to empty folders as files.</p>                                                                                     |
|                   | If different CRC64 checksum | <ul style="list-style-type: none"> <li>If a source object has a CRC64 checksum different from the paired target object, the source object will overwrite the target one. Otherwise, the source object will be skipped during the migration. If either of them does not have a CRC64 checksum, their sizes and last modification times are checked.</li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>This option is only available for migration on Huawei Cloud or from Alibaba Cloud or Tencent Cloud.</li> <li>Using this option requires that the target OBS bucket be added to the CRC64 feature whitelist.</li> </ul> |
| Consistency Check | Size and last modified      | With this default method, the system checks data consistency by comparing object size and last modification time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                   | CRC64 checksum              | <p>The system verifies data consistency by comparing CRC64 values in the metadata. If a source object and the paired destination object have CRC64 checksums, the checksums are checked. Otherwise, their sizes and last modification times are checked.</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>This option is only available for migration on Huawei Cloud or from Alibaba Cloud or Tencent Cloud.</li> <li>Using this option requires that the target OBS bucket be added to the CRC64 feature whitelist.</li> </ul>                                                                                                  |
| Migrate Metadata  | -                           | <p>Decide whether to migrate metadata.</p> <ul style="list-style-type: none"> <li>If you select this option, object metadata will be migrated.</li> <li>If you do not select this option, only the Content-Type and Content-Encoding metadata will be migrated.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                     |

**Step 9** (Optional) Configure advanced options based on [Table 1-59](#).

**Table 1-59** Advanced options

| Parameter                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Record Migration Results | <p>Determine the migration results you want to record. After the migration is complete, records are automatically generated and saved to the <b>/oms</b> directory in the target storage systems. Multiple options can be selected.</p> <p>For example, if you select <b>Migrated objects</b>, all migrated objects will be recorded in a file, and the file will be saved to the <b>/oms</b> directory in the target storage systems.</p>                                                                                                                                                                                                                                                                                                             |
| Migrate Incremental Data | <p>If you select <b>No</b>, incremental migration will not be performed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                          | <p>If you select <b>Yes</b>, configure the overwriting policy and the execution mode for incremental migration. For details, see <a href="#">Configuring Incremental Migration Settings</a>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Target Storage Class     | <p>Choose the storage class that your data will be migrated to in the target bucket. For details about storage classes, see <a href="#">Introduction to Storage Classes</a>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Enable KMS Encryption    | <ul style="list-style-type: none"> <li>If you do not select this option, whether migrated data will be encrypted in the target bucket depends on the server-side encryption setting of the bucket.</li> <li>If you select this option, all migrated objects will be encrypted before they are stored in the target bucket.</li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>Using KMS to encrypt migrated data may slow down the migration speed by about 10%.</li> <li>This option is only available when KMS is supported in the region you are migrating to.</li> </ul>                                                                                                                                                         |
| Restore Archive Data     | <ul style="list-style-type: none"> <li>If you do not select this option, the system records archive objects in the list of objects that failed to be migrated and continues to migrate other objects in the migration task.</li> <li>If you select this option, the system automatically restores and migrates archive objects in the migration task. If an archive object fails to be restored, the system skips it and records it in the list of objects that failed to be migrated and continues to migrate other objects in the migration task.</li> </ul> <p><b>NOTE</b></p> <p>The system will restore archive data before migrating it, and you pay the source cloud platform for the API requests and storage space generated accordingly.</p> |
| Filter Source Data       | <p>Filter files to be migrated by applying filters. For details about the filters, see <a href="#">Source Data Filters</a>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Parameter              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Download Data from CDN | <p>If the default domain name cannot meet your migration requirements, then as long as the source cloud service provider supports custom domain names, you can bind a custom domain name to the source bucket, and enable the CDN service on the source platform to reduce data download expenses. Enter a custom domain name in the <b>Domain Name</b> text box and select a transmission protocol. HTTPS is more secure than HTTP and is recommended.</p> <p>If the migration source is the Alibaba Cloud OSS or Tencent Cloud COS, you also need to select an authentication type and enter an authentication key.</p>                                                                                                                                                                                                                                                                                                      |
| Send SMN Notification  | <p>Determine whether to use SMN to get notifications about migration results.</p> <ul style="list-style-type: none"><li>• If you do not select this option, no SMN messages are sent after the migration.</li><li>• If you select this option, after the migration, SMN messages are sent to the subscribers of the selected topic. You can select the language and trigger conditions for sending messages.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Limit Traffic          | <p>Allocate the maximum bandwidth to be used by the workflow during a specified period.</p> <ul style="list-style-type: none"><li>• If you do not select this option, migration traffic is not limited.</li><li>• If you select this option, limit the migration traffic by setting <b>Start Time</b>, <b>End Time</b>, and <b>Bandwidth Limit</b>. For example, if you set <b>Start Time</b> to <b>08:00</b>, <b>End Time</b> to <b>12:00</b>, and <b>Bandwidth Limit</b> to <b>20 MB/s</b>, the maximum migration speed is limited to 20 MB/s when the migration task runs from 08:00 to 12:00. The migration speed is not limited beyond this period.</li></ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"><li>- The rate limit ranges from 0 MB/s to 1,048,576 MB/s.</li><li>- A maximum of five rules can be added.</li><li>- The time is the local standard time of the region you are migrating to.</li></ul> |

**Step 10** Click **Next: Confirm**.

**Step 11** Confirm the workflow settings and click **Confirm**. The **Run Workflow** dialog box is displayed, which indicates that the workflow has been created.

- If you want to start the migration immediately, click **Confirm** to run the workflow.
- If you want to **add a stage or step** to the workflow, click **Cancel**. The workflow enters a **Waiting** state, and the migration is not started. To start the migration, click **Run** in the **Operation** column.

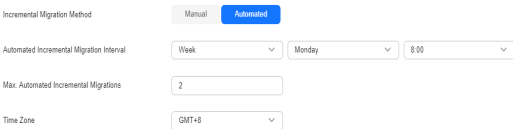
- Step 12** On the migration workflow details page, view the workflow settings and the migration progress. You can also perform the following operations:
- Move the cursor to the migration progress bar of a resource. In the displayed window, view the migration details about the resource.
  - When a migration reaches a step that requires manual confirmation, place the cursor on the progress bar and click **Confirm** next to the step status in the displayed window. The migration can continue only after you confirm.
  - In the **Basic Information** area, click **Manage** next to the cluster name. The cluster details page is displayed on the right. On the displayed page, you can:
    - Add, edit, or delete traffic limiting rules to control cluster traffic based on your requirements.
    - Add or delete migration nodes or list nodes, or upgrade plug-ins for existing nodes as required.
  - In the **Basic Information** area, expand **Advanced Settings**. Review the incremental migration settings. If **Incremental Migration Method** is set to **Automated**, you can modify the number of incremental migrations.

----End

## Configuring Incremental Migration Settings

The following table describes the parameters about incremental migration.

**Table 1-60** Configuring incremental migration settings

| Parameter                                       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overwrite Existing During Incremental Migration | For details, see <a href="#">Table 1-58</a> .<br><b>NOTE</b><br>This setting only applies to incremental migration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Incremental Migration Method                    | <ul style="list-style-type: none"> <li>• <b>Manual:</b> You can manually initiate an incremental migration after the first incremental migration defined in the workflow is complete.</li> <li>• <b>Automated:</b> You can define the interval, maximum attempts, and time zone to trigger incremental migrations.<br/>For example, if you configure the incremental migration settings as shown in the following figure, the system will initiate incremental migration at 8:00 a.m. on Mondays, GMT+8, for the next two weeks.</li> </ul>  |

- If you select **Manual**, incremental migration will be executed immediately when the workflow reaches the **BatchCreateIncrementalMigrationTasks** step.
- If you select **Automated**, when the workflow reaches the **BatchCreateIncrementalMigrationTasks** step, you can:
  - Manually perform incremental migration immediately when you are waiting for automatic incremental migration.
  - Skip incremental migration and verify services.

## 1.10.6 Creating a Batch File Storage Migration Workflow

This section describes how to create a workflow to efficiently migrate file systems in batches.

### Notes and Constraints

For more information, see [What Are the Restrictions on Using MgC for Storage Migration?](#)

### Warnings

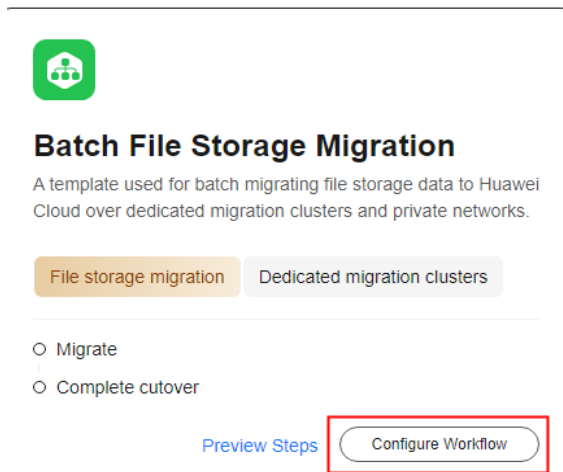
When you create a workflow, there are three options for **Overwrite Existing: Never, Always, and If older or different size**. If you choose **Never**, restarting the migration task after interruptions or pauses may cause incomplete data migration, but the task may still be displayed as successful, which affects data integrity. Use the **Never** option with caution.

### Prerequisites

You have [created a batch file storage migration plan](#).

### Procedure

- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select an [application migration project](#) from the drop-down list.
- Step 2** In the navigation pane, choose **Migrate > Workflows**.
- Step 3** Click **Create Workflow** in the upper right corner of the page.
- Step 4** In the **Batch File Storage Migration** card, click **Preview Steps** to view the stages and steps predefined in the template and the detailed description of each stage and step. Steps of the **Automated** type will be automatically performed by MgC. Click **Configure Workflow** in the lower right corner.



**Step 5** In the **Basic Information** area, enter a name and description for the workflow.

**Step 6** In the **Migration Plan** area, select the created **migration plan**. Then you should view the overview of the migration plan. Click **View Details** to view more information about the plan.



**Step 7** In the **Migration Cluster** area, select the cluster used for the migration. The cluster specified in the migration plan is preselected by default, but you can select another one if needed. The modification is applied to the current workflow but not to the migration plan.

**Step 8** Configure the migration settings based on **Table 1-61**.

**Table 1-61** Parameters for configuring migration settings

| Parameter           | Option | Description                                                                                                                                                                                                      |
|---------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Concurrent Subtasks | -      | User-defined. There cannot be more than 10 concurrent subtasks for each online migration node. For example, if there are 2 online migration nodes, the maximum number of subtasks can be 20 or any number below. |

| Parameter          | Option                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overwrite Existing | Never                      | Files existing at the target will never be overwritten.<br><b>WARNING</b> <ul style="list-style-type: none"> <li>If you choose <b>Never</b> for the initial migration, the attributes of involved parent folders at the source will not be migrated to the target. As a result, the folder attributes may be incomplete at the target. To avoid this issue, use the <b>Never</b> option with caution for the initial migration.</li> <li>If a migration task is paused or interrupted and then restarted or resumed, the <b>Never</b> option will cause the system to skip files that were not completely migrated earlier, but the task may still be marked as successful. This affects data integrity. To avoid this issue, use the <b>Never</b> option with caution.</li> </ul> |
|                    | Always                     | Files existing at the migration target will always be overwritten.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                    | If older or different size | <ul style="list-style-type: none"> <li>Files that already exist at the target will be overwritten if they are older than or have different sizes from the paired files at the source.</li> <li>Verification will be performed for folders after their contents are migrated. Folders that already exist at the target will be overwritten if they have different last modification times, sizes, or permissions from the paired folders at the source.</li> </ul> <b>NOTE</b><br>The same overwriting policy is applied to empty folders as files.                                                                                                                                                                                                                                 |
| Migrate Metadata   | -                          | Decide whether to migrate metadata. <ul style="list-style-type: none"> <li>If you select this option, object metadata will be migrated.</li> <li>If you do not select this option, only the Content-Type and Content-Encoding metadata will be migrated.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

**Step 9** (Optional) Configure advanced options based on [Table 1-62](#).

**Table 1-62** Advanced options

| Parameter                       | Description                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sync Incremental Before Cutover | <ul style="list-style-type: none"> <li>If you select <b>Yes</b>, an incremental migration step will be automatically added after the migration verification step in the migration phase.</li> <li>If you select <b>No</b>, the service cutover phase starts after the migration verification step in the migration phase is complete.</li> </ul> |



| Parameter             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Filter Source Data    | Filter files and directories to be migrated by applying filters. For details about the filters, see <a href="#">Source Data Filters</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Send SMN Notification | Determine whether to use SMN to get notifications about migration results. <ul style="list-style-type: none"><li>• If you do not select this option, no SMN messages will be sent after the migration is complete.</li><li>• If you select this option, after the migration is complete, SMN messages will be sent to the subscribers of the selected topic. You can select the language and trigger conditions for sending messages.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Limit Traffic         | Allocate the maximum bandwidth to be used by the workflow during a specified period. <ul style="list-style-type: none"><li>• If you do not select this option, migration traffic is not limited.</li><li>• If you select this option, limit the migration traffic by setting <b>Start Time</b>, <b>End Time</b>, and <b>Bandwidth Limit</b>. For example, if you set <b>Start Time</b> to <b>08:00</b>, <b>End Time</b> to <b>12:00</b>, and <b>Bandwidth Limit</b> to <b>20 MB/s</b>, the maximum migration speed is limited to 20 MB/s when the migration runs from 08:00 to 12:00. The migration speed is not limited beyond this period.</li></ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"><li>- The bandwidth limit ranges from 0 MB/s to 1,048,576 MB/s.</li><li>- A maximum of five rules can be added.</li><li>- The time is the local standard time of the region you are migrating to.</li></ul> |

**Step 10** Click **Next: Confirm**.

**Step 11** Confirm the workflow settings and click **Confirm**. The **Run Workflow** dialog box is displayed, which indicates that the workflow has been created.

- If you want to start the migration immediately, click **Confirm** to run the workflow.
- If you want to [add a stage or step](#) to the workflow, click **Cancel**. The workflow enters a **Waiting** state, and the migration is not started. To start the migration, click **Run** in the **Operation** column.

**Step 12** In the workflow list, click the workflow name to go to its details page. You can view the configuration information and migration progress of the workflow. You can also perform the following operations:

- Move the cursor to the migration progress bar of a resource. In the displayed window, view the migration details about the resource.
- When a migration reaches a step that requires manual confirmation, place the cursor on the progress bar and click **Confirm** next to the step status in the displayed window. The migration can continue only after you confirm.

- In the **Basic Information** area, click **Manage** next to the migration cluster name. The cluster details page is displayed on the right. On the displayed page, you can:
  - Add, edit, or delete traffic limiting rules to control cluster traffic based on your requirements.
  - Add or delete migration nodes or list nodes, or upgrade plug-ins for existing nodes as required.

----End

## 1.10.7 Adding a Stage or Step

You can customize a migration workflow to fit your requirements better by adding stages or steps to the workflow.

---

### CAUTION

- You can only add a stage before or after an existing stage when the existing stage is in **Waiting** or **Paused** state. This is true for step additions.
  - If the previous stage is in **Running**, **Paused**, or **Complete** state, you can only add a stage after the existing stage. This is also true for step additions.
  - You cannot add steps after repeatable steps.
- 

### Adding a Stage

- Step 1** On the migration workflow details page, move the cursor to the migration stage before or after which you want to add a stage. In the displayed window, choose **Add Stage Before** or **Add Stage After**.
- Step 2** Enter a stage name and description, click **Add Step**, select a step type, enter a step name and description, and click **Confirm**. Multiple steps can be added.
- Step 3** Click **Confirm**.

---

### NOTICE

Manually added stages can be modified or deleted, but pre-defined stages cannot.

---

----End

### Adding a Step

- Step 1** On the migration workflow details page, move the cursor to the step before or after which you want to add a step. In the displayed window, choose **Add Step Before** or **Add Step After**.
- Step 2** Select a step type based on [Table 1-63](#), enter a step name and description, and click **Confirm**.

**Table 1-63** Step types

| Type       | Description                                                                          |
|------------|--------------------------------------------------------------------------------------|
| Checkpoint | You need to manually confirm this type of steps, so that the workflows can continue. |

**Step 3** Go back to the migration stage and view the added step.

**NOTICE**

Manually added steps can be modified or deleted, but pre-defined steps cannot.

----End

## 1.11 Big Data Migration (from MaxCompute to DLI)

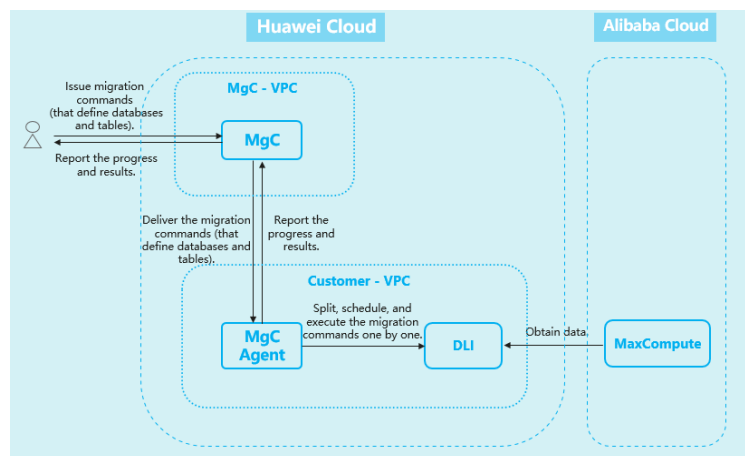
### 1.11.1 Overview

#### Migration Scenario

This section describes how to migrate big data from Alibaba Cloud MaxCompute to Huawei Cloud DLI.

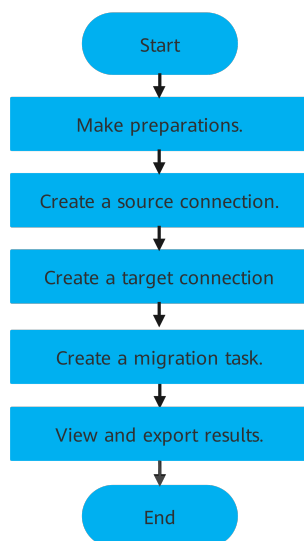
#### Migration Diagram

**Figure 1-51** Big data migration diagram



## Migration Process

Figure 1-52 Big data migration process



### 1.11.2 Before You Start

#### Constraints

- MgC cannot migrate data of the DATETIME type from MaxCompute. Before the migration, you need to convert such data to the STRING format.
- MgC cannot migrate data of the VARCHAR or CHAR type from MaxCompute. Before the migration, you need to convert such data to the STRING format.
- MgC cannot migrate metadata of transaction tables (those with the **transactional=true** field in DDL statements).
- The TIMESTAMP\_NTZ type of data in MaxCompute is not supported by the Alibaba Cloud SDK. As a result, the metadata of involved tables will fail to be migrated.
- When partition data is migrated repeatedly, if the error message "Do not support update partition SerDeInfo for DLI table" is displayed, you need to manually delete the partition data from DLI and then migrate the data again.
- MgC allows you to narrow the migration scope to specific partitions in MaxCompute. You must enter the names of involved tables in the Excel template in lowercase letters. MaxCompute converts table names to lowercase during table creation. If the table names in the Excel template are in uppercase, the migration will fail as the tables cannot be recognized.

#### Notes

- Editing a CSV template file  
When you use the CSV template provided by MgC to filter data, do not use Excel to edit the CSV file. The file edited and saved in Excel cannot be identified by MgC.
- Selecting a DLI connection

Migrating metadata and data requires different DLI connections. Migrating metadata requires a DLI connection with a SQL queue configured, while migrating data requires a DLI connection with a general-purpose queue configured. If an incorrect connection is configured for a migration task, the migration task will fail.

- Considering the constraint on the number of databases

During a metadata migration, MgC automatically creates a corresponding number of databases as listed in the metadata. Since the system has a quota of 10 DLI databases per account, exceeding this quota could cause the migration to fail.

## 1.11.3 Preparations

To ensure a smooth migration, you need to make the following preparations.

### Preparing a Huawei Account

Before using MgC, prepare a HUAWEI ID or an IAM user that can access MgC and obtain an AK/SK pair for the account or IAM user. For details, see [Preparations](#).

#### NOTE

When you create a metadata connection, if you want to collect and view resource usage information, assign the read-only permission (ReadOnly) for MRS and DLI to the IAM user.

### Obtaining an AK/SK Pair for Your Alibaba Cloud Account

Obtain an AK/SK pair for your Alibaba Cloud account. For more information, see [Viewing the AccessKey Pairs of a RAM User](#).

Ensure that the AK/SK pair has the following permissions:

- **AliyunReadOnlyAccess**: read-only permission for OSS
- **AliyunMaxComputeReadOnlyAccess**: read-only permission for MaxCompute

For details about how to obtain these permissions, see [Granting Permissions to RAM Users](#).

(Optional) If there are partitioned tables to be migrated, the **Information Schema** permission is required for the source account. To learn how to obtain the permission, see [Authorization for RAM Users](#).

### Creating a Big Data Migration Project

On the MgC console, create a migration project. For details, see [Managing Migration Projects](#).

### Configuring an Agency

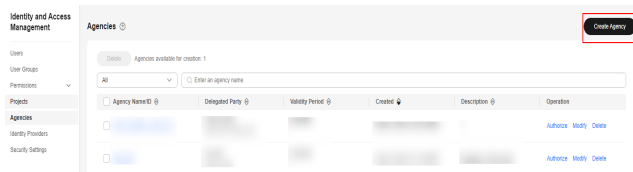
To ensure that DLI functions can be used properly, you need to configure an agency with DLI and OBS permissions.

**Step 1** Sign in to the Huawei Cloud console.

**Step 2** Hover the mouse over the username in the upper right corner and choose **Identity and Access Management** from the drop-down list.

**Step 3** In the navigation pane, choose **Agencies**.

**Step 4** Click **Create Agency**.



**Step 5** On the **Create Agency** page, set the following parameters:

- **Agency Name:** Set a name, for example, **dli\_obs\_agency\_access**.
- **Agency Type:** Select **Cloud service**.
- **Cloud Service:** Select **Data Lake Insight (DLI)** from the drop-down list.
- **Validity Period:** Set a period as needed.
- **Description:** This parameter is optional.

**Step 6** Click **Next**. The **Select Policy/Role** tab is displayed.

**Step 7** Click **Create Policy** in the upper right corner. Create two policies (one for OBS and one for DLI) by referring to [step 8](#) and [step 9](#). If there are existing policies containing the required permissions, you can use them.

**Step 8** Configure policy information.

1. **Policy Name:** Set a name, for example, **dli-obs-agency**.
2. **Policy View:** Select **JSON**.
3. Copy and paste the following content to the **Policy Content** box.

---

**CAUTION**

Replace *<bucket-name>* with the name of the bucket where the JAR packages are stored.

---

```
{
 "Version": "1.1",
 "Statement": [
 {
 "Effect": "Allow",
 "Action": [
 "obs:bucket:GetBucketPolicy",
 "obs:bucket:GetLifecycleConfiguration",
 "obs:bucket:GetBucketLocation",
 "obs:bucket:ListBucketMultipartUploads",
 "obs:bucket:GetBucketLogging",
 "obs:object:GetObjectVersion",
 "obs:bucket:GetBucketStorage",
 "obs:bucket:GetBucketVersioning",
 "obs:object:GetObject",
 "obs:object:GetObjectVersionAcl",
 "obs:object:DeleteObject",
 "obs:object:ListMultipartUploadParts",
 "obs:bucket:HeadBucket",
 "obs:bucket:GetBucketAcl",
 "obs:bucket:GetBucketStoragePolicy",
 "obs:object:AbortMultipartUpload",
 "obs:object:DeleteObjectVersion",
 "obs:object:GetObjectAcl",
 "obs:bucket:ListBucketVersions",
 "obs:bucket:ListBucket",
 "obs:object:PutObject"
],
 "Resource": [
 "OBS:*:*:bucket:<bucket-name>", //Replace <bucket-name> with the name of the bucket
 "OBS:*:*:object:*"
]
 },
 {
 "Effect": "Allow",
 "Action": [
 "obs:bucket:ListAllMyBuckets"
]
 }
]
}
```

### Step 9 Configure policy information.

1. **Policy Name:** Set a name, for example, **dli-agency**.
2. **Policy View:** Select **JSON**.
3. Copy and paste the following content to the **Policy Content** box.

```
{
 "Version": "1.1",
 "Statement": [
 {
 "Effect": "Allow",
 "Action": [
 "dli:table:showPartitions",
 "dli:table:alterTableAddPartition",
 "dli:table:alterTableAddColumns",
 "dli:table:alterTableRenamePartition",
 "dli:table:delete",
 "dli:column:select",
 "dli:database:dropFunction",
 "dli:table:insertOverwriteTable",
 "dli:table:describeTable",
 "dli:database:explain",
 "dli:table:insertIntoTable",
 "dli:database:createDatabase",
 "dli:table:alterView",
 "dli:table:showCreateTable",

```

```
"dli:table:alterTableRename",
"dli:table:compaction",
"dli:database:displayAllDatabases",
"dli:database:dropDatabase",
"dli:table:truncateTable",
"dli:table:select",
"dli:table:alterTableDropColumns",
"dli:table:alterTableSetProperties",
"dli:database:displayAllTables",
"dli:database:createFunction",
"dli:table:alterTableChangeColumn",
"dli:database:describeFunction",
"dli:table:showSegments",
"dli:database:createView",
"dli:database:createTable",
"dli:table:showTableProperties",
"dli:database:showFunctions",
"dli:database:displayDatabase",
"dli:table:alterTableRecoverPartition",
"dli:table:dropTable",
"dli:table:update",
"dli:table:alterTableDropPartition"
]
}
]
```

**Step 10** Click **Next**.

**Step 11** Select the created custom policies with OBS and DLI permissions and click **Next**. Set **Scope** to **All resources**.

**Step 12** Click **OK**. It takes 15 to 30 minutes for the authorization to be in effect.

**Step 13** Update the agency permissions by referring to [Updating DLI Agency Permissions](#).

----End

## Creating a VPC

Before purchasing an ECS, you need to create a VPC and subnet to deploy it. For details, see [Creating a VPC and Subnet](#).

---

### CAUTION

You need to deploy an ECS in this VPC and buy a DLI elastic resource pool in a different VPC. A DLI resource pool defaults to run in the CIDR block 172.16.0.0/18.

---

## Purchasing an ECS

- Purchase a Linux ECS. The ECS and the DLI resources you prepare later must be in the same region. For details, see [Purchasing an ECS](#). Select the [created VPC and subnet](#) for the ECS. The ECS must:
  - Be able to access the Internet and the domain names of MgC, IoTDA, and other cloud services. For details about the domain names to be accessed, see [Domain Names](#).
  - Allow outbound traffic on 8883 if it is in a security group.
  - Run CentOS 8.X.



- Have at least 8 vCPUs and 16 GB of memory.
- Configure an EIP for the ECS, so that the ECS can access the Internet. For details, see [Assigning an EIP](#) and [Binding an EIP to an ECS](#).
- **Billing Mode:** Select **Pay-per-use**.
- **Bandwidth:** **5 Mbit/s** is recommended.

## Installing the MgC Agent (formerly Edge) and Connecting It to MgC

- On the purchased ECS, install the MgC Agent, which will be used for data verification. For details, see [Installing the MgC Agent for Linux](#).
- Register an MgC Agent account. In the address box of a browser, enter the NIC IP address of the Linux ECS and port 27080, for example, `https://x.x.x.x:27080`. After the first login, the registration page is displayed. Enter a username and password, confirm the password, and click **Privacy Statement**. Read the statement carefully, select **I have read and agree to the Privacy Statement**, and click **OK** to complete the registration.
- [Connect the MgC Agent to MgC](#).

---

 **CAUTION**

- When connecting the MgC Agent to MgC, save the entered AK/SK pair of your Huawei Cloud account as the target credentials, which will be used for migration later.
  - The MgC Agent does not support automatic restart. Do not restart the MgC Agent during task execution, or tasks will fail.
- 

## Adding Credentials

On the MgC Agent console, add the AK/SK pairs of your Alibaba Cloud account and Huawei Cloud account. For details, see [Adding Resource Credentials](#).

- When you add the credentials for access your MaxCompute resources, enter the AK/SK pair of your source Alibaba Cloud account.

**Add Credential**

|                         |                                         |
|-------------------------|-----------------------------------------|
| * Resource Type         | <input type="text" value="Bigdata"/>    |
| * Resource Subtype      | <input type="text" value="MaxCompute"/> |
| * Credential Name       | <input type="text"/>                    |
| * Authentication Method | <input type="text" value="AK/SK"/>      |
| * ak                    | <input type="text" value="ak"/>         |
| * sk                    | <input type="text" value="sk"/>         |

- When you add the credentials for accessing your DLI resources, enter the AK/SK pair of your Huawei Cloud account.

**Add Credential**

|                         |                                 |
|-------------------------|---------------------------------|
| * Resource Type         | Bigdata                         |
| * Resource Subtype      | Data Lake Insights (DLI)        |
| * Credential Name       | <input type="text"/>            |
| * Authentication Method | AK/SK                           |
| * ak                    | <input type="text" value="ak"/> |
| * sk                    | <input type="text" value="sk"/> |

## Creating an OBS Bucket and Uploading JAR Packages

Create a bucket on Huawei Cloud OBS and upload the Java files (in JAR packages) that data migration depends on to the bucket. For details about how to create an OBS bucket, see [Creating a Bucket](#). For details about how to upload files, see [Uploading an Object](#).

The JAR packages that data migration depends on are **migration-dli-spark-1.0.0.jar**, **fastjson-1.2.54.jar**, and **datasource.jar**. Below, you'll find a description of what each package is used for and how to obtain them.

- **migration-dli-spark-1.0.0.jar**
  - This package is used to create Spark sessions and submit SQL statements.
  - You can obtain the package from the `/opt/cloud/the MgC Agent/tools/plugins/collectors/bigdata-migration/dliSpark` directory on the [ECS where the MgC Agent is installed](#).
- **fastjson-1.2.54.jar**
  - This package provides fast JSON conversion.
  - You can obtain the package from the `/opt/cloud/the MgC Agent/tools/plugins/collectors/bigdata-migration/deltaSpark` directory on the [ECS where the MgC Agent is installed](#).
- **datasource.jar**
  - This package contains the configuration and connection logic of data sources and allows the MgC Agent to connect to different databases or data storage systems.
  - You need to obtain and compile files in **datasource.jar** as required..


## Purchasing an Elastic Resource Pool and Adding a Queue on DLI

An elastic resource pool provides compute resources (CPU and memory) required for running DLI jobs. For details about how to buy a resource pool, see [Buying an Elastic Resource Pool](#).

You can add a general-purpose queue and an SQL queue to the pool for running jobs. For more information, see [Creating Queues in an Elastic Resource Pool](#).

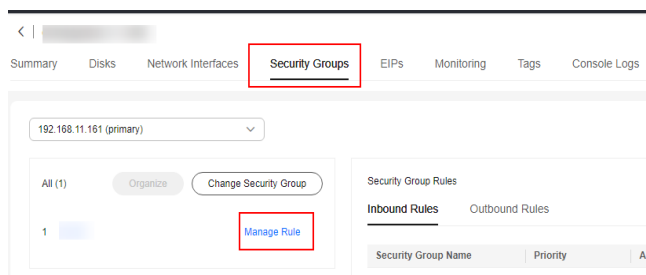
## Creating an Enhanced Datasource Connection on DLI

**Step 1** Sign in to the DLI console. In the navigation pane on the left, choose **Resources > Resource Pool**.

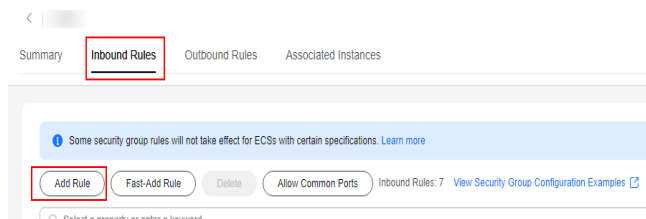
**Step 2** Click  next to the name of the elastic resource pool. In the expanded information, obtain the CIDR block of the elastic resource pool.

**Step 3** For the security group of the ECS with the MgC Agent installed, add an inbound rule to allow access from the CIDR block of the elastic resource pool.

1. Sign in to the ECS console.
2. In the ECS list, click the name of the Linux ECS with the MgC Agent installed.
3. Click the **Security Groups** tab and click **Manage Rule**.



4. Under **Inbound Rules**, click **Add Rule**.



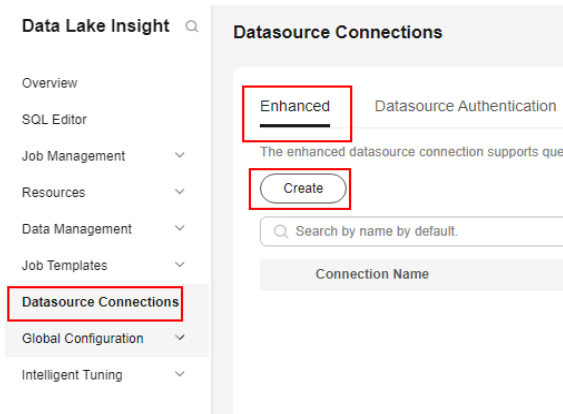
5. Configure parameters for the inbound rule.

- **Priority:** Set it to **1**.
- **Action:** Select **Allow**.
- **Type:** Select **IPv4**.
- **Protocol & Port:** Select **Protocols/All**.
- **Source:** Select **IP Address** and enter the CIDR block of the elastic resource pool.

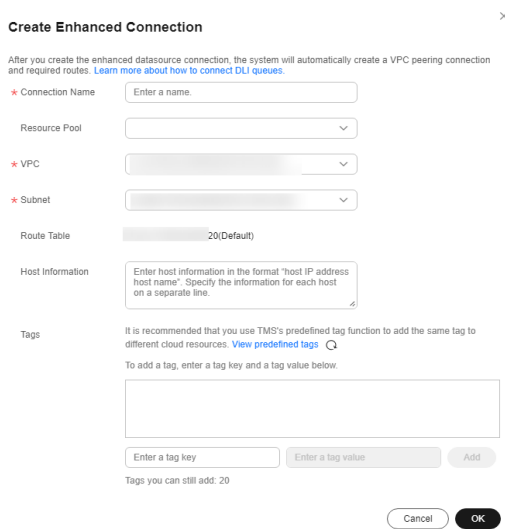
6. Click **OK**.

**Step 4** Switch to the DLI console. In the navigation pane on the left, click **Datasource Connections**.

**Step 5** Under **Enhanced**, click **Create**.



**Step 6** Configure enhanced datasource connection information based on [Table 1-64](#).



**Table 1-64** Parameters required for creating an enhanced connection

| Parameter       | Configuration                                       |
|-----------------|-----------------------------------------------------|
| Connection Name | Enter a name.                                       |
| Resource Pool   | Select the <b>purchased elastic resource pool</b> . |
| VPC             | Select the <b>created VPC and subnet</b> .          |
| Subnet          |                                                     |
| Route Table     | Retain the preset value.                            |

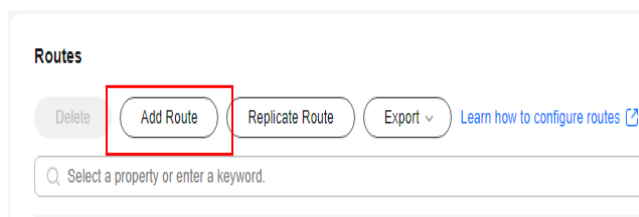
| Parameter        | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Host Information | <p>Add the information about the source MaxCompute hosts in the following format:</p> <p><b>EndpointIP Endpoint</b> (with a space in between)<br/> <b>TunnelEndpointIP TunnelEndpoint</b> (with a space in between)</p> <p>Separate two pieces of information by pressing <b>Enter</b>. For example:</p> <pre>118.178.xxx.xx service.cn-<br/>hangzhou.maxcompute.aliyun.com.vipgds.alibabadns.com<br/>47.97.xxx.xx dt.cn-hangzhou.maxcompute.aliyun.com</pre> <p>To obtain the values of <b>EndpointIP</b> and <b>TunnelEndpointIP</b>, use any server with a public IP address to ping the endpoint and tunnel endpoint of the region where the source MaxCompute cluster is located. The corresponding IP addresses will display in the command output.</p> <p>For details about MaxCompute endpoints and Tunnel endpoints, see <a href="#">Endpoints in different regions</a>.</p> |

**Step 7** Click **OK**. After the creation process is finished, the **Connection Status** of the newly created connection will be **Active**, indicating that the connection has been successfully created.

----End

## Adding and Configuring Routes

- Add routes.  
Add two routes for the [DLI enhanced datasource connection](#). For details, see [Adding a Route](#). In the routes, the IP address must be the same as the host IP addresses configured during datasource connection creation.
- Configure routes.
  1. Sign in to the VPC console.
  2. In the navigation pane on the left, choose **Virtual Private Cloud > Route Tables**.
  3. In the route table list, click the route table used for creating a datasource connection (that is, the route table of the VPC where the ECS resides).
  4. Click **Add Route**.



5. Set the parameters by following the instructions. You need to click



to add two routes.

- **Destination Type:** Select **IP address**.
- **Destination:** Enter the host IP address configured during datasource connection creation.
- **Next Hop Type:** Select **Server**.
- **Next Hop:** Select the **purchased ECS**.

## Configuring SNAT Rules

Configure SNAT rules for the ECS by following the instructions below. Restarting the ECS will clear the rules, so you will need to reconfigure them after a restart.

**Step 1** Log in to the **purchased ECS**.

**Step 2** Run the following commands in sequence:

```
sysctl net.ipv4.ip_forward=1
```

This command is used to enable IP forwarding in Linux.

```
iptables -t nat -A POSTROUTING -o eth0 -s {CIDR block where the DLI elastic resource pool resides} -j SNAT --to {Private IP address of the ECS}
```

This command is used to set an iptables rule for network address translation.

----End

## Testing the Connectivity Between the DLI Queue and the Data Source

**Step 1** Sign in to the DLI console. In the navigation pane on the left, choose **Resources > Queue Management**.

**Step 2** Locate the elastic resource pool that **the DLI queue was added** and choose **More > Test Address Connectivity** in the **Operation** column.

**Step 3** Enter the endpoint, endpoint IP address, Tunnel endpoint, and Tunnel endpoint IP address of MaxCompute to perform four connectivity tests. You are advised to use port 443.

**Step 4 Click Test.**

If the test address is reachable, you will receive a message.

If the test address is unreachable, you will also receive a message. Check the network configurations and try again. Network configurations include the VPC peering and the datasource connection. Check whether they have been activated.

----End

## **Adding to the DLI Spark 3.3 Whitelist and the JAR Program Whitelist for Metadata Access**

Contact the DLI technical support to whitelist you to use the DLI Spark 3.3 feature and allow Jar access to DLI metadata.

### **(Optional) Enabling DLI Spark Lifecycle Whitelist**

If the metadata to be migrated has a lifecycle (that is, the DDL contains the LIFECYCLE field), contact DLI technical support to enable the Spark lifecycle feature whitelist.

### **(Optional) Enabling the CIDR Block 100 Whitelist**

If you use Direct Connect to migrate data, you need to request VPC support to enable the whitelist of the 100.100.x.x segment.

Submit a service ticket to the VPC service and provide the following information:

- Huawei Cloud account and project ID of the region where your DLI resources reside. For details about how to obtain them, see [API Credentials](#).
- DLI tenant name and tenant project ID: Contact DLI technical support to obtain them.

## **1.11.4 Creating a Source Connection**

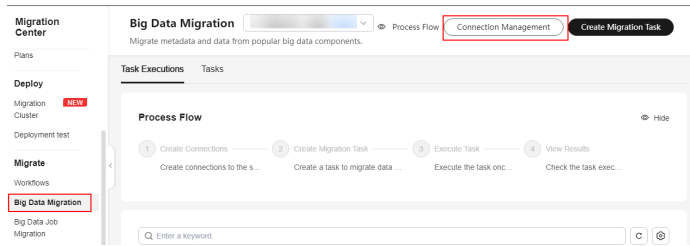
The source connection enables the MgC Agent (formerly Edge) to access and read data in Alibaba Cloud MaxCompute.

### **Prerequisites**

You have completed all [preparations](#).

### **Procedure**

- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select your **big data migration project** from the drop-down list.
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Migration**.
- Step 3** Click **Connection Management** in the upper right corner of the page.



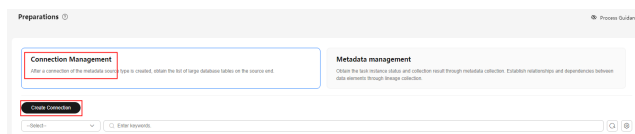
**Step 4** If you are performing a big data migration with MgC for the first time, select your MgC Agent to enable this migration feature. Click **Modify** in the upper left corner of the page or click **Select MgC Agent**. In the drop-down list, select the MgC Agent you connected to MgC in [Preparations](#).



Ensure that the selected MgC Agent is always **Online** and **Enabled** until your migration is complete.

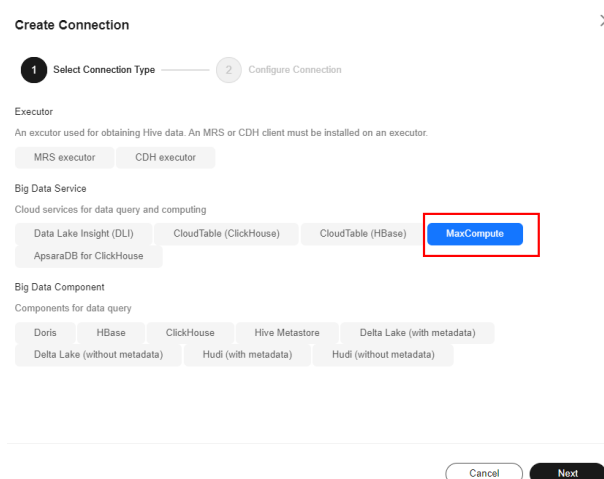
**Step 5** Click **Create Connection**.

**Figure 1-53** Creating a connection



**Step 6** On the **Select Connection Type** page, select **MaxCompute** and click **Next**.

**Figure 1-54** Selecting MaxCompute



**Step 7** Configure the [parameters for creating a MaxCompute connection](#), and click **Test**. If the test is successful, the connection is set up.



**Table 1-65** Parameters for creating a MaxCompute connection

| Parameter                | Configuration                                                                                                                                                                                        |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To            | Select <b>Source</b> .                                                                                                                                                                               |
| Connection Name          | The default name is <b>MaxCompute-4 random characters</b> (including letters and numbers). You can also customize a name.                                                                            |
| MgC Agent                | Select the MgC Agent you connected to MgC in <b>Preparations</b> .                                                                                                                                   |
| Alibaba Cloud Credential | Select the Alibaba Cloud credential (an AK/SK pair) you added to the MgC Agent in <b>Preparations</b> .                                                                                              |
| MaxCompute Project       | Enter the name of the MaxCompute project where the data to be migrated is managed. You can obtain the project name from the <b>Projects</b> page on the MaxCompute console.                          |
| Endpoint                 | Enter the VPC endpoint of the region where the MaxCompute project is located.<br><br>For details about the MaxCompute VPC endpoint in each region, see <b>Endpoints in different regions (VPC)</b> . |

After the source connection is created, you can view it in the list on the **Connection Management** page. If necessary, click **Modify** in the **Operation** column to modify the connection configuration.

----End

## 1.11.5 Creating a Target Connection

The target connection is used to write source data to DLI.

### Precautions

For a metadata migration, a DLI connection with an SQL queue configured is required.

For a data migration, two DLI connections are required: one with an SQL queue configured and the other with a general queue.

### Prerequisites

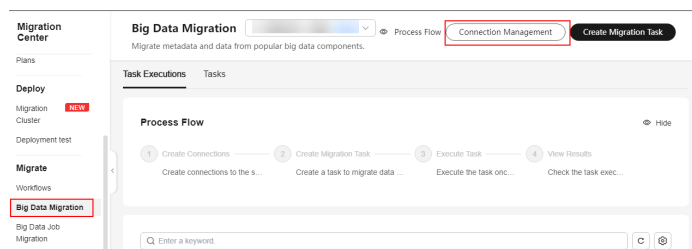
You have completed all **preparations**.

### Procedure

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select your **big data migration project** from the drop-down list.

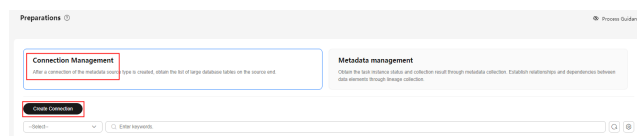
**Step 2** In the navigation pane on the left, choose **Migrate > Big Data Migration**.

**Step 3** Click **Connection Management** in the upper right corner of the page.



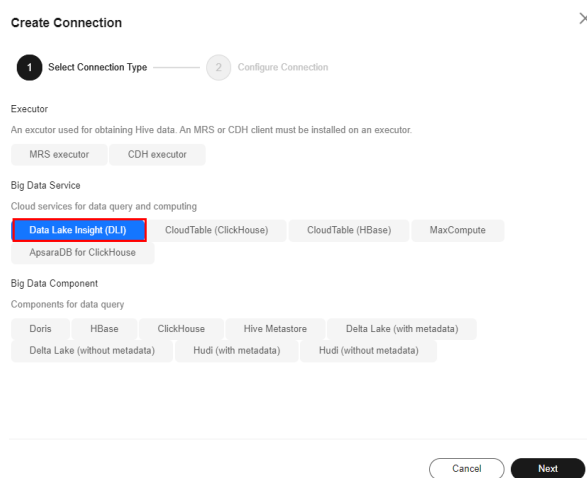
**Step 4** Click **Create Connection**.

**Figure 1-55** Creating a connection



**Step 5** On the **Select Connection Type** page, select **Data Lake Insight (DLI)** and click **Next**.


**Figure 1-56** Selecting DLI



**Step 6** Configure the parameters listed in [Table 1-66](#), and click **Test**. If the test is successful, the connection is set up.

**Table 1-66** Parameters for creating a DLI connection

| Parameter       | Configuration                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------|
| Connection To   | Select <b>Target</b> .                                                                                             |
| Connection Name | The default name is <b>DLI-4 random characters</b> (including letters and numbers). You can also customize a name. |
| MgC Agent       | Select the MgC Agent you connected to MgC in <a href="#">Preparations</a> .                                        |

| Parameter      | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DLI Credential | Select the Huawei Cloud credential (an AK/SK pair) you added to the MgC Agent in <a href="#">Preparations</a> . If the selected credential is the one you currently use to access MgC, you can select <b>This is my MgC credential</b> , and the projects in the region you choose will be listed.                                                                                                                           |
| Region         | Select the region where your DLI resources are located. If you do not select <b>This is my MgC credential</b> , you need to manually enter the region code, for example, <b>cn-north-1</b> .                                                                                                                                                                                                                                 |
| Project        | Select the project where your DLI resources are managed. Your source data will be managed in this project after being migrated. If you do not select <b>This is my MgC credential</b> , you need to manually enter the project ID. For details about how to obtain the project ID, see <a href="#">Obtaining Project Information</a> .<br> |
| Queue          | Enter the name of the SQL queue or general queue created in <a href="#">Purchasing an Elastic Resource Pool and Adding a Queue on DLI</a> . <ul style="list-style-type: none"> <li>• If you are creating a connection using an SQL queue, enter the name of the SQL queue.</li> <li>• If you are creating a connection using a general queue, enter the name of the general queue.</li> </ul>                                |

After the target connection is created, you can view it in the list on the **Connection Management** page. If necessary, click **Modify** in the **Operation** column to modify the connection configuration.

----End

## 1.11.6 Creating a Migration Task

### 1.11.6.1 Migrating Full Metadata

Migrate all metadata from source databases to Huawei Cloud DLI.

#### NOTICE

- MgC cannot migrate metadata of transaction tables (those with the **transactional=true** field in DDL statements).
- If a large number of tables are to be migrated or a single table contains a large number of columns, the migration may take a long time.

## Prerequisites

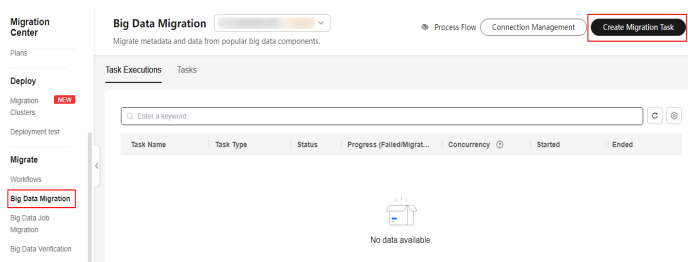
- You have completed all [preparations](#).
- [A source connection has been created](#).
- [Target connections have been created](#).

## Procedure

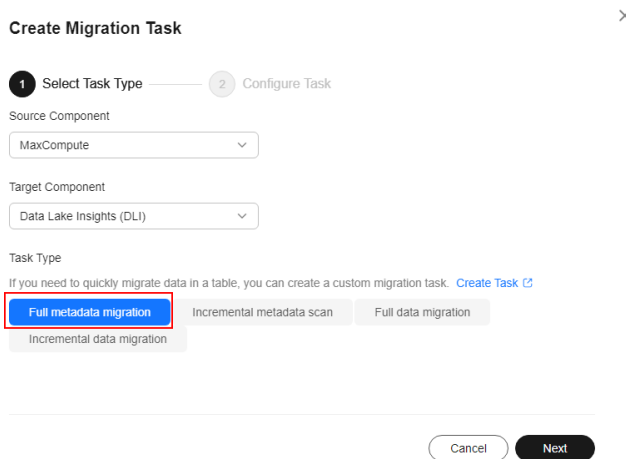
**Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select your **big data migration project** from the drop-down list.

**Step 2** In the navigation pane on the left, choose **Migrate > Big Data Migration**.

**Step 3** In the upper right corner of the page, click **Create Migration Task**.



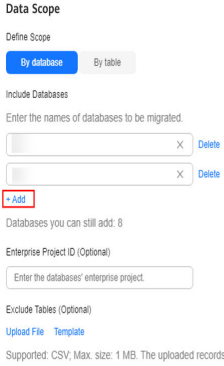
**Step 4** Select **MaxCompute** for **Source Component**, **Data Lake Insight (DLI)** for **Target Component**, and **Full metadata migration** for **Task Type**, and click **Next**.



**Step 5** Set parameters required for creating a full metadata migration task based on [Table 1-67](#).

**Table 1-67** Parameters required for creating a full metadata migration task

| Area           | Parameter | Configuration                                                                                                                                                 |
|----------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic Settings | Task Name | The default name is <b>Full-metadata-migration-from-MaxCompute-to-DLI-4 random characters</b> (including letters and numbers). You can also customize a name. |

| Area            | Parameter             | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | MgC Agent             | Select the MgC Agent you connected to MgC in <a href="#">Preparations</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Source Settings | Source Connection     | Select the <a href="#">source connection you created</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                 | MaxCompute Parameters | The parameters are optional and usually left blank. If needed, you can configure the parameters by referring to <a href="#">MaxCompute Documentation</a> .                                                                                                                                                                                                                                                                                                                                                                                            |
| Data Scope      | By database           | <p>Enter the names of databases to be migrated in the <b>Include Databases</b> text box. Click <b>Add</b> to add more entries. A maximum of 10 databases can be added.</p>  <p>To exclude certain tables from the migration, download the template in CSV format under <b>Exclude Tables</b>, add information about these tables to the template, and upload the template to MgC. For details, see steps <a href="#">Step 5.2</a> to <a href="#">Step 5.5</a>.</p> |

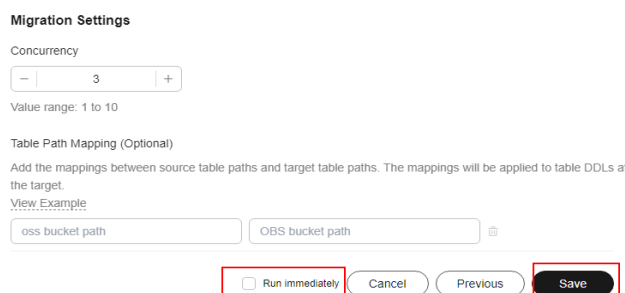
| Area            | Parameter                          | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | By table                           | <ol style="list-style-type: none"> <li>Download the template in CSV format.</li> <li>Open the downloaded CSV template file with Notepad.                             <p><b>CAUTION</b><br/>Do not use Excel to edit the CSV template file. The template file edited and saved in Excel cannot be identified by MgC.</p> </li> <li>Retain the first line in the CSV template file. From the second line onwards, enter the information about tables to be migrated in the format of {MaxCompute project name}, {Table name}. <i>MaxCompute project name</i> refers to the name of the MaxCompute project to be migrated. <i>Table name</i> refers to the data table to be migrated.                             <p><b>NOTICE</b></p> <ul style="list-style-type: none"> <li>Use commas (,) to separate the MaxCompute project name and the table name in each line. Do not use spaces or other separators.</li> <li>After adding the information about a table, press <b>Enter</b> to start a new line.</li> </ul> </li> <li>After all table information is added, save the changes to the CSV file.</li> <li>Upload the edited and saved CSV file to MgC.</li> </ol> |
|                 | Enterprise Project ID (Optional)   | Enter the ID of the enterprise project to which the target DLI databases belong. For details about how to obtain an enterprise project ID, see <a href="#">How Do I Obtain an Enterprise Project ID?</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                 | Convert Internal Table To External | <ul style="list-style-type: none"> <li>If you set this option to <b>No</b>, the migrated data will be stored in DLI.</li> <li>If you set this option to <b>Yes</b>, the migrated data will be stored in the OBS path you specify.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Target Settings | Overwriting Policy                 | <p>Select the policy for processing tables that already exist at the target.</p> <ul style="list-style-type: none"> <li><b>Skip:</b> Such tables will be skipped during the migration, and no operation will be performed on them.</li> <li><b>Rebuild:</b> Such tables and the data in them will be deleted from the target, and new empty tables will be created at the target based on the source table settings.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Area               | Parameter                     | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | Target Connection             | Select the <b>DLI connection with a SQL queue</b> you created.<br><b>CAUTION</b><br>Do not select the connection with a general queue configured.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                    | Custom Parameters             | Configure the parameters as needed. For details, see <b>Configuration parameter description</b> and <b>Custom Parameters</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                    | Table Type                    | Select an option as required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                    | File Format                   | Select an option as required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                    | Compression Format            | Select an option as required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Migration Settings | Concurrency                   | Set the number of concurrent migration subtasks. The default value is <b>3</b> . The value ranges from <b>1</b> to <b>10</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                    | (Optional) Table Path Mapping | <p>Map storage paths for metadata of external tables between the source and the target. This can help smoothly move the metadata of MaxCompute external tables from Alibaba OSS to Huawei Cloud OBS.</p> <p>The mapped paths in Huawei Cloud OBS must be created in advance. In the paths, the bucket names can be different, and other parts must be the same.</p> <p>Assume that at the source, external tables are stored in <b>oss://oss-cn-hangzhou.aliyuncs.com/ali-test/documents/example_table</b>. In the path, <b>oss-cn-hangzhou.aliyuncs.com</b> is the endpoint of the region where the involved bucket resides, <b>ali-test</b> is the bucket name, <b>documents</b> is the root directory of the bucket, and <b>example_table</b> stores metadata of external tables. We call it table directory below. When you configure a mapped target path, the root directory and the table directory must remain unchanged, for example, <b>obs://hw-test/documents/example_table</b>.</p> <p>Example:</p> <ul style="list-style-type: none"> <li>• Source: <b>oss://oss-cn-hangzhou.aliyuncs.com/ali-test/documents/example_table</b></li> <li>• Target: <b>obs://hw-test/documents/example_table</b></li> </ul> <p><b>NOTE</b><br/>The preceding path mapping is only an example.</p> |

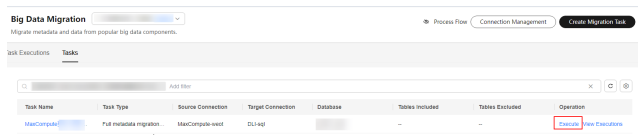
**Step 6** After the configuration is complete, execute the task.

**NOTICE**

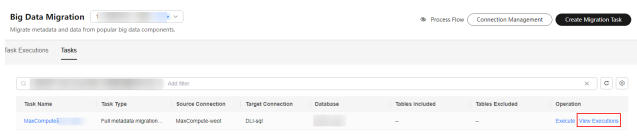
- A migration task can be executed repeatedly. Each time a migration task is executed, a task execution is generated.
- You can click the task name to modify the task configuration.
- You can select **Run immediately** and click **Save** to create the task and execute it immediately. You can view the created task on the **Tasks** page.



- You can also click **Save** to just create the task. You can view the created task on the **Tasks** page. To execute the task, click **Execute** in the **Operation** column.



**Step 7** After the migration task is executed, click **View Executions** in the **Operation** column. On the **Task Executions** tab, you can view the details of the running task execution and all historical executions.



Click **View** in the **Progress** column. On the displayed page, [view and export the task execution results](#).

----End

### 1.11.6.2 Scanning for Incremental Metadata

Identify the metadata that has changed in the source databases after the previous migration is complete, and synchronize the incremental metadata to Huawei Cloud CLI.



## Prerequisites

- **A source connection has been created.**
- **Target connections have been created.**
- At least a **full metadata migration** has been completed.

## Preparations

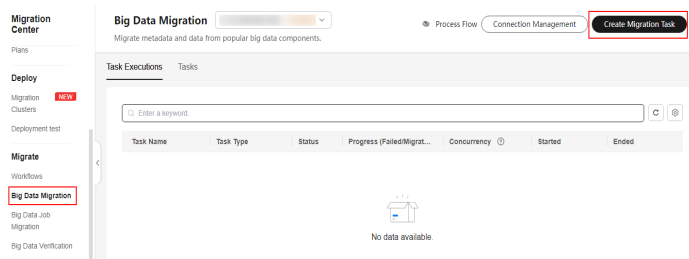
- Gain whitelist access to the Spark 3.3.1 feature.  
Contact technical support to whitelist you to use the Spark 3.3.1 feature.
- Configure a DLI job bucket.  
You need to purchase a bucket or parallel file system on OBS. The bucket is used to store temporary data generated by DLI. For details, see **Configuring a DLI Job Bucket**.

## Procedure

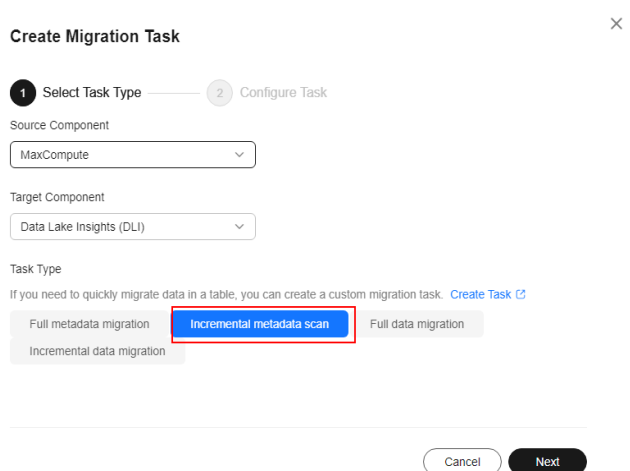
**Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select your **big data migration project** from the drop-down list.

**Step 2** In the navigation pane on the left, choose **Migrate > Big Data Migration**.

**Step 3** In the upper right corner of the page, click **Create Migration Task**.



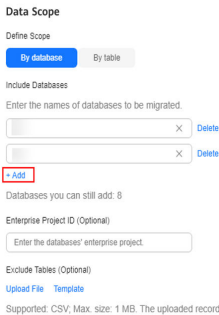
**Step 4** Select **MaxCompute** for **Source Component**, **Data Lake Insight (DLI)** for **Target Component**, and **Incremental metadata scan** for **Task Type**, and click **Next**.



**Step 5** Configure parameters required for creating an incremental metadata scan based on **Table 1-68**.

**Table 1-68** Parameters required for creating an incremental metadata scan

| Area            | Parameter                        | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic Settings  | Task Name                        | The default name is <b>Incremental-data-scan-of-MaxCompute-and-DLI-4 random characters</b> (including letters and numbers). You can also customize a name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                 | MgC Agent                        | Select the MgC Agent you connected to MgC in <a href="#">Preparations</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Source Settings | Source Connection                | Select the <a href="#">source connection you created</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                 | MaxCompute Parameters (Optional) | The parameters are optional and usually left blank. If needed, you can configure the parameters by referring to <a href="#">MaxCompute Documentation</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Data Scope      | Time Range                       | <ul style="list-style-type: none"><li>• If you select <b>All</b>, MgC will scan for the incremental metadata generated in the source databases since the last metadata migration.</li><li>• If you select <b>Custom</b>, select a <b>T-N</b> option to limit the scan scope to the incremental metadata generated within a specific time period (<math>24 \times N</math> hours) before the task start time (<b>T</b>). Assume that you select <b>T-1</b> and the task was executed at 14:50 on June 6, 2024. The system scans for incremental metadata generated from 14:50 on June 5, 2024 to 14:50 on June 6, 2024.</li></ul> <p><b>NOTICE</b><br/>The system only identifies and synchronizes metadata that has changed within the specified time range. Metadata that exists only at the source or the target will not be synchronized or processed.</p> |

| Area | Parameter   | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | By database | <p>Enter the names of databases to be scanned in the <b>Include Databases</b> text box. Click <b>Add</b> to add more entries. A maximum of 10 databases can be added.</p>  <p>To exclude certain tables from the scan, download the template in CSV format, add information about these tables to the template, and upload the template to MgC. For details, see steps <a href="#">Step 5.2</a> to <a href="#">Step 5.5</a>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|      | By table    | <ol style="list-style-type: none"> <li>Download the template in CSV format.</li> <li>Open the downloaded CSV template file with Notepad. <ul style="list-style-type: none"> <li><b>CAUTION</b><br/>Do not use Excel to edit the CSV template file. The template file edited and saved in Excel cannot be identified by MgC.</li> </ul> </li> <li>Retain the first line in the CSV template file. From the second line onwards, enter the information about tables to be migrated in the format of {MaxCompute project name}, {Table name}. <i>MaxCompute project name</i> refers to the name of the MaxCompute project to be migrated. <i>Table name</i> refers to the data table to be migrated. <ul style="list-style-type: none"> <li><b>NOTICE</b> <ul style="list-style-type: none"> <li>Use commas (,) to separate the MaxCompute project name and the table name in each line. Do not use spaces or other separators.</li> <li>After adding the information about a table, press <b>Enter</b> to start a new line.</li> </ul> </li> </ul> </li> <li>After all table information is added, save the changes to the CSV file.</li> <li>Upload the edited and saved CSV file to MgC.</li> </ol> |

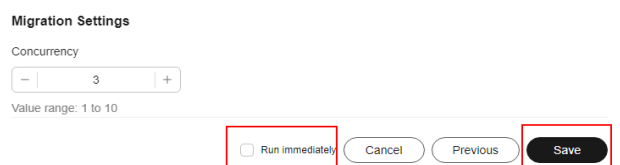
| Area               | Parameter                    | Configuration                                                                                                                                                                           |
|--------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Target Settings    | Target Connection            | Select the DLI connection with a SQL queue created in <a href="#">Creating a Target Connection</a> .<br><b>CAUTION</b><br>Do not select the connection with a general queue configured. |
|                    | Custom Parameters (Optional) | Configure the parameters as needed. For details, see <a href="#">Configuration parameter description</a> and <a href="#">Custom Parameters</a> .                                        |
| Migration Settings | Concurrency                  | Set the number of concurrent migration subtasks. The default value is <b>3</b> . The value ranges from <b>1</b> to <b>10</b> .                                                          |

**Step 6** After the configuration is complete, execute the task.

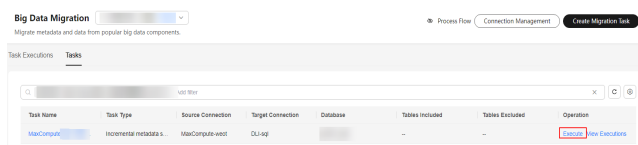
### NOTICE

- A migration task can be executed repeatedly. Each time a migration task is executed, a task execution is generated.
- You can click the task name to modify the task configuration.

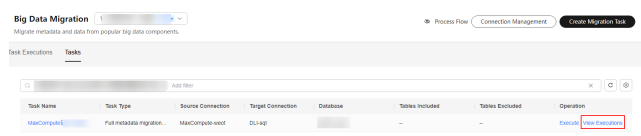
- You can select **Run immediately** and click **Save** to create the task and execute it immediately. You can view the created task on the **Tasks** page.



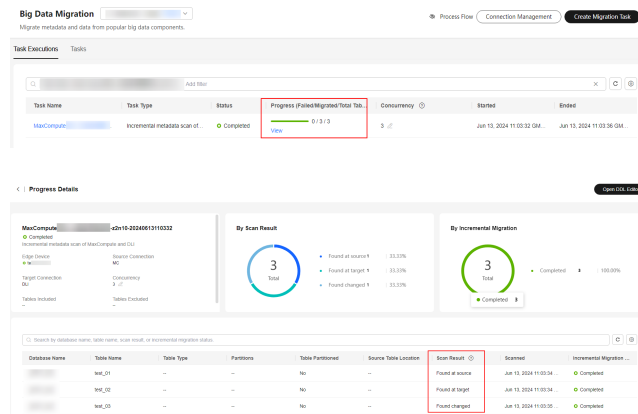
- You can also click **Save** to just create the task. You can view the created task on the **Tasks** page. To execute the task, click **Execute** in the **Operation** column.



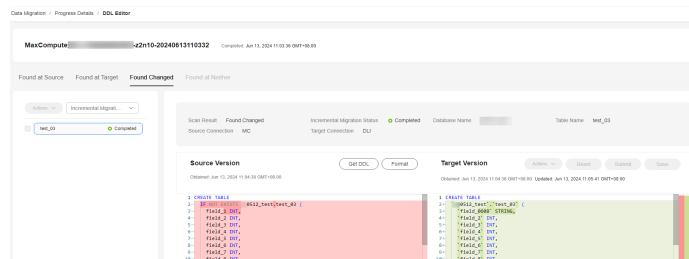
**Step 7** After the migration task is executed, click **View Executions** in the **Operation** column. On the **Task Executions** tab, you can view the details of the running task execution and all historical executions.



Click **View** in the **Progress** column. On the displayed **Progress Details** page, [view and export the incremental metadata scan results](#).



**Step 8** In the upper right corner of the progress details page, click **Open DDL Editor** to compare and edit the structures of incremental tables.



----End

### 1.11.6.3 Migrating Full Data

Migrate all data from source databases to Huawei Cloud DLI.

#### Notes

- If a large number of tables are to be migrated or a single table contains a large number of columns, the migration may take a long time.
- When partition data is migrated repeatedly, if the error message "Do not support update partition SerDeInfo for DLI table" is displayed, you need to manually delete the partition data from DLI and then migrate the data again.

#### Prerequisites

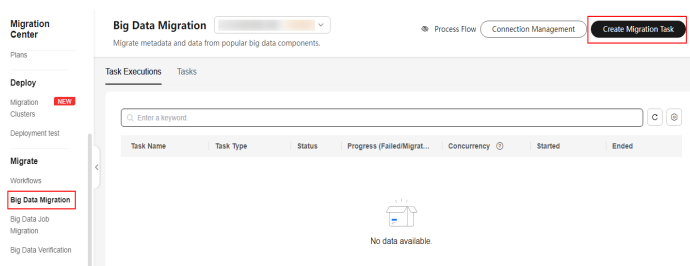
- You have completed all **preparations**.
- **A source connection has been created.**
- **Target connections have been created.**
- You have been added to the whitelist that allows JAR programs to access DLI metadata. If you have not, contact technical support.

#### Procedure

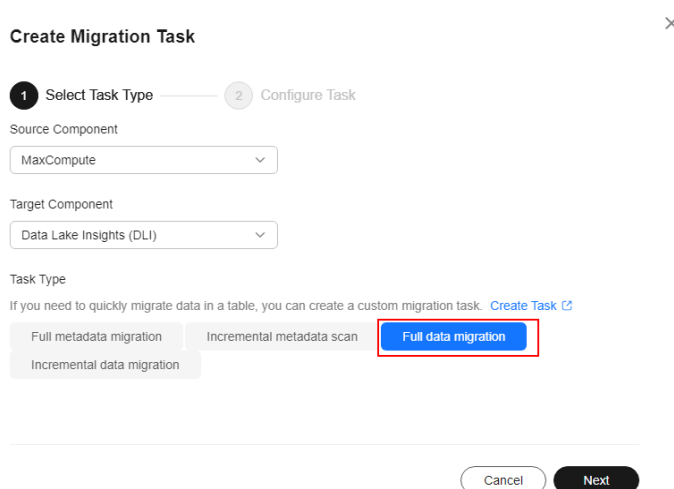
**Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select your **big data migration project** from the drop-down list.

**Step 2** In the navigation pane on the left, choose **Migrate > Big Data Migration**.

**Step 3** In the upper right corner of the page, click **Create Migration Task**.



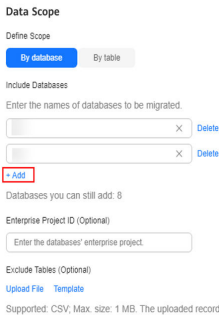
**Step 4** Select **MaxCompute** for **Source Component**, **Data Lake Insight (DLI)** for **Target Component**, **Full data migration** for **Task Type**, and click **Next**.



**Step 5** Configure parameters required for creating a full data migration task based on [Table 1-69](#).

**Table 1-69** Parameters required for creating a full data migration task

| Area            | Parameter                        | Configuration                                                                                                                                              |
|-----------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic Settings  | Task Name                        | The default name is <b>Full-data-migration-from-MaxCompute-to-DLI-4 random characters</b> (including letters and numbers). You can also customize a name.  |
|                 | MgC Agent                        | Select the MgC Agent you connected to MgC in <a href="#">Preparations</a> .                                                                                |
| Source Settings | Source Connection                | Select the <a href="#">source connection you created</a> .                                                                                                 |
|                 | MaxCompute Parameters (Optional) | The parameters are optional and usually left blank. If needed, you can configure the parameters by referring to <a href="#">MaxCompute Documentation</a> . |

| Area       | Parameter                                 | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data Scope | Estimated Project Period (Day) (Optional) | <p>If this parameter is set, the system checks table lifecycle during the migration. If the lifecycle of a table ends before the expected end time of the project, the table will be skipped. If this parameter is not set, all tables are migrated by default.</p>                                                                                                                                                                                                                                                      |
|            | By database                               | <p>Enter the names of databases to be migrated in the <b>Include Databases</b> text box. Click <b>Add</b> to add more entries. A maximum of 10 databases can be added.</p>  <p>To exclude certain tables from the migration, download the template in CSV format, add information about these tables to the template, and upload the template to MgC. For details, see steps <a href="#">Step 5.2</a> to <a href="#">Step 5.5</a>.</p> |

| Area            | Parameter         | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | By table          | <ol style="list-style-type: none"> <li>1. Download the template in CSV format.</li> <li>2. Open the downloaded CSV template file with Notepad.                             <p><b>CAUTION</b><br/>Do not use Excel to edit the CSV template file. The template file edited and saved in Excel cannot be identified by MgC.</p> </li> <li>3. Retain the first line in the CSV template file. From the second line onwards, enter the information about tables to be migrated in the format of {MaxCompute project name}, {Table name}. <i>MaxCompute project name</i> refers to the name of the MaxCompute project to be migrated. <i>Table name</i> refers to the data table to be migrated.                             <p><b>NOTICE</b></p> <ul style="list-style-type: none"> <li>- Use commas (,) to separate the MaxCompute project name and the table name in each line. Do not use spaces or other separators.</li> <li>- After adding the information about a table, press <b>Enter</b> to start a new line.</li> </ul> </li> <li>4. After all table information is added, save the changes to the CSV file.</li> <li>5. Upload the edited and saved CSV file to MgC.</li> </ol> |
| Target Settings | Target Connection | <p>Select the DLI connection with a general queue created in <a href="#">Creating a Target Connection</a>.</p> <p><b>CAUTION</b><br/>Do not a DLI connection with a SQL queue configured.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |



| Area                                                                  | Parameter                                                                          | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                  |   |                                                                       |                                             |   |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                                                       |   |                                                                       |                                                                                    |   |                                                                      |                                     |   |                                                                     |                                     |   |                                                          |                                                        |   |                                                                 |                                                        |   |
|-----------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------|---|--------------------------------------------------------|-------------------------------|---|----------------------------------------------------------------------|----------------------------------|---|-----------------------------------------------------------------------|---------------------------------------------|---|----------------------------------------------------------|-----------------------------------|---|--------------------------------------------------------|-------------------------------|---|----------------------------------------------------------------------|-----------------------------------------------------------------------|---|-----------------------------------------------------------------------|------------------------------------------------------------------------------------|---|----------------------------------------------------------------------|-------------------------------------|---|---------------------------------------------------------------------|-------------------------------------|---|----------------------------------------------------------|--------------------------------------------------------|---|-----------------------------------------------------------------|--------------------------------------------------------|---|
|                                                                       | Custom Parameters (Optional)                                                       | <p>Set the parameters as required. For details about the supported custom parameters, see <a href="#">Configuration parameters</a> and <a href="#">Custom parameters</a>.</p> <ul style="list-style-type: none"> <li>                     If the migration is performed over the Internet, set the following four parameters:                     <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p style="font-size: 0.8em; margin: 0;">Custom Parameters<br/>See custom parameters in the DLI documentation. <a href="#">View Documentation</a></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"><input type="text" value="spark.dli.metaAccess.enable"/></td> <td><input type="text" value="true"/></td> <td style="text-align: right; font-size: 0.7em;">✕</td> </tr> <tr> <td><input type="text" value="spark.dli.job.agency.name"/></td> <td><input type="text" value=""/></td> <td style="text-align: right; font-size: 0.7em;">✕</td> </tr> <tr> <td><input type="text" value="mgc.mc2dli.data.migration.dli.file.path"/></td> <td><input type="text" value="obs"/></td> <td style="text-align: right; font-size: 0.7em;">✕</td> </tr> <tr> <td><input type="text" value="mgc.mc2dli.data.migration.dli.spark.jars"/></td> <td><input "="" obs:="" type="text" value="["/></td> <td style="text-align: right; font-size: 0.7em;">✕</td> </tr> </table> <p style="font-size: 0.7em; margin: 0;"><a href="#">Add</a></p> </div> <ul style="list-style-type: none"> <li>– <b>spark.dli.metaAccess.enable</b>: Enter <b>true</b>.</li> <li>– <b>spark.dli.job.agency.name</b>: Enter the name of the <b>DLI agency you configured</b>.</li> <li>– <b>mgc.mc2dli.data.migration.dli.file.path</b>: Enter the <b>OBS path for storing the migration-dli-spark-1.0.0.jar package</b>. For example, <code>obs://mgc-test/data/migration-dli-spark-1.0.0.jar</code></li> <li>– <b>mgc.mc2dli.data.migration.dli.spark.jar s</b>: Enter the <b>OBS path for storing the fastjson-1.2.54.jar and datasource.jar packages</b>. The value is transferred in array format. Package names must be enclosed using double quotation marks and be separated with commas (,) For example: <code>["obs://mgc-test/data/datasource.jar","obs://mgc-test/data/fastjson-1.2.54.jar"]</code></li> </ul> <li>                     If the migration is performed over a private network, set the following eight parameters:                     <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p style="font-size: 0.8em; margin: 0;">Custom Parameters<br/>See custom parameters in the DLI documentation. <a href="#">View Documentation</a></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"><input type="text" value="spark.dli.metaAccess.enable"/></td> <td><input type="text" value="true"/></td> <td style="text-align: right; font-size: 0.7em;">✕</td> </tr> <tr> <td><input type="text" value="spark.dli.job.agency.name"/></td> <td><input type="text" value=""/></td> <td style="text-align: right; font-size: 0.7em;">✕</td> </tr> <tr> <td><input type="text" value="mgc.mc2dli.data.migration.dli.file.path"/></td> <td><input type="text" value="obs://mgc-test/data/migration-dli-spark-"/></td> <td style="text-align: right; font-size: 0.7em;">✕</td> </tr> <tr> <td><input type="text" value="mgc.mc2dli.data.migration.dli.spark.jars"/></td> <td><input data="" datasource.jar","oi"="" mgc-test="" obs:="" type="text" value="["/></td> <td style="text-align: right; font-size: 0.7em;">✕</td> </tr> <tr> <td><input type="text" value="spark.sql.catalog.mc_catalog.tableWrite"/></td> <td><input type="text" value="tunnel"/></td> <td style="text-align: right; font-size: 0.7em;">✕</td> </tr> <tr> <td><input type="text" value="spark.sql.catalog.mc_catalog.tableReac"/></td> <td><input type="text" value="tunnel"/></td> <td style="text-align: right; font-size: 0.7em;">✕</td> </tr> <tr> <td><input type="text" value="spark.hadoop.odps.end.point"/></td> <td><input type="text" value="http://service. maxcomput"/></td> <td style="text-align: right; font-size: 0.7em;">✕</td> </tr> <tr> <td><input type="text" value="spark.hadoop.odps.tunnel.end.point"/></td> <td><input type="text" value="http://dt. maxcompute.ali"/></td> <td style="text-align: right; font-size: 0.7em;">✕</td> </tr> </table> <p style="font-size: 0.7em; margin: 0;"><a href="#">Add</a></p> </div> <ul style="list-style-type: none"> <li>– <b>spark.dli.metaAccess.enable</b>: Enter <b>true</b>.</li> <li>– <b>spark.dli.job.agency.name</b>: Enter the name of the <b>DLI agency you configured</b>.</li> </ul> </li> </li></ul> | <input type="text" value="spark.dli.metaAccess.enable"/> | <input type="text" value="true"/> | ✕ | <input type="text" value="spark.dli.job.agency.name"/> | <input type="text" value=""/> | ✕ | <input type="text" value="mgc.mc2dli.data.migration.dli.file.path"/> | <input type="text" value="obs"/> | ✕ | <input type="text" value="mgc.mc2dli.data.migration.dli.spark.jars"/> | <input "="" obs:="" type="text" value="["/> | ✕ | <input type="text" value="spark.dli.metaAccess.enable"/> | <input type="text" value="true"/> | ✕ | <input type="text" value="spark.dli.job.agency.name"/> | <input type="text" value=""/> | ✕ | <input type="text" value="mgc.mc2dli.data.migration.dli.file.path"/> | <input type="text" value="obs://mgc-test/data/migration-dli-spark-"/> | ✕ | <input type="text" value="mgc.mc2dli.data.migration.dli.spark.jars"/> | <input data="" datasource.jar","oi"="" mgc-test="" obs:="" type="text" value="["/> | ✕ | <input type="text" value="spark.sql.catalog.mc_catalog.tableWrite"/> | <input type="text" value="tunnel"/> | ✕ | <input type="text" value="spark.sql.catalog.mc_catalog.tableReac"/> | <input type="text" value="tunnel"/> | ✕ | <input type="text" value="spark.hadoop.odps.end.point"/> | <input type="text" value="http://service. maxcomput"/> | ✕ | <input type="text" value="spark.hadoop.odps.tunnel.end.point"/> | <input type="text" value="http://dt. maxcompute.ali"/> | ✕ |
| <input type="text" value="spark.dli.metaAccess.enable"/>              | <input type="text" value="true"/>                                                  | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                  |   |                                                                       |                                             |   |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                                                       |   |                                                                       |                                                                                    |   |                                                                      |                                     |   |                                                                     |                                     |   |                                                          |                                                        |   |                                                                 |                                                        |   |
| <input type="text" value="spark.dli.job.agency.name"/>                | <input type="text" value=""/>                                                      | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                  |   |                                                                       |                                             |   |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                                                       |   |                                                                       |                                                                                    |   |                                                                      |                                     |   |                                                                     |                                     |   |                                                          |                                                        |   |                                                                 |                                                        |   |
| <input type="text" value="mgc.mc2dli.data.migration.dli.file.path"/>  | <input type="text" value="obs"/>                                                   | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                  |   |                                                                       |                                             |   |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                                                       |   |                                                                       |                                                                                    |   |                                                                      |                                     |   |                                                                     |                                     |   |                                                          |                                                        |   |                                                                 |                                                        |   |
| <input type="text" value="mgc.mc2dli.data.migration.dli.spark.jars"/> | <input "="" obs:="" type="text" value="["/>                                        | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                  |   |                                                                       |                                             |   |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                                                       |   |                                                                       |                                                                                    |   |                                                                      |                                     |   |                                                                     |                                     |   |                                                          |                                                        |   |                                                                 |                                                        |   |
| <input type="text" value="spark.dli.metaAccess.enable"/>              | <input type="text" value="true"/>                                                  | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                  |   |                                                                       |                                             |   |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                                                       |   |                                                                       |                                                                                    |   |                                                                      |                                     |   |                                                                     |                                     |   |                                                          |                                                        |   |                                                                 |                                                        |   |
| <input type="text" value="spark.dli.job.agency.name"/>                | <input type="text" value=""/>                                                      | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                  |   |                                                                       |                                             |   |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                                                       |   |                                                                       |                                                                                    |   |                                                                      |                                     |   |                                                                     |                                     |   |                                                          |                                                        |   |                                                                 |                                                        |   |
| <input type="text" value="mgc.mc2dli.data.migration.dli.file.path"/>  | <input type="text" value="obs://mgc-test/data/migration-dli-spark-"/>              | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                  |   |                                                                       |                                             |   |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                                                       |   |                                                                       |                                                                                    |   |                                                                      |                                     |   |                                                                     |                                     |   |                                                          |                                                        |   |                                                                 |                                                        |   |
| <input type="text" value="mgc.mc2dli.data.migration.dli.spark.jars"/> | <input data="" datasource.jar","oi"="" mgc-test="" obs:="" type="text" value="["/> | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                  |   |                                                                       |                                             |   |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                                                       |   |                                                                       |                                                                                    |   |                                                                      |                                     |   |                                                                     |                                     |   |                                                          |                                                        |   |                                                                 |                                                        |   |
| <input type="text" value="spark.sql.catalog.mc_catalog.tableWrite"/>  | <input type="text" value="tunnel"/>                                                | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                  |   |                                                                       |                                             |   |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                                                       |   |                                                                       |                                                                                    |   |                                                                      |                                     |   |                                                                     |                                     |   |                                                          |                                                        |   |                                                                 |                                                        |   |
| <input type="text" value="spark.sql.catalog.mc_catalog.tableReac"/>   | <input type="text" value="tunnel"/>                                                | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                  |   |                                                                       |                                             |   |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                                                       |   |                                                                       |                                                                                    |   |                                                                      |                                     |   |                                                                     |                                     |   |                                                          |                                                        |   |                                                                 |                                                        |   |
| <input type="text" value="spark.hadoop.odps.end.point"/>              | <input type="text" value="http://service. maxcomput"/>                             | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                  |   |                                                                       |                                             |   |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                                                       |   |                                                                       |                                                                                    |   |                                                                      |                                     |   |                                                                     |                                     |   |                                                          |                                                        |   |                                                                 |                                                        |   |
| <input type="text" value="spark.hadoop.odps.tunnel.end.point"/>       | <input type="text" value="http://dt. maxcompute.ali"/>                             | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                  |   |                                                                       |                                             |   |                                                          |                                   |   |                                                        |                               |   |                                                                      |                                                                       |   |                                                                       |                                                                                    |   |                                                                      |                                     |   |                                                                     |                                     |   |                                                          |                                                        |   |                                                                 |                                                        |   |

| Area               | Parameter                   | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                             | <ul style="list-style-type: none"> <li>- <b>mgc.mc2dli.data.migration.dli.file.path:</b> Enter the <a href="#">OBS path for storing the migration-dli-spark-1.0.0.jar package</a>. For example, <code>obs://mgc-test/data/migration-dli-spark-1.0.0.jar</code></li> <li>- <b>mgc.mc2dli.data.migration.dli.spark.jars:</b> Enter the <a href="#">OBS path for storing the fastjson-1.2.54.jar and datasource.jar packages</a>. The value is transferred in array format. Package names must be enclosed using double quotation marks and be separated with commas (,) For example: <code>["obs://mgc-test/data/datasource.jar","obs://mgc-test/data/fastjson-1.2.54.jar"]</code></li> <li>- <b>spark.sql.catalog.mc_catalog.tableWrite Provider:</b> Enter <code>tunnel</code>.</li> <li>- <b>spark.sql.catalog.mc_catalog.tableRead Provider:</b> Enter <code>tunnel</code>.</li> <li>- <b>spark.hadoop.odps.end.point:</b> Enter the VPC endpoint of the region where the source MaxCompute service is provisioned. For details about the MaxCompute VPC endpoint in each region, see <a href="#">Endpoints in different regions (VPC)</a>. For example, if the source MaxCompute service is located in Hong Kong, China, enter <code>http://service.cn-hongkong.maxcompute.aliyun-inc.com/api</code>.</li> <li>- <b>spark.hadoop.odps.tunnel.end.point:</b> Enter the VPC Tunnel endpoint of the region where the source MaxCompute service is located. For details about the MaxCompute VPC Tunnel endpoint in each region, see <a href="#">Endpoints in different regions (VPC)</a>. For example, if the source MaxCompute service is located in Hong Kong, China, enter <code>http://dt.cn-hongkong.maxcompute.aliyun-inc.com</code>.</li> </ul> |
| Migration Settings | Large Table Migration Rules | Control how large a table will be split into multiple migration subtasks. You are advised to retain the default settings. You can also change the settings as needed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Area | Parameter                    | Configuration                                                                                                                                                                                                                      |
|------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Small Table Migration Rules  | Control how small a table will be merged into one migration subtask along with other small tables. This can accelerate your migration. You are advised to retain the default settings. You can also change the settings as needed. |
|      | Concurrency                  | Set the number of concurrent migration subtasks. The default value is <b>3</b> . The value ranges from <b>1</b> to <b>10</b> .                                                                                                     |
|      | Max. SQL Statements Per File | SQL statements are generated for running migration commands. The number you set here limits how many SQL statements can be stored in a single file. The default value is <b>3</b> . The value ranges from <b>1</b> to <b>50</b> .  |

**Step 6** After the configuration is complete, execute the task.

**NOTICE**

- A migration task can be executed repeatedly. Each time a migration task is executed, a task execution is generated.
- You can click the task name to modify the task configuration.

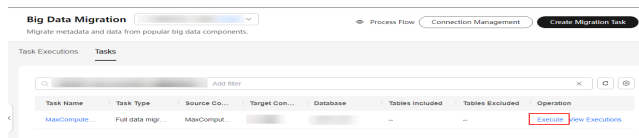
- You can select **Run immediately** and click **Save** to create the task and execute it immediately. You can view the created task on the **Tasks** page.

Concurrency  
 + -  
 Value range: 1 to 10

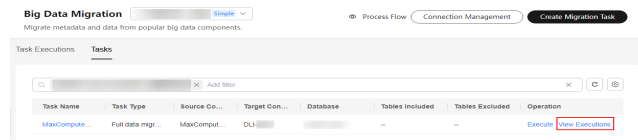
Max. SQL Statements Per File  
 + -  
 SQL statements are generated for running migration commands. The number you set here limits how many SQL statements can be stored in a single file. Value range: 1 to 50

Run immediately    Cancel    Previous    **Save**

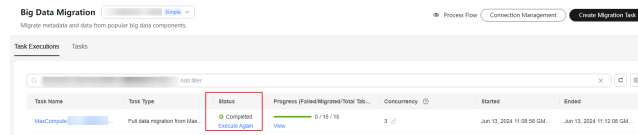
- You can also click **Save** to just create the task. You can view the created task on the **Tasks** page. To execute the task, click **Execute** in the **Operation** column.



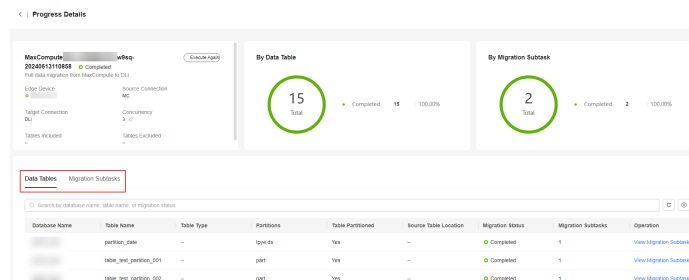
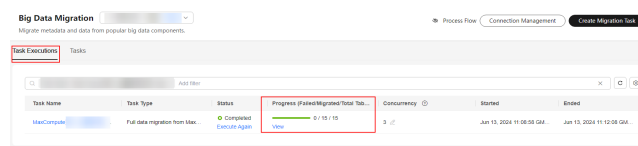
**Step 7** After the migration task is executed, click **View Executions** in the **Operation** column. On the **Task Executions** tab, you can view the details of the running task execution and all historical executions.



Click **Execute Again** in the **Status** column to run the execution again.



Click **View** in the **Progress** column. On the displayed **Progress Details** page, **view and export the task execution results**.



**Step 8** (Optional) After the data migration is complete, verify data consistency between the source and the target databases. For details, see [Verifying the Consistency of Data Migrated from MaxCompute to DLI](#).

----End

### 1.11.6.4 Migrating Incremental Data

Synchronize data that has been added, modified, or deleted after the previous migration is complete from source databases to Huawei Cloud DLI.

### Precautions

MgC allows you to narrow the migration scope to specific partitions in MaxCompute. You must enter the names of involved tables in the Excel template in lowercase letters. MaxCompute converts table names to lowercase during table creation. If the table names in the Excel template are in uppercase, the migration will fail as the tables cannot be recognized.

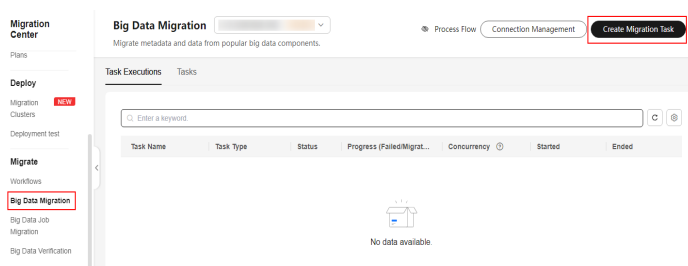
### Prerequisites

- You have completed all [preparations](#).
- [A source connection has been created](#).
- [Target connections have been created](#).

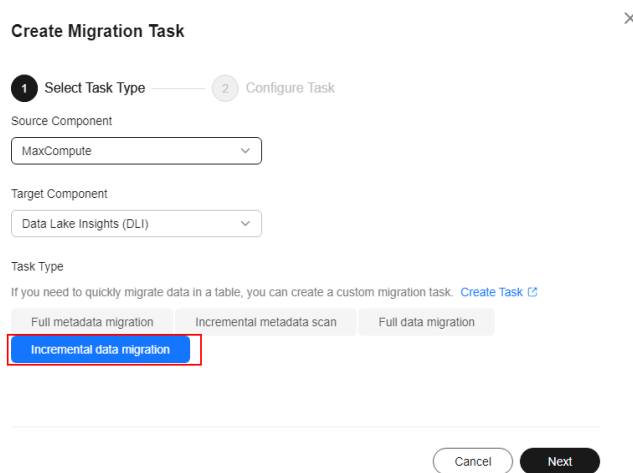
- At least one **full data migration** has been completed.
- You have been added to the whitelist that allows JAR programs to access DLI metadata. If you have not, contact technical support.

## Procedure

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select your **big data migration project** from the drop-down list.
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Migration**.
- Step 3** In the upper right corner of the page, click **Create Migration Task**.



- Step 4** Select **MaxCompute** for **Source Component**, **Data Lake Insight (DLI)** for **Target Component**, **Incremental data migration** for **Task Type**, and click **Next**.

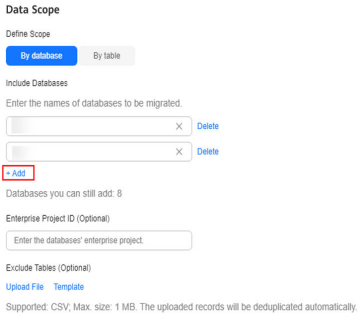


- Step 5** Configure parameters required for creating an incremental data migration task based on **Table 1-70**.

**Table 1-70** Parameters required for creating an incremental data migration task

| Area           | Parameter | Configuration                                                                                                                                                    |
|----------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic Settings | Task Name | The default name is <b>Incremental-data-migration-from-MaxCompute-to-DLI-4 random characters</b> (including letters and numbers). You can also customize a name. |
|                | MgC Agent | Select the MgC Agent you connected to MgC in <b>Preparations</b> .                                                                                               |

| Area            | Parameter                        | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Source Settings | Source Connection                | Select the <b>source connection you created</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                 | MaxCompute Parameters (Optional) | The parameters are optional and usually left blank. If needed, you can configure the parameters by referring to <b>MaxCompute Documentation</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Data Scope      | Migration Filter                 | <ul style="list-style-type: none"> <li>• <b>Time:</b> Select which incremental data to migrate based on when it was last changed. If you select this option, you need to set parameters such as <b>Time Range</b>, <b>Filter Partitions</b>, and <b>Define Scope</b>.</li> <li>• <b>Custom:</b> Migrate incremental data in specified partitions. If you select this option, perform the following steps to specify the partitions to be migrated:               <ol style="list-style-type: none"> <li>1. Under <b>Include Partitions</b>, click <b>Download Template</b> to download the template in CSV format.</li> <li>2. Open the downloaded CSV template file with Notepad.                   <p><b>CAUTION</b><br/>Do not use Excel to edit the CSV template file. The template file edited and saved in Excel cannot be identified by MgC.</p> </li> <li>3. Retain the first line in the CSV template file. From the second line onwards, enter the information about tables to be migrated in the format of {MaxCompute project name},{Table name},{Partition field},{Partition key}. <i>MaxCompute project name</i> refers to the name of the MaxCompute project where the data to be migrated is managed. <i>Table name</i> refers to the data table to be migrated.                   <p><b>NOTICE</b><br/>Use commas (,) to separate elements in each line. Do not use spaces or other separators.<br/>After adding the information about a table, press <b>Enter</b> to start a new line.</p> </li> <li>4. After all table information is added, save the changes to the CSV file.</li> <li>5. Under <b>Include Partitions</b>, click <b>Add File</b> and upload the edited and saved CSV file to MgC.</li> </ol> </li> </ul> |

| Area | Parameter         | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Time Range        | <p>Select a T-N option to limit the migration to the incremental data generated within a specific time period (24 × N hours) before the task start time (T). Assume that you select <b>T-1</b> and the task was executed at 14:50 on June 6, 2024. The system migrates incremental data generated from 14:50 on June 5, 2024 to 14:50 on June 6, 2024.</p> <p>If you select <b>Specified Date</b>, only incremental data generated on the specified date is migrated.</p>                                                                               |
|      | Filter Partitions | <p>Decide whether to filter partitions to be migrated by update time or by creation time. The default value is <b>By update time</b>.</p> <ul style="list-style-type: none"> <li>• Select <b>By update time</b> to migrate the data that was changed in the specified period.</li> <li>• Select <b>By creation time</b> to migrate the data that was created in the specified period.</li> </ul>                                                                                                                                                        |
|      | By database       | <p>Enter the names of databases where incremental data needs to be migrated in the <b>Include Databases</b> text box. Click <b>Add</b> to add more entries. A maximum of 10 databases can be added.</p>  <p>To exclude certain tables from the migration, download the template in CSV format, add information about these tables to the template, and upload the template to MgC. For details, see steps <a href="#">Step 5.2</a> to <a href="#">Step 5.5</a>.</p> |

| Area            | Parameter         | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | By table          | <ol style="list-style-type: none"> <li>1. Download the template in CSV format.</li> <li>2. Open the downloaded CSV template file with Notepad.                             <p><b>CAUTION</b><br/>Do not use Excel to edit the CSV template file. The template file edited and saved in Excel cannot be identified by MgC.</p> </li> <li>3. Retain the first line in the CSV template file. From the second line onwards, enter the information about tables to be migrated in the format of {MaxCompute project name}, {Table name}. <i>MaxCompute project name</i> refers to the name of the MaxCompute project to be migrated. <i>Table name</i> refers to the data table to be migrated.                             <p><b>NOTICE</b></p> <ul style="list-style-type: none"> <li>- Use commas (,) to separate the MaxCompute project name and the table name in each line. Do not use spaces or other separators.</li> <li>- After adding the information about a table, press <b>Enter</b> to start a new line.</li> </ul> </li> <li>4. After all table information is added, save the changes to the CSV file.</li> <li>5. Upload the edited and saved CSV file to MgC.</li> </ol> |
| Target Settings | Target Connection | <p>Select the DLI connection with a general queue created in <a href="#">Creating a Target Connection</a>.</p> <p><b>CAUTION</b><br/>Do not a DLI connection with a SQL queue configured.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |



| Area                                     | Parameter                                    | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |      |   |                           |  |   |                                         |     |   |                                          |                  |   |                             |      |   |                           |  |   |                                         |                                          |   |                                          |                                              |   |                                         |        |   |                                        |        |   |                             |                            |   |                                    |                             |   |
|------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------|---|---------------------------|--|---|-----------------------------------------|-----|---|------------------------------------------|------------------|---|-----------------------------|------|---|---------------------------|--|---|-----------------------------------------|------------------------------------------|---|------------------------------------------|----------------------------------------------|---|-----------------------------------------|--------|---|----------------------------------------|--------|---|-----------------------------|----------------------------|---|------------------------------------|-----------------------------|---|
|                                          | Custom Parameters (Optional)                 | <p>Set the parameters as required. For details about the supported custom parameters, see <a href="#">Configuration parameters</a> and <a href="#">Custom parameters</a>.</p> <ul style="list-style-type: none"> <li>                     If the migration is performed over the Internet, set the following four parameters:                     <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p style="font-size: small; margin: 0;">Custom Parameters<br/>See custom parameters in the DLI documentation. <a href="#">View Documentation</a></p> <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid #ccc; padding: 2px;">spark.dli.metaAccess.enable</td> <td style="border: 1px solid #ccc; padding: 2px;">true</td> <td style="font-size: x-small; text-align: right;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">spark.dli.job.agency.name</td> <td style="border: 1px solid #ccc; padding: 2px;"></td> <td style="font-size: x-small; text-align: right;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">mgc.mc2dli.data.migration.dli.file.path</td> <td style="border: 1px solid #ccc; padding: 2px;">obs</td> <td style="font-size: x-small; text-align: right;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">mgc.mc2dli.data.migration.dli.spark.jars</td> <td style="border: 1px solid #ccc; padding: 2px;">["obs://", "ol"]</td> <td style="font-size: x-small; text-align: right;">✕</td> </tr> </table> <p style="font-size: x-small; margin: 0;">Add</p> </div> <ul style="list-style-type: none"> <li>– <b>spark.dli.metaAccess.enable</b>: Enter <b>true</b>.</li> <li>– <b>spark.dli.job.agency.name</b>: Enter the name of the <b>DLI agency you configured</b>.</li> <li>– <b>mgc.mc2dli.data.migration.dli.file.path</b>: Enter the <b>OBS path for storing the migration-dli-spark-1.0.0.jar package</b>. For example, <code>obs://mgc-test/data/migration-dli-spark-1.0.0.jar</code></li> <li>– <b>mgc.mc2dli.data.migration.dli.spark.jar s</b>: Enter the <b>OBS path for storing the fastjson-1.2.54.jar and datasource.jar packages</b>. The value is transferred in array format. Package names must be enclosed using double quotation marks and be separated with commas (,) For example: <code>["obs://mgc-test/data/datasource.jar", "obs://mgc-test/data/fastjson-1.2.54.jar"]</code></li> </ul> <li>                     If the migration is performed over a private network, set the following eight parameters:                     <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p style="font-size: small; margin: 0;">Custom Parameters<br/>See custom parameters in the DLI documentation. <a href="#">View Documentation</a></p> <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid #ccc; padding: 2px;">spark.dli.metaAccess.enable</td> <td style="border: 1px solid #ccc; padding: 2px;">true</td> <td style="font-size: x-small; text-align: right;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">spark.dli.job.agency.name</td> <td style="border: 1px solid #ccc; padding: 2px;"></td> <td style="font-size: x-small; text-align: right;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">mgc.mc2dli.data.migration.dli.file.path</td> <td style="border: 1px solid #ccc; padding: 2px;">obs://mgc-test/data/migration-dli-spark-</td> <td style="font-size: x-small; text-align: right;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">mgc.mc2dli.data.migration.dli.spark.jars</td> <td style="border: 1px solid #ccc; padding: 2px;">["obs://mgc-test/data/datasource.jar", "ol"]</td> <td style="font-size: x-small; text-align: right;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">spark.sql.catalog.mc_catalog.tableWrite</td> <td style="border: 1px solid #ccc; padding: 2px;">tunnel</td> <td style="font-size: x-small; text-align: right;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">spark.sql.catalog.mc_catalog.tableReac</td> <td style="border: 1px solid #ccc; padding: 2px;">tunnel</td> <td style="font-size: x-small; text-align: right;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">spark.hadoop.odps.end.point</td> <td style="border: 1px solid #ccc; padding: 2px;">"http://service. maxcomput</td> <td style="font-size: x-small; text-align: right;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">spark.hadoop.odps.tunnel.end.point</td> <td style="border: 1px solid #ccc; padding: 2px;">"http://dt. maxcompute.ally</td> <td style="font-size: x-small; text-align: right;">✕</td> </tr> </table> <p style="font-size: x-small; margin: 0;">Add</p> <ul style="list-style-type: none"> <li>– <b>spark.dli.metaAccess.enable</b>: Enter <b>true</b>.</li> <li>– <b>spark.dli.job.agency.name</b>: Enter the name of the <b>DLI agency you configured</b>.</li> </ul> </div></li> </li></ul> | spark.dli.metaAccess.enable | true | ✕ | spark.dli.job.agency.name |  | ✕ | mgc.mc2dli.data.migration.dli.file.path | obs | ✕ | mgc.mc2dli.data.migration.dli.spark.jars | ["obs://", "ol"] | ✕ | spark.dli.metaAccess.enable | true | ✕ | spark.dli.job.agency.name |  | ✕ | mgc.mc2dli.data.migration.dli.file.path | obs://mgc-test/data/migration-dli-spark- | ✕ | mgc.mc2dli.data.migration.dli.spark.jars | ["obs://mgc-test/data/datasource.jar", "ol"] | ✕ | spark.sql.catalog.mc_catalog.tableWrite | tunnel | ✕ | spark.sql.catalog.mc_catalog.tableReac | tunnel | ✕ | spark.hadoop.odps.end.point | "http://service. maxcomput | ✕ | spark.hadoop.odps.tunnel.end.point | "http://dt. maxcompute.ally | ✕ |
| spark.dli.metaAccess.enable              | true                                         | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |      |   |                           |  |   |                                         |     |   |                                          |                  |   |                             |      |   |                           |  |   |                                         |                                          |   |                                          |                                              |   |                                         |        |   |                                        |        |   |                             |                            |   |                                    |                             |   |
| spark.dli.job.agency.name                |                                              | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |      |   |                           |  |   |                                         |     |   |                                          |                  |   |                             |      |   |                           |  |   |                                         |                                          |   |                                          |                                              |   |                                         |        |   |                                        |        |   |                             |                            |   |                                    |                             |   |
| mgc.mc2dli.data.migration.dli.file.path  | obs                                          | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |      |   |                           |  |   |                                         |     |   |                                          |                  |   |                             |      |   |                           |  |   |                                         |                                          |   |                                          |                                              |   |                                         |        |   |                                        |        |   |                             |                            |   |                                    |                             |   |
| mgc.mc2dli.data.migration.dli.spark.jars | ["obs://", "ol"]                             | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |      |   |                           |  |   |                                         |     |   |                                          |                  |   |                             |      |   |                           |  |   |                                         |                                          |   |                                          |                                              |   |                                         |        |   |                                        |        |   |                             |                            |   |                                    |                             |   |
| spark.dli.metaAccess.enable              | true                                         | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |      |   |                           |  |   |                                         |     |   |                                          |                  |   |                             |      |   |                           |  |   |                                         |                                          |   |                                          |                                              |   |                                         |        |   |                                        |        |   |                             |                            |   |                                    |                             |   |
| spark.dli.job.agency.name                |                                              | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |      |   |                           |  |   |                                         |     |   |                                          |                  |   |                             |      |   |                           |  |   |                                         |                                          |   |                                          |                                              |   |                                         |        |   |                                        |        |   |                             |                            |   |                                    |                             |   |
| mgc.mc2dli.data.migration.dli.file.path  | obs://mgc-test/data/migration-dli-spark-     | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |      |   |                           |  |   |                                         |     |   |                                          |                  |   |                             |      |   |                           |  |   |                                         |                                          |   |                                          |                                              |   |                                         |        |   |                                        |        |   |                             |                            |   |                                    |                             |   |
| mgc.mc2dli.data.migration.dli.spark.jars | ["obs://mgc-test/data/datasource.jar", "ol"] | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |      |   |                           |  |   |                                         |     |   |                                          |                  |   |                             |      |   |                           |  |   |                                         |                                          |   |                                          |                                              |   |                                         |        |   |                                        |        |   |                             |                            |   |                                    |                             |   |
| spark.sql.catalog.mc_catalog.tableWrite  | tunnel                                       | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |      |   |                           |  |   |                                         |     |   |                                          |                  |   |                             |      |   |                           |  |   |                                         |                                          |   |                                          |                                              |   |                                         |        |   |                                        |        |   |                             |                            |   |                                    |                             |   |
| spark.sql.catalog.mc_catalog.tableReac   | tunnel                                       | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |      |   |                           |  |   |                                         |     |   |                                          |                  |   |                             |      |   |                           |  |   |                                         |                                          |   |                                          |                                              |   |                                         |        |   |                                        |        |   |                             |                            |   |                                    |                             |   |
| spark.hadoop.odps.end.point              | "http://service. maxcomput                   | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |      |   |                           |  |   |                                         |     |   |                                          |                  |   |                             |      |   |                           |  |   |                                         |                                          |   |                                          |                                              |   |                                         |        |   |                                        |        |   |                             |                            |   |                                    |                             |   |
| spark.hadoop.odps.tunnel.end.point       | "http://dt. maxcompute.ally                  | ✕                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |      |   |                           |  |   |                                         |     |   |                                          |                  |   |                             |      |   |                           |  |   |                                         |                                          |   |                                          |                                              |   |                                         |        |   |                                        |        |   |                             |                            |   |                                    |                             |   |

| Area               | Parameter                   | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                             | <ul style="list-style-type: none"> <li>- <b>mgc.mc2dli.data.migration.dli.file.path:</b> Enter the <a href="#">OBS path for storing the migration-dli-spark-1.0.0.jar package</a>. For example, obs://mgc-test/data/migration-dli-spark-1.0.0.jar</li> <li>- <b>mgc.mc2dli.data.migration.dli.spark.jars:</b> Enter the <a href="#">OBS path for storing the fastjson-1.2.54.jar and datasource.jar packages</a>. The value is transferred in array format. Package names must be enclosed using double quotation marks and be separated with commas (,) For example: ["obs://mgc-test/data/datasource.jar","obs://mgc-test/data/fastjson-1.2.54.jar"]</li> <li>- <b>spark.sql.catalog.mc_catalog.tableWrite Provider:</b> Enter <b>tunnel</b>.</li> <li>- <b>spark.sql.catalog.mc_catalog.tableRead Provider:</b> Enter <b>tunnel</b>.</li> <li>- <b>spark.hadoop.odps.end.point:</b> Enter the VPC endpoint of the region where the source MaxCompute service is provisioned. For details about the MaxCompute VPC endpoint in each region, see <a href="#">Endpoints in different regions (VPC)</a>. For example, if the source MaxCompute service is located in Hong Kong, China, enter <b>http://service.cn-hongkong.maxcompute.aliyun-inc.com/api</b>.</li> <li>- <b>spark.hadoop.odps.tunnel.end.point:</b> Enter the VPC Tunnel endpoint of the region where the source MaxCompute service is located. For details about the MaxCompute VPC Tunnel endpoint in each region, see <a href="#">Endpoints in different regions (VPC)</a>. For example, if the source MaxCompute service is located in Hong Kong, China, enter <b>http://dt.cn-hongkong.maxcompute.aliyun-inc.com</b>.</li> </ul> |
| Migration Settings | Large Table Migration Rules | Control how large a table will be split into multiple migration subtasks. You are advised to retain the default settings. You can also change the settings as needed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

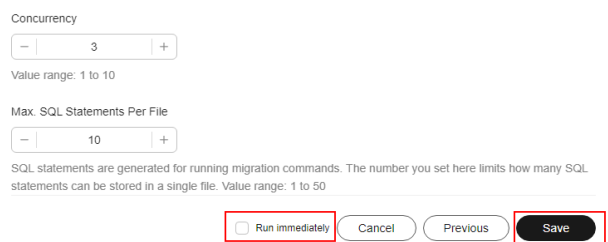
| Area | Parameter                    | Configuration                                                                                                                                                                                                                      |
|------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Small Table Migration Rules  | Control how small a table will be merged into one migration subtask along with other small tables. This can accelerate your migration. You are advised to retain the default settings. You can also change the settings as needed. |
|      | Concurrency                  | Set the number of concurrent migration subtasks. The default value is <b>3</b> . The value ranges from <b>1</b> to <b>10</b> .                                                                                                     |
|      | Max. SQL Statements per File | SQL statements are generated for running migration commands. The number you set here limits how many SQL statements can be stored in a single file. The default value is <b>3</b> . The value ranges from <b>1</b> to <b>50</b> .  |

**Step 6** After the configuration is complete, execute the task.

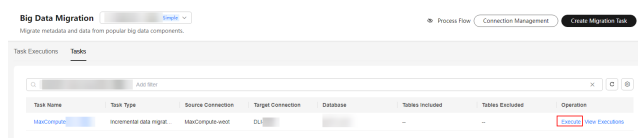
**NOTICE**

- A migration task can be executed repeatedly. Each time a migration task is executed, a task execution is generated.
- You can click the task name to modify the task configuration.

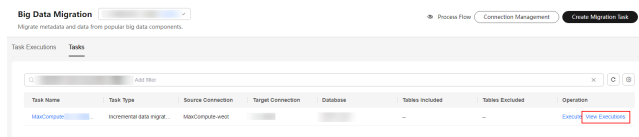
- You can select **Run immediately** and click **Save** to create the task and execute it immediately. You can view the created task on the **Tasks** page.



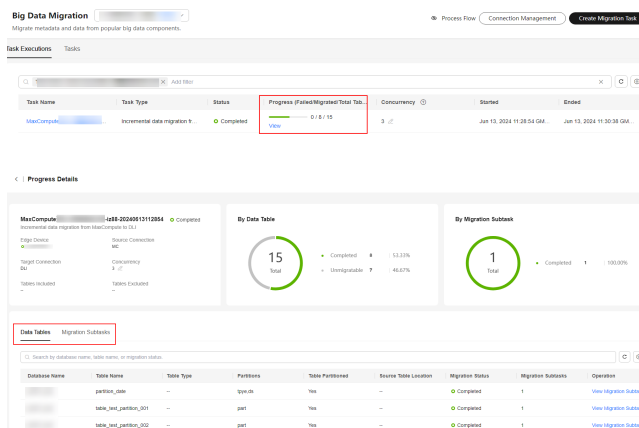
- You can also click **Save** to just create the task. You can view the created task on the **Tasks** page. To execute the task, click **Execute** in the **Operation** column.



**Step 7** After the migration task is executed, click **View Executions** in the **Operation** column. On the **Task Executions** tab, you can view the details of the running task execution and all historical executions.



Locate the running execution and click **View** in the **Progress** column. On the displayed **Progress Details** page, **view and export the task execution results**.



**Step 8** (Optional) After the data migration is complete, verify data consistency between the source and the target databases. For details, see [Verifying the Consistency of Data Migrated from MaxCompute to DLI](#).

----End

## 1.11.7 Viewing and Exporting Task Execution Results

Each time a migration task is executed, a task execution is generated. On the task execution details page, you can view and export the task execution results.

### NOTICE

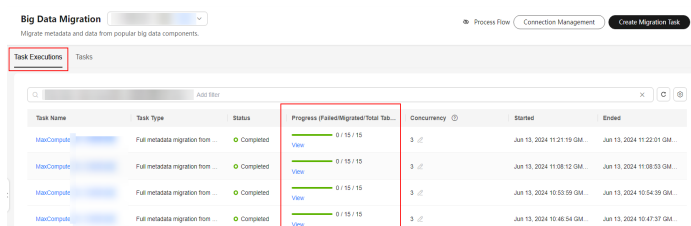
The exported files can be downloaded within 15 days of when they are generated but will be automatically deleted after that.

## Prerequisites

A migration task has been created and executed.

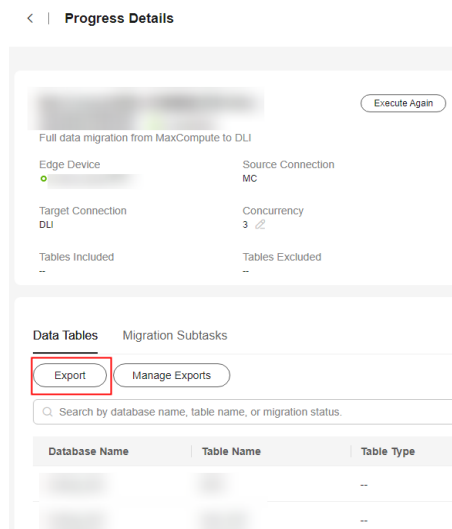
## Procedure

**Step 1** In the **Task Executions** page, locate a task execution and click **View** in the **Progress** column.



**Step 2** Under **Tables**, click **Export**. The system starts to export the task execution results. You can filter the task execution results and export only the filtered results.

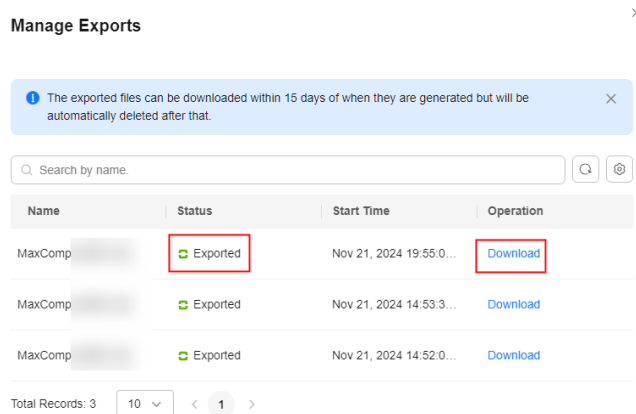
**Figure 1-57** Exporting execution results



**Step 3** After the export is complete, click **Manage Exports**.

**Step 4** After the export is complete, click **Download** in the **Operation** column to download the exported results.

**Figure 1-58** Downloading exported results



----End

## 1.11.8 Custom Parameters

For details about the custom parameters that can be configured for the target, see [Table 1-71](#) and [Configuration parameter description](#).

**Table 1-71** Supported custom parameters

| Parameter                                       | Value Range | Description                                                                                                                                                                                                                                                                                                                                                    | Mandatory                                  |
|-------------------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| spark.dli.metaAccess.enable                     | -           | Enter <b>true</b> .                                                                                                                                                                                                                                                                                                                                            | Yes                                        |
| spark.dli.job.agency.name                       |             | Enter the <b>DLI agency name</b> .                                                                                                                                                                                                                                                                                                                             |                                            |
| mgc.mc2dli.data.migration.dli.file.path         |             | Enter the <b>OBS path for storing the migration-dli-spark-1.0.0.jar package</b> . For example, obs://mgc-test/data/migration-dli-spark-1.0.0.jar                                                                                                                                                                                                               |                                            |
| mgc.mc2dli.data.migration.dli.spark.jars        |             | Enter the <b>OBS path for storing the fastjson-1.2.54.jar and datasource.jar packages</b> . The value is transferred in array format. Package names must be enclosed using double quotation marks and be separated with commas (,) For example: ["obs://mgc-test/data/datasource.jar","obs://mgc-test/data/fastjson-1.2.54.jar"]                               |                                            |
| spark.sql.catalog.mc_catalog.tableWriteProvider |             | Enter <b>tunnel</b> .                                                                                                                                                                                                                                                                                                                                          | Mandatory for migration over private lines |
| spark.sql.catalog.mc_catalog.tableReadProvider  |             | Enter <b>tunnel</b> .                                                                                                                                                                                                                                                                                                                                          |                                            |
| spark.hadoop.odps.endpoint                      |             | Enter the VPC endpoint of the region where the source MaxCompute service is provisioned. For details about the MaxCompute VPC endpoint in each region, see <b>Endpoints in different regions (VPC)</b> . For example, if the source MaxCompute service is located in Hong Kong, China, enter <b>http://service.cn-hongkong.maxcompute.aliyun-inc.com/api</b> . |                                            |

| Parameter                                   | Value Range                                                               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Mandatory |
|---------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| spark.hadoop.odps.tunnel.endpoint           |                                                                           | Enter the VPC Tunnel endpoint of the region where the source MaxCompute service is located. For details about the MaxCompute VPC Tunnel endpoint in each region, see <a href="#">Endpoints in different regions (VPC)</a> . For example, if the source MaxCompute service is located in Hong Kong, China, enter <b>http://dt.cn-hongkong.maxcompute.aliyun-inc.com</b> .                                                                                                                                                                                                                                                                      |           |
| spark.hadoop.odps.tunnel.quota.name         | -                                                                         | Enter the quota name used for accessing MaxCompute.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | No        |
| mgc.mc2dli.data.migration.mc.external.table | <ul style="list-style-type: none"> <li>• false</li> <li>• true</li> </ul> | Determine whether to migrate external tables. <ul style="list-style-type: none"> <li>• <b>false</b>: External tables are not migrated.</li> <li>• <b>true</b>: External tables are migrated.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                       | No        |
| sc_type                                     | A, B, and C                                                               | Specify the compute resource type. Currently, resource types A, B, and C are available. If this parameter is not specified, the minimum configuration (type A) is used. <ul style="list-style-type: none"> <li>• A: (vCPUs: 8; memory: 32 GB; driverCores: 2; executorCores: 1; driverMemory: 7 GB; executorMemory: 4 GB; and numExecutor: 6)</li> <li>• B: (vCPUs: 16; memory: 64 GB; driverCores: 2; executorCores: 2; driverMemory: 7 GB; executorMemory: 8 GB; and numExecutor: 7)</li> <li>• C: (vCPUs: 32; memory: 128 GB; driverCores: 4; executorCores: 2; driverMemory: 15 GB; executorMemory: 8 GB; and numExecutor: 14)</li> </ul> | No        |
| executorCores                               | 1–4                                                                       | Specify the number of CPU cores of each executor in a Spark application. This configuration will replace the default setting in <b>sc_type</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |           |
| numExecutors                                | 1–100                                                                     | Specify the number of executors in a Spark application. This configuration will replace the default setting in <b>sc_type</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |

| Parameter                        | Value Range                                                                   | Description                                                                                                                                                                                                                       | Mandatory |
|----------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| executorMemory                   | 1 – 16 GB                                                                     | Specify the executor memory of a Spark application, for example, <b>2 GB</b> or <b>2048 MB</b> . This configuration will replace the default setting in <b>sc_type</b> . The unit must be provided. Otherwise, the startup fails. |           |
| driverCores                      | 1–4                                                                           | Specify the number of CPU cores for the driver in a Spark application. This configuration will replace the default setting in <b>sc_type</b> .                                                                                    |           |
| driverMemory                     | 1 – 16 GB                                                                     | Specify the driver memory of a Spark application, for example, <b>2 GB</b> or <b>2048 MB</b> . This configuration will replace the default setting in <b>sc_type</b> . The unit must be provided. Otherwise, the startup fails.   |           |
| hive.exec.dynamic.partition.mode | <ul style="list-style-type: none"><li>• stri ct</li><li>• non stric</li></ul> | If you set <b>Migration Filter</b> to <b>Custom</b> when you create a migration task to migrate dynamic partition data, add this parameter and set it to <b>nonstric</b> .                                                        | No        |

## 1.12 Big Data Verification

### 1.12.1 Overview

MgC allows you to verify the consistency of data migrated from various big data computing and storage engines, such as Hive, HBase, Doris, and MaxCompute. Consistency verification ensures data accuracy and reliability and enables to you migrate big data to Huawei Cloud with confidence.

#### Precautions

- A pair of verification tasks for the source and the target must use the same verification method.
- If the source and target HBase clusters use different security authentication modes, the verification tasks cannot be executed at the same time, or they will fail to be executed. This is because the authentication information must be handled differently in each cluster. The secured cluster requires authentication information to be loaded, whereas the non-secured cluster needs that information cleared.



- If the source Lindorm or HBase service is locked due to arrears, you can still create data connections and verification tasks, but data access and operations will be restricted, preventing verification tasks from being executed. Before starting data verification, ensure that the source big data service is active and your account balance is sufficient. If the service is locked, promptly pay the fee to unlock it. Once the service is unlocked, you can execute the data verification tasks again.
- The verification results of data migrated between Hive 2.x and Hive 3.x may be inaccurate. In Hive 2.x, when you query the fixed-length type CHAR (N) of data, if the actual data length does not meet the specified length N, Hive will pad the string with spaces to reach the required length. However, in Hive 3.x, this padding operation does not occur during queries. This may result in differences between different versions. To avoid this issue, you are advised to use Beeline to perform the verification.
- When you YARN to run data verification at the source and target MRS clusters, execute the verification tasks separately. Ensure that one task is completed before starting another.
- When you verify data consistency for clusters of MRS 3.3.0 or later, do not use cluster nodes as executors, or the verification will fail.

## Notes and Constraints

- Before verifying data migrated from EMR Delta Lake to MRS Delta Lake, please note:
  - If the source EMR cluster uses Spark 3.3.1, data verification is supported regardless of whether the source cluster contains metadata storage.
  - If the source EMR cluster uses Spark 2.4.8, data verification is supported only when the source cluster contains metadata storage.
- Verification is not available for HBase tables that only store cold data.
- A verification task must be completed within one day. If the task extends past midnight (00:00), the verification results may be inaccurate. Plan verification tasks carefully to avoid execution across days.
- Field verification is not supported if the source Alibaba Cloud cluster uses ClickHouse 21.8.15.7 and the target Huawei Cloud cluster uses ClickHouse 23.3.2.37. This is because the two versions process IPv4 and IPv6 data types and function calculation results differently.
- During the daily incremental verification, hourly incremental verification, and date-based verification for Hive, partitions with a Date-type partition field that does not follow the standard YYYY-MM-DD format cannot be verified.
- MgC cannot verify the consistency of data migrated between secured HBase 2.x clusters. The accuracy of verification is impacted by version compatibility restrictions, differences in security authentication mechanisms, protocol and interface inconsistencies, as well as variations in feature support and configuration between different versions.

## Verification Methods

- **Full verification:** The consistency of all inventory data is verified.
- **Daily incremental verification:** The consistency of incremental data is verified based on the creation or update time. You can choose to verify incremental data for one day or several consecutive days.

- **Hourly incremental verification:** Data consistency is verified based on the creation time or update time multiple times within 24 hours. The verification automatically stops at 00:00 on the next day.
- **Date-based verification:** This method applies only to tables partitioned by date in the year, month, and day format. You can choose to verify consistency of such tables for one day or several consecutive days. Tables that are not partitioned by date are not verified.
- **Selective verification:** This method can be used to verify the consistency of the data within a specified time period. You can only select a period going backward from the current time for verification.

## Supported Source and Target Components

| Source Component                                                                                                                                                             | Target Component                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Hive</li> <li>• HBase</li> <li>• Doris</li> <li>• MaxCompute</li> <li>• ClickHouse</li> <li>• Delta Lake</li> <li>• Hudi</li> </ul> | <ul style="list-style-type: none"> <li>• Hive</li> <li>• DLI</li> <li>• MRS (Doris)</li> <li>• MRS (HBase)</li> <li>• MRS (ClickHouse)</li> <li>• CloudTable (ClickHouse)</li> <li>• CloudTable (HBase)</li> <li>• Delta</li> <li>• Hudi</li> </ul> |

## Verification Methods Available for Each Component

| Component  | Verification Method                                                                                                                                                                           |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hive       | <ul style="list-style-type: none"> <li>• Full verification</li> </ul>                                                                                                                         |
| DLI        | <ul style="list-style-type: none"> <li>• Daily incremental verification</li> <li>• Hourly incremental verification</li> <li>• Date-based verification</li> </ul>                              |
| MaxCompute | <ul style="list-style-type: none"> <li>• Full verification</li> <li>• Daily incremental verification</li> <li>• Hourly incremental verification</li> <li>• Date-based verification</li> </ul> |
| Doris      | <ul style="list-style-type: none"> <li>• Full verification</li> <li>• Daily incremental verification</li> <li>• Hourly incremental verification</li> </ul>                                    |
| HBase      | <ul style="list-style-type: none"> <li>• Full verification</li> <li>• Selective verification</li> </ul>                                                                                       |

| Component               | Verification Method                                                                                                                                                                      |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ClickHouse              | Full verification                                                                                                                                                                        |
| ApsaraDB for ClickHouse | Full verification                                                                                                                                                                        |
| CloudTable (HBase)      | <ul style="list-style-type: none"><li>• Full verification</li><li>• Selective verification</li></ul>                                                                                     |
| CloudTable (ClickHouse) | Full verification                                                                                                                                                                        |
| Delta                   | <ul style="list-style-type: none"><li>• Full verification</li><li>• Daily incremental verification</li><li>• Hourly incremental verification</li><li>• Date-based verification</li></ul> |
| Hudi                    | <ul style="list-style-type: none"><li>• Full verification</li><li>• Daily incremental verification</li><li>• Hourly incremental verification</li><li>• Date-based verification</li></ul> |

## 1.12.2 Preparations

Before using big data verification, complete the following preparations:

### Preparing a Huawei Account

Before using MgC, prepare a HUAWEI ID or an IAM user that can access MgC and obtain an AK/SK pair for the account or IAM user. For details, see [Preparations](#).

#### NOTE

When you create a metadata connection, if you want to collect and view resource usage information, assign the read-only permission (ReadOnly) for MRS and DLI to the IAM user.

### Creating a Big Data Migration Project

Migration projects allow you to group, isolate, and manage migration resources. For details, see [Managing Migration Projects](#).

### Installing the MgC Agent (Formerly Edge)

To verify big data consistency, you need to install the MgC Agent for Linux in your source environment. For details, see [Installing the MgC Agent for Linux](#). After the MgC Agent is installed, [connect the MgC Agent to MgC](#).

---

**CAUTION**

- When connecting the MgC Agent to MgC, save the entered AK/SK pair of your Huawei Cloud account as the target credentials, which will be used for migration later.
  - The MgC Agent does not support automatic restart. Do not restart the MgC Agent during task execution, or tasks will fail.
- 

## Enabling Big Data Verification

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select your **big data migration project** from the drop-down list.
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**.
- Step 3** Click **Select Edge Device**.
- Step 4** In the displayed dialog box, select the MgC Agent you connected to MgC from the drop-down list.
- If an MgC agent is **Online** and **Enabled**, it has been used for big data verification in a project. You can click **Confirm** to continue using this tool.
  - If an MgC agent is **Online** and **Disabled**, it has not been used for big data verification in any project, and you can click **Enable** to use this tool for big data verification in the current project.
  - If an MgC agent is **Offline** and **Deleted**, it has been deleted and cannot be used for big data verification. However, if this tool has been used for big data verification before being deleted, you can select it and click **View** to view the verification tasks and results.
  - If an MgC agent is **Offline** and **Disabled**, it cannot be used for big data verification, and all operation buttons are disabled even if you select it and click **View**.

---

**CAUTION**

Before performing big data verification, ensure that the selected MgC Agent is **Online** and **Enabled**.

---

----End

## 1.12.3 Creating a Source Connection

### 1.12.3.1 Creating a Connection to a Source Cloud Service

To verify the consistency of data stored using big data cloud services, you need to establish connections between MgC and the source and target cloud services.

The supported source big data cloud services include:

- MaxCompute

- ApsaraDB for ClickHouse

## Procedure

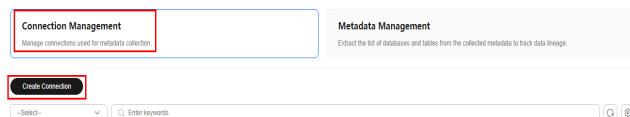
- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select a **big data migration project** from the drop-down list.
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**.
- Step 3** If you are performing a big data verification with MgC for the first time, select your MgC Agent to enable this feature. Click **Select MgC Agent**. In the displayed dialog box, select the **MgC Agent** you connected to MgC during preparations from the drop-down list.

### CAUTION

Ensure that the selected MgC Agent is always **Online** and **Enabled** before your verification is complete.

- Step 4** In the **Features** area, click **Preparations**.
- Step 5** Choose **Connection Management** and click **Create Connection**.

**Figure 1-59** Creating a connection



- Step 6** Select the big data cloud service you use and click **Next**.
- Step 7** Configure the connection parameters based on the big data cloud service you selected.
- [Parameters for creating a connection to MaxCompute](#)
  - [Parameters for creating a connection to ApsaraDB for ClickHouse](#)

**Table 1-72** Parameters for creating a connection to MaxCompute

| Parameter                | Configuration                                                                                                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To            | Select <b>Source</b> .                                                                                                                                                            |
| Connection Name          | The default name is <b>MaxCompute-4 random characters</b> (including letters and numbers). You can also customize a name.                                                         |
| MgC Agent                | Select the <b>MgC Agent you prepared</b> .                                                                                                                                        |
| Alibaba Cloud Credential | Select the credential of the source Alibaba Cloud account. For details about how to add credentials, see "Big data - MaxCompute" in <a href="#">Adding Resource Credentials</a> . |

| Parameter          | Configuration                                                                                                                                                                        |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MaxCompute Project | Enter the name of your MaxCompute project. You can obtain the project name from the MaxCompute console.                                                                              |
| Endpoint           | Enter the endpoint of the region where the MaxCompute project is located.<br>For details about MaxCompute endpoints in different regions, see <a href="#">MaxCompute Endpoints</a> . |

**Table 1-73** Parameters for creating a connection to ApsaraDB for ClickHouse

| Parameter             | Configuration                                                                                                                                                                                |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To         | Select <b>Source</b> .                                                                                                                                                                       |
| Connection Name       | The default name is <b>ApsaraDB for ClickHouse-4 random characters</b> (including letters and numbers). You can also customize a name.                                                       |
| MgC Agent             | Select the <a href="#">MgC Agent you prepared</a> .                                                                                                                                          |
| ClickHouse Credential | Select the ApsaraDB for ClickHouse credential added to the MgC Agent. For details about how to add credentials, see "Big data - ClickHouse" in <a href="#">Adding Resource Credentials</a> . |
| Database URL          | Enter the public address of the source ClickHouse cluster. You can view the IP address in the cluster details.                                                                               |

**Step 8** Click **Test**. MgC verifies whether the cloud service can be connected using the information you provided. If the test is successful, the connection can be set up.

**Step 9** After the connection test is successful, click **Confirm**. The cloud service connection is created.

**Step 10** On the **Connection Management** page, view the created connection and its basic information. In the **Operation** column, click **Modify** to modify the connection settings.

----End

### 1.12.3.2 Creating a Connection to a Source Component

To verify the consistency of data stored using big data components, you need to establish connections between MgC and the big data components.

The supported source big data components include:

- Doris
- HBase

- ClickHouse
- Hive Metastore
- Delta Lake (with metadata)
- Delta Lake (without metadata)
- Hudi (with metadata)
- Hudi (without metadata)

## Procedure

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select a **big data migration project** from the drop-down list.
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**.
- Step 3** If you are performing a big data verification with MgC for the first time, select your MgC Agent to enable this feature. Click **Select MgC Agent**. In the displayed dialog box, select the **MgC Agent** you connected to MgC during preparations from the drop-down list.

---

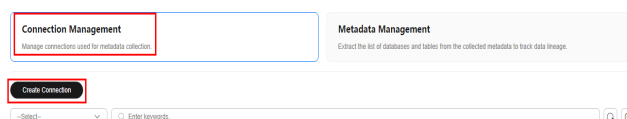
### CAUTION

Ensure that the selected MgC Agent is always **Online** and **Enabled** before your verification is complete.

---

- Step 4** In the **Features** area, click **Preparations**.
- Step 5** Choose **Connection Management** and click **Create Connection**.

**Figure 1-60** Creating a connection



- Step 6** Select a big data component and click **Next**.
- Step 7** Set parameters based on the big data component you selected.
- [Parameters for creating a connection to Doris](#)
  - [Parameters for creating a connection to HBase](#)
  - [Parameters for creating a connection to ClickHouse](#)
  - [Parameters for creating a connection to Hive Metastore](#)
  - [Parameters for creating a connection to Delta Lake \(with metadata\)](#)
  - [Parameters for creating a connection to Delta Lake \(without metadata\)](#)
  - [Parameters for creating a connection to Hudi \(with metadata\)](#)
  - [Parameters for creating a connection to Hudi \(without metadata\)](#)

**Table 1-74** Parameters for creating a connection to Doris

| Parameter           | Configuration                                                                                                                                                       |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To       | Select <b>Source</b> .                                                                                                                                              |
| Connection Name     | The default name is <b>Doris-4 random characters</b> (including letters and numbers). You can also customize a name.                                                |
| MgC Agent           | Select the <b>MgC Agent installed in the source environment</b> .                                                                                                   |
| Doris Credential    | Select the source Doris credential added to the MgC Agent. For details about how to add credentials, see "Big data - Doris" in <b>Adding Resource Credentials</b> . |
| Database IP Address | Enter the IP address for accessing the source Doris cluster.                                                                                                        |
| Database Port       | Enter the port used for accessing the source Doris cluster. The default value is 3306.                                                                              |
| Database Name       | Enter the name of the source Doris database.                                                                                                                        |



| Parameter                          | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collect Resource Usage Information | <p>This parameter is optional. If this option is enabled, usage metrics for your big data resources will be collected during the execution of tasks created using this connection. The collected information is used to generate reports on the MgC console and for performance optimization.</p> <p><b>NOTICE</b><br/>Before using this function, ensure that the Huawei Cloud account you added to the MgC Agent has the read-only permission for MRS and DLI.</p> <ul style="list-style-type: none"> <li>● If the selected credential is the one you currently use to access MgC, you can select <b>This is my MgC credential</b>, and the projects in the region you choose will be listed. <ul style="list-style-type: none"> <li>- Under <b>Region</b>, select the region where the data to be verified is located.</li> <li>- Under <b>Project</b>, select the project where the data to be verified is stored.</li> <li>- Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> <li>● If the selected Doris credential is not the one you currently use to access MgC: <ul style="list-style-type: none"> <li>- Under <b>Region ID</b>, enter the ID of the region where the data to be verified is located. For example, if the region is CN South-Guangzhou, enter <b>cn-south-1</b>.</li> <li>- Under <b>Project ID</b>, enter the project ID corresponding to the region.</li> <li>- Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>● To view the region ID and project ID, choose <b>My Credentials</b> &gt; <a href="#">API Credentials</a>.</li> <li>● For details about how to obtain the cluster ID, see <a href="#">Obtaining an MRS Cluster ID</a>.</li> </ul> |

**Table 1-75** Parameters for creating a connection to HBase

| Parameter       | Configuration                                                                                                        |
|-----------------|----------------------------------------------------------------------------------------------------------------------|
| Connection To   | Select <b>Source</b> .                                                                                               |
| Connection Name | The default name is <b>HBase-4 random characters</b> (including letters and numbers). You can also customize a name. |
| MgC Agent       | Select the <b>MgC Agent installed in the source environment</b> .                                                    |

| Parameter            | Configuration                                                                                                                                                                |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HBase Credential     | Select the source HBase credential added to the MgC Agent. For details about how to add credentials, see "Big data - HBase" in <a href="#">Adding Resource Credentials</a> . |
| Secured Cluster      | Choose whether the cluster is secured.                                                                                                                                       |
| ZooKeeper IP Address | Enter the IP address for connecting to the source ZooKeeper node. You can enter the public or private IP address of the ZooKeeper node.                                      |
| ZooKeeper Port       | Enter the port for connecting to the source ZooKeeper node.                                                                                                                  |
| HBase Version        | Select the source HBase version.                                                                                                                                             |

**Table 1-76** Parameters for creating a connection to ClickHouse

| Parameter                        | Configuration                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To                    | Select <b>Source</b> .                                                                                                                                                                                                                                                                                                                                        |
| Connection Name                  | The default name is <b>ClickHouse-4 random characters</b> (including letters and numbers). You can also customize a name.                                                                                                                                                                                                                                     |
| MgC Agent                        | Select the <a href="#">MgC Agent installed in the source environment</a> .                                                                                                                                                                                                                                                                                    |
| ClickHouse Credential (Optional) | Select the source ClickHouse credential added to the MgC Agent. For details about how to add credentials, see "Big data - ClickHouse" in <a href="#">Adding Resource Credentials</a> .                                                                                                                                                                        |
| Secured Cluster                  | Choose whether the cluster is secured.                                                                                                                                                                                                                                                                                                                        |
| ClickHouse Server IP Address     | Enter the IP address for accessing the source ClickHouse server. Generally, the IP address refers to that of the server where ClickHouse is hosted.                                                                                                                                                                                                           |
| HTTP Port                        | If the ClickHouse cluster is unsecured, enter the HTTP port for communicating with the ClickHouse server.<br>To obtain the value, log in to the <a href="#">FusionInsight Manager</a> of the source cluster, choose <b>Cluster &gt; Services &gt; ClickHouse &gt; Configurations &gt; All Configurations</b> , and search for the <b>http_port</b> parameter. |
| HTTP SSL/TLS Port                | If the source ClickHouse cluster is secured, enter the HTTPS port for communicating with the ClickHouse server.<br>To obtain the value, log in to the <a href="#">FusionInsight Manager</a> , choose <b>Cluster &gt; Services &gt; ClickHouse &gt; Configurations &gt; All Configurations</b> , and search for the <b>https_port</b> parameter.               |

| Parameter             | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collect Usage Metrics | <p>This parameter is optional. If this option is enabled, usage metrics for your big data resources will be collected during the execution of tasks created using this connection. The collected information is used to generate reports on the MgC console and for performance optimization.</p> <p><b>NOTICE</b><br/>Before using this function, ensure that the Huawei Cloud account you added to the MgC Agent has the read-only permission for MRS and DLI.</p> <ul style="list-style-type: none"> <li>• If the selected credential is the one you currently use to access MgC, you can select <b>This is my MgC credential</b>, and the projects in the region you choose will be listed. <ul style="list-style-type: none"> <li>– Under <b>Region</b>, select the region where the data to be verified is located.</li> <li>– Under <b>Project</b>, select the project where the data to be verified is stored.</li> <li>– Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> <li>• If the selected Doris credential is not the one you currently use to access MgC: <ul style="list-style-type: none"> <li>– Under <b>Region ID</b>, enter the ID of the region where the data to be verified is located. For example, if the region is CN South-Guangzhou, enter <b>cn-south-1</b>.</li> <li>– Under <b>Project ID</b>, enter the project ID corresponding to the region.</li> <li>– Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• To view the region ID and project ID, choose <b>My Credentials &gt; API Credentials</b>.</li> <li>• For details about how to obtain the cluster ID, see <a href="#">Obtaining an MRS Cluster ID</a>.</li> </ul> |

**Table 1-77** Parameters for creating a connection to Hive Metastore

| Parameter       | Configuration                                                                                                                 |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------|
| Connection To   | Select <b>Source</b> .                                                                                                        |
| Connection Name | The default name is <b>Hive-Metastore-4 random characters</b> (including letters and numbers). You can also customize a name. |

| Parameter                  | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Secure Connection          | Choose whether to enable secure connection. <ul style="list-style-type: none"><li>• If Hive Metastore is deployed in an unsecured cluster, do not enable secure connection.</li><li>• If Hive Metastore is deployed in a secured cluster, enable secure connection and provide access credentials. For details about how to obtain and add credentials to MgC, see "Big data - Hive Metastore" in <a href="#">Adding Resource Credentials</a>.</li></ul> |
| Hive Version               | Select the source Hive version.<br><b>CAUTION</b><br>If the source Hive version is 2.1.1, select <b>1.x</b> .                                                                                                                                                                                                                                                                                                                                            |
| Hive Metastore IP Address  | Enter the IP address for connecting to the Hive Metastore node.                                                                                                                                                                                                                                                                                                                                                                                          |
| Hive Metastore Thrift Port | Enter the port for connecting to the Hive Metastore Thrift service. The default port is 9083.                                                                                                                                                                                                                                                                                                                                                            |

| Parameter                    | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connect to Metadata Database | <p>During an incremental data verification, querying with Hive Metastore on more than 30,000 partitions may lead to a memory overflow (OOM) since all partition information is loaded into memory. Connecting to the MySQL metadata database can effectively prevent this issue.</p> <ul style="list-style-type: none"> <li>• If you disable this option, the system queries the information of Hive tables and partitions using Hive Metastore.</li> <li>• If you enable this option, configure the MySQL database information. The system will query the information of Hive tables and partitions through the MySQL database. You need to set the following parameters: <ul style="list-style-type: none"> <li>- <b>Metadata Database Type:</b> Only MySQL is supported.</li> <li>- <b>MySQL Credential:</b> Select the credential for accessing the MySQL database. You need to add the credential to the MgC Agent and synchronize it to MgC. For details, see <a href="#">Adding Resource Credentials</a>.</li> <li>- <b>MySQL Node IP Address:</b> Enter the IP address of the MySQL database server.</li> <li>- <b>MySQL Port:</b> Enter the port of the MySQL database service.</li> <li>- <b>Database Name:</b> Enter the name of the database that stores the Hive table metadata.</li> </ul> </li> </ul> <p><b>NOTE</b><br/>Ensure that the entered MySQL credential, node IP address, service port, and database name match the MySQL database used by Hive. Otherwise, data verification will fail.</p> |

**Table 1-78** Parameters for creating a connection to Delta Lake (with metadata)

| Parameter           | Configuration                                                                                                                                                     |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To       | Select <b>Source</b> .                                                                                                                                            |
| Connection Name     | The default name is <b>Delta-Lake-with-metadata-4 random characters</b> (including letters and numbers). You can also customize a name.                           |
| Executor Credential | Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in <a href="#">Adding Resource Credentials</a> . |
| Executor IP Address | Enter the IP address for connecting to the executor.                                                                                                              |

| Parameter                    | Configuration                                                                                                                                                                                                                                                                                        |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Executor Port                | Enter the port for connecting to the executor.                                                                                                                                                                                                                                                       |
| Spark Client Directory       | Enter the installation directory of the Spark client.                                                                                                                                                                                                                                                |
| Environment Variable Address | Enter the absolute path of the environment variable file (configuration file), for example, <b>/opt/bigdata/client/bigdata_env</b> .                                                                                                                                                                 |
| SQL File Location            | Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory.<br><b>NOTICE</b><br>After the migration is complete, you need to manually clear the folders generated at this location to release storage space. |

**Table 1-79** Parameters for creating a connection to Delta Lake (without metadata)

| Parameter                    | Configuration                                                                                                                                                                                                                                                                                        |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To                | Select <b>Source</b> .                                                                                                                                                                                                                                                                               |
| Connection Name              | The default name is <b>Delta-Lake-without-metadata-4 random characters</b> (including letters and numbers). You can also customize a name.                                                                                                                                                           |
| Executor Credential          | Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in <a href="#">Adding Resource Credentials</a> .                                                                                                                                    |
| Executor IP Address          | Enter the IP address for connecting to the executor.                                                                                                                                                                                                                                                 |
| Executor Port                | Enter the port for connecting to the executor.                                                                                                                                                                                                                                                       |
| Spark Client Directory       | Enter the installation directory of the Spark client.                                                                                                                                                                                                                                                |
| Environment Variable Address | Enter the absolute path of the environment variable file (configuration file), for example, <b>/opt/bigdata/client/bigdata_env</b> .                                                                                                                                                                 |
| SQL File Location            | Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory.<br><b>NOTICE</b><br>After the migration is complete, you need to manually clear the folders generated at this location to release storage space. |

| Parameter             | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collect Usage Metrics | <p>This parameter is optional. If this option is enabled, usage metrics for your big data resources will be collected during the execution of tasks created using this connection. The collected information is used to generate reports on the MgC console and for performance optimization.</p> <p><b>NOTICE</b></p> <p>Before using this function, ensure that the Huawei Cloud account you added to the MgC Agent has the read-only permission for MRS and DLI.</p> <ul style="list-style-type: none"> <li>• If the selected credential is the one you currently use to access MgC, you can select <b>This is my MgC credential</b>, and the projects in the region you choose will be listed. <ul style="list-style-type: none"> <li>– Under <b>Region</b>, select the region where the data to be verified is located.</li> <li>– Under <b>Project</b>, select the project where the data to be verified is stored.</li> <li>– Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> <li>• If the selected Doris credential is not the one you currently use to access MgC: <ul style="list-style-type: none"> <li>– Under <b>Region ID</b>, enter the ID of the region where the data to be verified is located. For example, if the region is CN South-Guangzhou, enter <b>cn-south-1</b>.</li> <li>– Under <b>Project ID</b>, enter the project ID corresponding to the region.</li> <li>– Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• To view the region ID and project ID, choose <b>My Credentials &gt; API Credentials</b>.</li> <li>• For details about how to obtain the cluster ID, see <a href="#">Obtaining an MRS Cluster ID</a>.</li> </ul> |

**Table 1-80** Parameters for creating a connection to Hudi (with metadata)

| Parameter       | Configuration                                                                                                                     |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Connection To   | Select <b>Source</b> .                                                                                                            |
| Connection Name | The default name is <b>Hudi-with-metadata-4 random characters</b> (including letters and numbers). You can also customize a name. |

| Parameter                    | Configuration                                                                                                                                                                                                                                                                                        |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Executor Credential          | Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in <a href="#">Adding Resource Credentials</a> .                                                                                                                                    |
| Executor IP Address          | Enter the IP address for connecting to the executor.                                                                                                                                                                                                                                                 |
| Executor Port                | Enter the port for connecting to the executor.                                                                                                                                                                                                                                                       |
| Spark Client Directory       | Enter the installation directory of the Spark client.                                                                                                                                                                                                                                                |
| Environment Variable Address | Enter the absolute path of the environment variable file (configuration file), for example, <b>/opt/bigdata/client/bigdata_env</b> .                                                                                                                                                                 |
| SQL File Location            | Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory.<br><b>NOTICE</b><br>After the migration is complete, you need to manually clear the folders generated at this location to release storage space. |

**Table 1-81** Parameters for creating a connection to Hudi (without metadata)

| Parameter                    | Configuration                                                                                                                                                                                                                                                                                        |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To                | Select <b>Source</b> .                                                                                                                                                                                                                                                                               |
| Connection Name              | The default name is <b>Hudi-without-metadata-4 random characters</b> (including letters and numbers). You can also customize a name.                                                                                                                                                                 |
| Executor Credential          | Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in <a href="#">Adding Resource Credentials</a> .                                                                                                                                    |
| Executor IP Address          | Enter the IP address for connecting to the executor.                                                                                                                                                                                                                                                 |
| Executor Port                | Enter the port for connecting to the executor.                                                                                                                                                                                                                                                       |
| Spark Client Directory       | Enter the installation directory of the Spark client.                                                                                                                                                                                                                                                |
| Environment Variable Address | Enter the absolute path of the environment variable file (configuration file), for example, <b>/opt/bigdata/client/bigdata_env</b> .                                                                                                                                                                 |
| SQL File Location            | Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory.<br><b>NOTICE</b><br>After the migration is complete, you need to manually clear the folders generated at this location to release storage space. |



- Step 8** Click **Test**. MgC verifies whether the component can be connected using the information you provided. If the test is successful, the connection can be set up.
- Step 9** After the connection test is successful, click **Confirm**. The connection is created.
- Step 10** On the **Connection Management** page, view the created connection and its basic information. In the **Operation** column, click **Modify** to modify the connection settings.

----End

## 1.12.4 Creating a Table Group and Adding Tables to the Group

Group source tables before verifying their consistency.

### Notes and Constraints

- A maximum of 10,000 tables can be imported at a time.
- The tables to be imported must come from the same metadata source.
- When a table is imported, the system does not verify how many table groups the table is added to or what verification rules are configured for those groups. You are advised to import a table into a maximum of three table groups with different verification rules.
- When you create a table group for verifying the consistency of data migrated from MaxCompute to DLI, you are advised to configure basic verification rules, such as **count**, **sum**, and **allsum**, for the group. After all the verification rules are met and the data volumes at the source and the target are the same, you can create a table group with the **content** verification rule to verify the content consistency.

### Prerequisites

- You have completed all [preparations](#).
- [A source connection has been created](#).

### Creating a Table Group

- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select a [big data migration project](#) from the drop-down list.
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**.
- Step 3** In the **Features** area, click **Table Management**.
- Step 4** Under **Table Groups**, click **Create**.
- Step 5** Configure the parameters listed in [Table 1-82](#).

**Table 1-82** Parameters for creating a table group

| Parameter              | Description                                                                                                                                                                                           |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Table Group            | Enter a name.                                                                                                                                                                                         |
| Metadata Source        | Select the <a href="#">created source connection</a> .<br><b>CAUTION</b><br>A table group can only contain tables coming from the same metadata source.                                               |
| Verification Rule      | Select the method for verifying data consistency and the inconsistency tolerance. MgC provides multiple verification rules for you to choose. For details about these rules, click <b>View More</b> . |
| Description (Optional) | Enter a description to identify the table group.                                                                                                                                                      |

**Step 6** Click **Confirm**. The table group is created. In the table group list, you can view information about the created table group.

After the table group is created, you can add tables to the table group by referring to [Adding Tables to a Table Group](#).

----End

## Adding Tables to a Table Group

**Step 1** On the **Table Management** page, click the **Tables** tab.

**Step 2** Choose **Table Management > Import** above the list.

**Step 3** Select a metadata connection and the table groups that tables are added to.

**Step 4** Click **Download** to download the import template to the local PC. Open the import template and fill in the information of the tables to be added.

### NOTICE

- A maximum of 10,000 tables can be imported at a time.
- Tables in a table group must come from the same metadata source.
- Cells in the template must not contain formulas and must be in text format. Otherwise, the table parsing will fail.
- If a Delta Lake (with metadata) or Hudi (with metadata) connection is selected for **Metadata Connection**, the **source\_path** parameter in the template is mandatory.
- If a Delta Lake (without metadata) or Hudi (without metadata) connection is selected for **Metadata Connection**, the **source\_path** and **target\_path** parameters in the template are mandatory.

**Step 5** Go back to the console and click **Select File** to upload the populated template to MgC.

**Step 6** Click **Confirm**. Then you can view the tables in the table list.

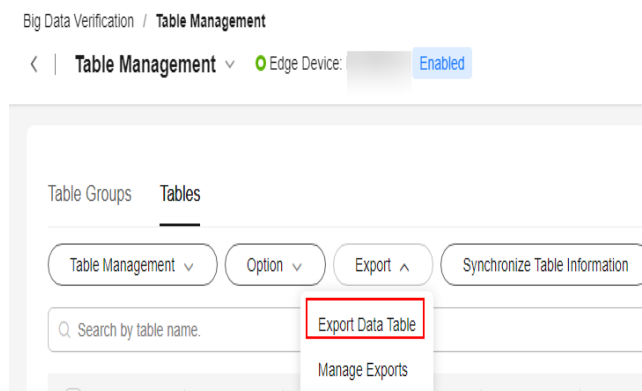
----End

## Exporting Data Tables

You can export information about tables from Delta Lake (with metadata) and Hudi (with metadata) to CSV files. Information about data tables from sources without metadata cannot be exported.

**Step 1** On the **Table Management** page, click the **Tables** tab.

**Step 2** Choose **Export > Export Data Table** above the list.



**Step 3** Select the table groups that contain the data tables to be exported and click **Confirm**.

**Step 4** After the export is complete, choose **Export > Manage Exports**.

**Step 5** Click **Download** in the **Operation** column to download the data table information to the local PC.

----End

## 1.12.5 Creating a Target Connection

### 1.12.5.1 Creating an Executor Connection

Executors are used to obtain data for consistency verification from the source and the target.

You need to connect the source and target executors to MgC, so that they can receive and execute commands from MgC. The supported big data components include:

- Hive Metastore
- Delta Lake (with metadata)
- Delta Lake (without metadata)
- Hudi (with metadata)
- Hudi (without metadata)

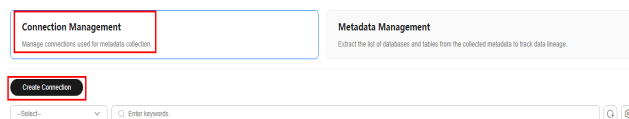
**CAUTION**

- Ensure that CLI clients are installed on both the source and target executors.
- You need to create connections to both the source and target executors.

**Procedure**

- Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select a **big data migration project** from the drop-down list.
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**.
- Step 3** In the **Features** area, click **Preparations**.
- Step 4** Choose **Connection Management** and click **Create Connection**.

**Figure 1-61** Creating a connection



- Step 5** Select an executor, click **Next**, and set connection parameters based on **Table 1-83**.

**Table 1-83** Parameters for creating an executor connection

| Parameter              | Configuration                                                                                                                                                          |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To          | Select an option as required.<br><b>NOTICE</b><br>The CDH executor supports only the migration source. The MRS executor supports both the migration source and target. |
| Connection Name        | The default name is <i>Executor type-4</i> random characters (including letters and numbers). You can also customize a name.                                           |
| MgC Agent              | Select the <b>MgC Agent installed in the source environment</b> .                                                                                                      |
| Executor Credential    | Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in <b>Adding Resource Credentials</b> .               |
| Executor IP Address    | Enter the IP address for connecting to the executor.                                                                                                                   |
| Executor Port          | Enter the port for connecting to the executor. The default port is <b>22</b> .                                                                                         |
| Installation Directory | Enter the installation directory of the MRS or CDH client. That is, the directory where <b>./install.sh</b> is installed.                                              |

| Parameter         | Configuration                                                                                                                                                                                                                                                                                                    |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SQL File Location | <p>Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the folder.</p> <p><b>NOTICE</b><br/>After the verification is complete, you need to manually clear the folders generated at this location to release storage space.</p> |

**Step 6** Click **Test**. MgC verifies whether the executor can be connected using the configuration information. If the test is successful, the executor can be connected.

**Step 7** After the connection test is successful, click **Confirm**. The executor connection is created.

**Step 8** On the **Connection Management** page, view the created connection and its basic information. In the **Operation** column, click **Modify** to modify the connection settings.

----End

### 1.12.5.2 Creating a Connection to a Target Cloud Service

To verify the consistency of data stored using big data cloud services, you need to establish connections between MgC and the source and target cloud services.

The supported target big data cloud services include:

- Data Lake Insight (DLI)
- CloudTable (ClickHouse)
- CloudTable (HBase)

#### Procedure

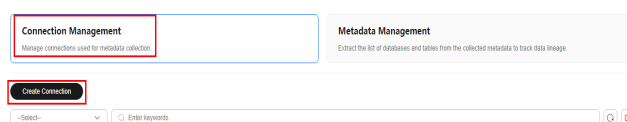
**Step 1** Sign in to the **MgC console**. In the navigation pane, under **Project**, select a **big data migration project** from the drop-down list.

**Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**.

**Step 3** In the **Features** area, click **Preparations**.

**Step 4** Choose **Connection Management** and click **Create Connection**.

**Figure 1-62** Creating a connection



**Step 5** Select a big data cloud service and click **Next**.

**Step 6** Configure the connection parameters based on the big data service you selected.

- **Parameters for creating a connection to DLI**

- [Parameters for creating a connection to CloudTable \(ClickHouse\)](#)
- [Parameters for creating a connection to CloudTable \(HBase\)](#)

**Table 1-84** Parameters for creating a connection to DLI

| Parameter             | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To         | Select <b>Target</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Connection Name       | The default name is <b>DLI-4 random characters</b> (including letters and numbers). You can also customize a name.                                                                                                                                                                                                                                                                                                                                       |
| MgC Agent             | Select the <b>MgC Agent installed in the source environment</b> .                                                                                                                                                                                                                                                                                                                                                                                        |
| DLI Credential        | Select the credential used for accessing DLI. For details about how to add credentials, see "Big data - DLI" in <a href="#">Adding Resource Credentials</a> . If the selected credential is the one you currently use to access MgC, you can select <b>This is my MgC credential</b> , and the projects in the region you choose will be listed.                                                                                                         |
| Region ID             | Enter the code of the target region where the data to be verified is located, for example, ap-southeast-1. For details about region codes, see <a href="#">Endpoints</a> .                                                                                                                                                                                                                                                                               |
| Project ID            | Enter the ID of the project where the data to be verified is managed. For details about how to obtain the project ID, see <a href="#">Obtaining Project Information</a> .                                                                                                                                                                                                                                                                                |
| Queue                 | Enter the name of the DLI queue to be verified. The queue must be a SQL queue.                                                                                                                                                                                                                                                                                                                                                                           |
| Collect Usage Metrics | This parameter is optional. If this option is enabled, usage metrics for your big data resources will be collected during the execution of tasks created using this connection. The collected information is used to generate reports on the MgC console and for performance optimization.<br><b>NOTICE</b><br>Before using this function, ensure that the Huawei Cloud account you added to the MgC Agent has the read-only permission for MRS and DLI. |

**Table 1-85** Parameters required for creating a connection to CloudTable (ClickHouse)

| Parameter       | Configuration                                                                                                                       |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Connection To   | Select <b>Target</b> .                                                                                                              |
| Connection Name | The default name is <b>CloudTable-ClickHouse4 random characters</b> (including letters and numbers). You can also customize a name. |

| Parameter                          | Configuration                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MgC Agent                          | Select the <b>MgC Agent installed in the source environment</b> .                                                                                                                                                                                                                                                                                                      |
| CloudTable (ClickHouse) Credential | Select the credential of the CloudTable (ClickHouse) cluster. For details about how to add credentials, see "Big data - ClickHouse" in <b>Adding Resource Credentials</b> . When you add the credential, select <b>Username/Password</b> for <b>Authentication</b> and enter the username and password for logging in to the ClickHouse cluster created on CloudTable. |
| Database URL                       | Enter the URL to access the CloudTable (ClickHouse) database. You can obtain the access address from the <b>basic information of the ClickHouse cluster</b> .                                                                                                                                                                                                          |

**Table 1-86** Parameters required for creating a connection to CloudTable (HBase)

| Parameter                     | Configuration                                                                                                                                                                                                             |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To                 | Select <b>Target</b> .                                                                                                                                                                                                    |
| Connection Name               | The default name is <b>CloudTable-HBase4 random characters</b> (including letters and numbers). You can also customize a name.                                                                                            |
| MgC Agent                     | Select the <b>MgC Agent installed in the source environment</b> .                                                                                                                                                         |
| CloudTable (HBase) Credential | No credential is required for unsecured clusters.                                                                                                                                                                         |
| Secured Cluster               | Currently, only unsecured clusters (common clusters) are supported.                                                                                                                                                       |
| Database URL                  | Enter the URL to access the CloudTable (HBase) database. You can obtain the access address from the <b>basic information</b> of the HBase cluster. The address displayed after <b>ZK Link (Intranet)</b> is one you need. |

**Step 7** Click **Test**. MgC verifies whether the cloud service can be connected using the configuration information. If the test is successful, the cloud services can be connected.

**Step 8** After the connection test is successful, click **Confirm**. The cloud service connection is created.

**Step 9** On the **Connection Management** page, view the created connection and its basic information. In the **Operation** column, click **Modify** to modify the connection settings.

----End

### 1.12.5.3 Creating a Connection to a Target Component

To verify the consistency of data stored using big data components, you need to establish connections between MgC and the big data components.

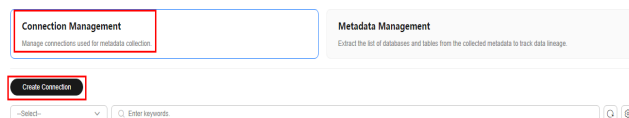
The supported big data components include:

- Doris
- HBase
- ClickHouse
- Hive Metastore

#### Procedure

- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select a **big data migration project** from the drop-down list.
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**.
- Step 3** In the **Features** area, click **Preparations**.
- Step 4** Choose **Connection Management** and click **Create Connection**.

**Figure 1-63** Creating a connection



- Step 5** Select a big data component and click **Next**.
- Step 6** Set parameters based on the big data component you selected.
  - [Parameters for creating a connection to Doris](#)
  - [Parameters for creating a connection to HBase](#)
  - [Parameters for creating a connection to ClickHouse](#)
  - [Parameters for creating a connection to Hive Metastore](#)

**Table 1-87** Parameters for creating a connection to Doris

| Parameter        | Configuration                                                                                                                                                                                           |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To    | Select <b>Target</b> .                                                                                                                                                                                  |
| Connection Name  | The default name is <b>Doris-4 random characters</b> (including letters and numbers). You can also customize a name.                                                                                    |
| MgC Agent        | Select the <a href="#">MgC Agent installed in the source environment</a> .                                                                                                                              |
| Doris Credential | Select the credential added to the MgC Agent for accessing your target Doris cluster. For details about how to add credentials, see "Big data - Doris" in <a href="#">Adding Resource Credentials</a> . |



| Parameter             | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Database IP Address   | Enter the IP address for accessing the target Doris cluster.<br>To obtain the address, log in to <a href="#">FusionInsight Manager</a> , choose <b>Cluster &gt; Services &gt; Doris</b> , and check <b>Host Where Leader Locates</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Database Port         | Enter the port for accessing the target Doris cluster.<br>To obtain the port, log in to <a href="#">FusionInsight Manager</a> , choose <b>Cluster &gt; Services &gt; Doris &gt; Configurations</b> , and search for <b>query_port</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Database Name         | Enter the name of the target Doris database.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Collect Usage Metrics | <p>This parameter is optional. If this option is enabled, usage metrics for your big data resources will be collected during the execution of tasks created using this connection. The collected information is used to generate reports on the MgC console and for performance optimization.</p> <p><b>NOTICE</b></p> <p>Before using this function, ensure that the Huawei Cloud account you added to the MgC Agent has the read-only permission for MRS and DLI.</p> <ul style="list-style-type: none"><li>• If the selected credential is the one you currently use to access MgC, you can select <b>This is my MgC credential</b>, and the projects in the region you choose will be listed.<ul style="list-style-type: none"><li>– Under <b>Region</b>, select the region where the data to be verified is located.</li><li>– Under <b>Project</b>, select the project where the data to be verified is stored.</li><li>– Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li></ul></li><li>• If the selected Doris credential is not the one you currently use to access MgC:<ul style="list-style-type: none"><li>– Under <b>Region ID</b>, enter the ID of the region where the data to be verified is located. For example, if the region is CN South-Guangzhou, enter <b>cn-south-1</b>.</li><li>– Under <b>Project ID</b>, enter the project ID corresponding to the region.</li><li>– Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li></ul></li></ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"><li>• To view the region ID and project ID, choose <b>My Credentials &gt; API Credentials</b>.</li><li>• For details about how to obtain the cluster ID, see <a href="#">Obtaining an MRS Cluster ID</a>.</li></ul> |

**Table 1-88** Parameters for creating a connection to HBase

| Parameter            | Configuration                                                                                                                                                                                       |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection To        | Select <b>Target</b> .                                                                                                                                                                              |
| Connection Name      | The default name is <b>HBase-4 random characters</b> (including letters and numbers). You can also customize a name.                                                                                |
| MgC Agent            | Select the <b>MgC Agent installed in the source environment</b> .                                                                                                                                   |
| HBase Credential     | Select the credential added to the MgC Agent for accessing your target HBase cluster. For details about how to add credentials, see <b>Big data - HBase</b> in <b>Adding Resource Credentials</b> . |
| Secured Cluster      | Choose whether the cluster is secured.                                                                                                                                                              |
| ZooKeeper IP Address | Enter the IP address for connecting to the target ZooKeeper node. You can enter the public or private IP address of the ZooKeeper server.                                                           |
| ZooKeeper Port       | Enter the port number for connecting to the target ZooKeeper node. The default value is <b>2181</b> .                                                                                               |
| HBase Version        | Select the HBase version used by the target cluster.                                                                                                                                                |

| Parameter             | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collect Usage Metrics | <p>This parameter is optional. If this option is enabled, usage metrics for your big data resources will be collected during the execution of tasks created using this connection. The collected information is used to generate reports on the MgC console and for performance optimization.</p> <p><b>NOTICE</b><br/>Before using this function, ensure that the Huawei Cloud account you added to the MgC Agent has the read-only permission for MRS and DLI.</p> <ul style="list-style-type: none"> <li>• If the selected credential is the one you currently use to access MgC, you can select <b>This is my MgC credential</b>, and the projects in the region you choose will be listed. <ul style="list-style-type: none"> <li>– Under <b>Region</b>, select the region where the data to be verified is located.</li> <li>– Under <b>Project</b>, select the project where the data to be verified is stored.</li> <li>– Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> <li>• If the selected Doris credential is not the one you currently use to access MgC: <ul style="list-style-type: none"> <li>– Under <b>Region ID</b>, enter the ID of the region where the data to be verified is located. For example, if the region is CN South-Guangzhou, enter <b>cn-south-1</b>.</li> <li>– Under <b>Project ID</b>, enter the project ID corresponding to the region.</li> <li>– Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• To view the region ID and project ID, choose <b>My Credentials &gt; API Credentials</b>.</li> <li>• For details about how to obtain the cluster ID, see <a href="#">Obtaining an MRS Cluster ID</a>.</li> </ul> |

**Table 1-89** Parameters for creating a connection to ClickHouse

| Parameter       | Configuration                                                                                                             |
|-----------------|---------------------------------------------------------------------------------------------------------------------------|
| Connection To   | Select <b>Target</b> .                                                                                                    |
| Connection Name | The default name is <b>ClickHouse-4 random characters</b> (including letters and numbers). You can also customize a name. |
| MgC Agent       | Select the <b>MgC Agent installed in the source environment</b> .                                                         |

| Parameter                        | Configuration                                                                                                                                                                                                     |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ClickHouse Credential (Optional) | Select the credential added to the MgC Agent for accessing your target ClickHouse cluster. For details about how to add credentials, see "Big data - ClickHouse" in <a href="#">Adding Resource Credentials</a> . |
| Secured Cluster                  | Choose whether the cluster is secured.                                                                                                                                                                            |
| ClickHouse Server IP Address     | Enter the IP address of the target ClickHouse server.                                                                                                                                                             |
| HTTP Port                        | If the ClickHouse cluster is unsecured, enter the HTTP port for communicating with the target ClickHouse server. The default value is 8123.                                                                       |
| HTTP SSL/TLS Port                | If the ClickHouse cluster is secured, enter the HTTPS port for communicating with the target ClickHouse server.                                                                                                   |

| Parameter             | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collect Usage Metrics | <p>This parameter is optional. If this option is enabled, usage metrics for your big data resources will be collected during the execution of tasks created using this connection. The collected information is used to generate reports on the MgC console and for performance optimization.</p> <p><b>NOTICE</b><br/>Before using this function, ensure that the Huawei Cloud account you added to the MgC Agent has the read-only permission for MRS and DLI.</p> <ul style="list-style-type: none"> <li>• If the selected credential is the one you currently use to access MgC, you can select <b>This is my MgC credential</b>, and the projects in the region you choose will be listed. <ul style="list-style-type: none"> <li>– Under <b>Region</b>, select the region where the data to be verified is located.</li> <li>– Under <b>Project</b>, select the project where the data to be verified is stored.</li> <li>– Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> <li>• If the selected Doris credential is not the one you currently use to access MgC: <ul style="list-style-type: none"> <li>– Under <b>Region ID</b>, enter the ID of the region where the data to be verified is located. For example, if the region is CN South-Guangzhou, enter <b>cn-south-1</b>.</li> <li>– Under <b>Project ID</b>, enter the project ID corresponding to the region.</li> <li>– Under <b>Cluster ID</b>, enter the ID of the cluster where the data to be verified is located.</li> </ul> </li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• To view the region ID and project ID, choose <b>My Credentials &gt; API Credentials</b>.</li> <li>• For details about how to obtain the cluster ID, see <a href="#">Obtaining an MRS Cluster ID</a>.</li> </ul> |

**Table 1-90** Parameters for creating a connection to Hive Metastore

| Parameter       | Configuration                                                                                                                 |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------|
| Connection To   | Select <b>Target</b> .                                                                                                        |
| Connection Name | The default name is <b>Hive-Metastore-4 random characters</b> (including letters and numbers). You can also customize a name. |
| MgC Agent       | Select the <b>MgC Agent installed in the source environment</b> .                                                             |

| Parameter                  | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Secure Connection          | Choose whether to enable secure connection. <ul style="list-style-type: none"><li>• If Hive Metastore is deployed in an unsecured cluster, do not enable secure connection.</li><li>• If Hive Metastore is deployed in a secured cluster, enable secure connection and provide access credentials. For details about how to obtain and add credentials to MgC, see "Big data - Hive Metastore" in <a href="#">Adding Resource Credentials</a>.</li></ul> |
| Hive Version               | Select the target Hive version.<br><b>CAUTION</b><br>Only version 3.x is available.                                                                                                                                                                                                                                                                                                                                                                      |
| Hive Metastore IP Address  | Enter the IP address for connecting to the Hive Metastore node.                                                                                                                                                                                                                                                                                                                                                                                          |
| Hive Metastore Thrift Port | Enter the port for connecting to the Hive Metastore Thrift service. The default port is 9083.                                                                                                                                                                                                                                                                                                                                                            |

| Parameter                    | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connect to Metadata Database | <p>During an incremental data verification, querying with Hive Metastore on more than 30,000 partitions may lead to a memory overflow (OOM) since all partition information is loaded into memory. Connecting to the MySQL metadata database can effectively prevent this issue.</p> <ul style="list-style-type: none"> <li>• If you disable this option, the system queries the information of Hive tables and partitions using Hive Metastore.</li> <li>• If you enable this option, configure the MySQL database information. The system will query the information of Hive tables and partitions through the MySQL database. You need to set the following parameters: <ul style="list-style-type: none"> <li>- <b>Metadata Database Type:</b> Only MySQL is supported.</li> <li>- <b>MySQL Credential:</b> Select the credential for accessing the MySQL database. You need to add the credential to the MgC Agent and synchronize it to MgC. For details, see <a href="#">Adding Resource Credentials</a>.</li> <li>- <b>MySQL Node IP Address:</b> Enter the IP address of the MySQL database server.</li> <li>- <b>MySQL Port:</b> Enter the port of the MySQL database service.</li> <li>- <b>Database Name:</b> Enter the name of the database that stores the Hive table metadata.</li> </ul> </li> </ul> <p><b>NOTE</b><br/>Ensure that the entered MySQL credential, node IP address, service port, and database name match the MySQL database used by Hive. Otherwise, data verification will fail.</p> |

**Step 7** Click **Test**. MgC verifies whether the component can be connected using the configuration information. If the test is successful, the cloud services can be connected.

**Step 8** After the connection test is successful, click **Confirm**. The connection is created.

**Step 9** On the **Connection Management** page, view the created connection and its basic information. In the **Operation** column, click **Modify** to modify the connection settings.

----End

## 1.12.6 Creating and Executing Verification Tasks

You can use the created source and target connections to create verification tasks.

For details about the supported big data components and verification methods, see [Overview](#).

## Precautions

- A pair of verification tasks for the source and the target must use the same verification method.
- If the source and target HBase clusters use different security authentication modes, the verification tasks cannot be executed at the same time, or they will fail to be executed. This is because the authentication information must be handled differently in each cluster. The secured cluster requires authentication information to be loaded, whereas the non-secured cluster needs that information cleared.
- If the source Lindorm or HBase service is locked due to arrears, you can still create data connections and verification tasks, but data access and operations will be restricted, preventing verification tasks from being executed. Before starting data verification, ensure that the source big data service is active and your account balance is sufficient. If the service is locked, promptly pay the fee to unlock it. Once the service is unlocked, you can execute the data verification tasks again.
- The verification results of data migrated between Hive 2.x and Hive 3.x may be inaccurate. In Hive 2.x, when you query the fixed-length type CHAR (N) of data, if the actual data length does not meet the specified length N, Hive will pad the string with spaces to reach the required length. However, in Hive 3.x, this padding operation does not occur during queries. This may result in differences between different versions. To avoid this issue, you are advised to use Beeline to perform the verification.
- When you YARN to run data verification at the source and target MRS clusters, execute the verification tasks separately. Ensure that one task is completed before starting another.
- When you verify data consistency for clusters of MRS 3.3.0 or later, do not use cluster nodes as executors, or the verification will fail.

## Notes and Constraints

- Before verifying data migrated from EMR Delta Lake to MRS Delta Lake, please note:
  - If the source EMR cluster uses Spark 3.3.1, data verification is supported regardless of whether the source cluster contains metadata storage.
  - If the source EMR cluster uses Spark 2.4.8, data verification is supported only when the source cluster contains metadata storage.
- Verification is not available for HBase tables that only store cold data.
- A verification task must be completed within one day. If the task extends past midnight (00:00), the verification results may be inaccurate. Plan verification tasks carefully to avoid execution across days.
- Field verification is not supported if the source Alibaba Cloud cluster uses ClickHouse 21.8.15.7 and the target Huawei Cloud cluster uses ClickHouse 23.3.2.37. This is because the two versions process IPv4 and IPv6 data types and function calculation results differently.



- During the daily incremental verification, hourly incremental verification, and date-based verification for Hive, partitions with a Date-type partition field that does not follow the standard YYYY-MM-DD format cannot be verified.
- MgC cannot verify the consistency of data migrated between secured HBase 2.x clusters. The accuracy of verification is impacted by version compatibility restrictions, differences in security authentication mechanisms, protocol and interface inconsistencies, as well as variations in feature support and configuration between different versions.

## Prerequisites

- A table group has been created, and tables to be verified have been added to the group. For details, see [Creating a Table Group and Adding Tables to the Group](#).
- Connections to the source and the target have been created. For details, see [Creating Connections](#)

## Procedure

- Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select a **big data migration project** from the drop-down list.
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**.
- Step 3** In the **Features** area, click **Task Management**.
- Step 4** Click **Create Task** in the upper right corner of the page.
- Step 5** Select a big data component and verification method as needed and click **Next**.
- Step 6** Configure task parameters based on the selected big data component and verification method.

### NOTE

The task parameters vary with the big data component.

- [Parameters for creating a full verification task](#)
- [Parameters for creating a daily incremental verification task](#)
- [Parameters for creating an hourly incremental verification task](#)
- [Parameters for creating a date-based verification task](#)
- [Parameters for creating a selective verification task](#)

**Table 1-91** Parameters for creating a full verification task

| Area          | Parameter    | Configuration                                                                                                                              |
|---------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Basic Info    | Task Name    | The default name is <i>Component-full-verification-4 random characters</i> (including letters and numbers). You can also customize a name. |
| Task Settings | Table Groups | Select the table groups that contain the tables to be verified.                                                                            |

| Area | Parameter                      | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Executor Connection            | <p>This parameter is available for Hive, Delta Lake, and Hudi.</p> <ul style="list-style-type: none"> <li>To create a verification task for the source, select the source executor connection.</li> <li>To create a verification task for the target, select the target executor connection.</li> </ul>                                                                                                                                     |
|      | DLI Connection                 | <p>If DLI is selected in the previous step, the task can only be created for the target. You need to select the <b>created DLI connection</b>.</p>                                                                                                                                                                                                                                                                                          |
|      | Doris Connection               | <p>If Doris is selected in the previous step:</p> <ul style="list-style-type: none"> <li>To create a verification task for the source, select the source Doris connection.</li> <li>To create a verification task for the target, select the target Doris connection.</li> </ul>                                                                                                                                                            |
|      | HBase Connection               | <p>This parameter is available for HBase and CloudTable (HBase).</p> <ul style="list-style-type: none"> <li>To create a verification task for the source, select the source HBase connection.</li> <li>To create a verification task for the target, select the target HBase or CloudTable (HBase) connection.</li> </ul>                                                                                                                   |
|      | ClickHouse Connection          | <p>This parameter is available for ClickHouse, Alibaba Cloud ApsaraDB for ClickHouse, and CloudTable (ClickHouse).</p> <ul style="list-style-type: none"> <li>To create a verification task for the source, select the source MRS ClickHouse or Alibaba Cloud ApsaraDB for ClickHouse connection.</li> <li>To create a verification task for the target, select the target MRS ClickHouse or CloudTable (ClickHouse) connection.</li> </ul> |
|      | Metadata Connection (Optional) | <p>This parameter is available for Delta Lake.</p> <p>To improve processing efficiency, you can select metadata connections to the source Delta Lake cluster where the groups of tables to be verified belong to.</p>                                                                                                                                                                                                                       |
|      | Execution Time                 | <p>Specify when the task will be executed. After the task is activated, it will be automatically executed at the specified time every day.</p> <p><b>NOTE</b><br/>You are advised to run the verification during off-peak hours.</p>                                                                                                                                                                                                        |

| Area | Parameter        | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Advanced Options | <ul style="list-style-type: none"> <li> <b>Concurrency:</b> Specify the number of concurrent threads on an executor for the verification task. The default value is <b>3</b>. The value ranges from <b>1</b> to <b>10</b>.                     </li> </ul> <p><b>CAUTION</b></p> <p>If you are creating a verification task for an Alibaba Cloud EMR Hive cluster, set this parameter based on the source data volume and master node specifications. Consider the following rules:</p> <ul style="list-style-type: none"> <li>The total number of concurrent threads for verification tasks running simultaneously in the source cluster cannot exceed 70% of the total number of cores on the metadata node.</li> <li>The total resources allocated to verification tasks cannot exceed the resources of the execution queue. The total resources allocated to tasks can be calculated as follows:<br/>                     Allocated memory = Number of executors × Memory on an executor × Concurrency<br/>                     Allocated cores = Number of executors × Cores on an executor × Concurrency</li> </ul> <p>Assume that the total source data volume is 500 GB spread across 10,000 tables, in which there are 8 large tables with 50 GB data and 100,000 partitions. The master node has 8 vCPUs and 32 GB of memory.</p> <ul style="list-style-type: none"> <li>According to rule 1, the maximum number of concurrent requests is 5, which is the rounded down value of 5.6 (<math>0.7 \times 8</math>).</li> <li>According to rule 2, you need to select <b>spark-sql</b> in the <b>Execution Command</b> area and set the following parameters:</li> </ul> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p>Execution Command</p> <p>baseline   hive   <b>spark-sql</b></p> <p>executor-memory 4G</p> <p>master yarn</p> <p>num-executors 20</p> <p>executor-cores 2</p> <p>driver-memory 10G <span style="float: right;">Add</span></p> <p><small>Script Preview</small></p> <p><small>spark-sql --executor-memory 4G --master yarn --num-executors 20 --executor-cores 2 --driver-memory 10G -f</small></p> </div> <p>executor-memory = 4G<br/>                     master = yarn<br/>                     num-executors = 20<br/>                     executor-cores = 2<br/>                     driver-memory = 10G</p> <li> <b>Max. SQL Statements Per File:</b> Each time the task is executed, files are created for storing the SQL statements generated for querying tables. You can control how many SQL statements can be stored in a single file. The default value is <b>10</b>. The recommended value ranges from <b>1</b> to <b>50</b>.                     </li> |

| Area             | Parameter                          | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  |                                    | <ul style="list-style-type: none"> <li>• <b>Timeout (s):</b> indicates the maximum time allowed for an SQL statement to end normally. The unit is second (s). The default value is <b>600</b>. The value ranges from <b>600</b> to <b>7,200</b>.</li> <li>• <b>Send SMN Notifications:</b> Determine whether to use SMN to notify you of the task status in a timely manner through emails, SMS messages, or customized URLs.</li> </ul> <p><b>NOTICE</b></p> <ul style="list-style-type: none"> <li>- Before enabling this function, you need to create a topic on the SMN console. For details, see <a href="#">Creating a Topic</a>.</li> <li>- Using this function may incur a small amount of fees, which are billed by SMN. For details, see <a href="#">SMN Billing</a>.</li> </ul> |
| Data Filtering   | Non-partitioned Table Verification | <p>Decide how to verify non-partitioned tables.</p> <ul style="list-style-type: none"> <li>• <b>Verify all:</b> All non-partitioned tables are verified as consistent.</li> <li>• <b>Skip all:</b> All non-partitioned tables are skipped during consistency verification.</li> <li>• <b>Filter by update time:</b> Only non-partitioned tables whose update time falls within the specified time range are verified as consistent. The update time of a non-partitioned table may not be accurate if it contains non-inserted data, and it may be excluded from verification.</li> </ul>                                                                                                                                                                                                  |
|                  | Advanced Options                   | <p><b>Max. Fields per SQL Statement:</b> Limit how many fields can be queried by one SQL statement. Too many or few fields in a SQL statement results in low query efficiency. The default value <b>0</b> means no limit is set. The value ranges from <b>100</b> to <b>500</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| OBS Bucket Check | -                                  | <ul style="list-style-type: none"> <li>• If you need to upload task logs and content verification results to an OBS bucket for management and analysis, <a href="#">configure an OBS bucket</a>. After the bucket is configured, the task logs and content verification results will be automatically uploaded to the specified OBS bucket.</li> <li>• If you do not need to upload the task logs and content verification results to OBS, select <b>I confirm that I only need to view logs and data verification results on the MgC Agent and do not need to upload them to OBS</b>.</li> </ul>                                                                                                                                                                                          |

| Area                                                                   | Parameter               | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Command Parameters<br>(This parameter is only available for Hive.)     | Security Authentication | <p>If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the <b>.keytab</b> file that contains the authentication key to the executor.</p> <ul style="list-style-type: none"> <li>• <b>Keytab Path:</b> Enter the path where the <b>.keytab</b> file is stored on the executor.</li> <li>• <b>Keytab Principal:</b> Enter the principal of the <b>.keytab</b> file.</li> </ul> |
|                                                                        | Execution Command       | <p>You can configure Beeline or Spark SQL command parameters to run SQL statements for verifying data consistency.</p> <ul style="list-style-type: none"> <li>• <b>Beeline:</b> a command line tool used to interact with Hive.</li> <li>• <b>Spark SQL:</b> used to execute SQL statements to query and analyze data.</li> </ul>                                                                                                                                                                                                    |
| MaxCompute Parameters<br>(This item is only available for MaxCompute.) | -                       | Add MaxCompute parameters as needed. For details about the parameters, see <a href="#">MaxCompute Documentation</a> .                                                                                                                                                                                                                                                                                                                                                                                                                |
| Execution Settings<br>(This item is only available for DLI.)           | Parameter               | Set the parameters as required. For details about the supported custom parameters, see <a href="#">Custom Parameters</a> .                                                                                                                                                                                                                                                                                                                                                                                                           |
| Execution Settings<br>(This item is only available for HBase.)         | Run Mode                | <p>The supported run modes include:</p> <p><b>Yarn:</b> This mode applies to large-scale distributed environments. It can make full use of cluster resources and improve task concurrency and efficiency.</p> <p><b>Local:</b> This mode applies to small-scale datasets or development and test environments for quick debugging and verification.</p>                                                                                                                                                                              |
|                                                                        | Parameters              | Add command parameters based on the selected run mode and requirements.                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Area                                                                         | Parameter                                                               | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Command Parameters<br>(This item is only available for Delta Lake and Hudi.) | Security Authentication (only available for target Delta Lake clusters) | If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the <b>.keytab</b> file that contains the authentication key to the executor. <ul style="list-style-type: none"> <li>● <b>Keytab Path:</b> Enter the path where the <b>.keytab</b> file is stored on the executor.</li> <li>● <b>Keytab Principal:</b> Enter the principal of the <b>.keytab</b> file.</li> </ul> |
|                                                                              | spark-sql                                                               | Spark SQL is a module used in Spark for structured data processing. In Spark applications, you can seamlessly use SQL statements or DataSet APIs to query structured data. For more information, see <a href="#">SparkSQL Principles</a> . Retain the default settings.                                                                                                                                                                                                                                                       |

| Area | Parameter    | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | spark-submit | <p>This is a basic Spark shell command used to submit Spark applications. The command is as follows:</p> <pre>./bin/spark-submit \<br/>--class &lt;main-class&gt; \<br/>--master &lt;master-url&gt; \<br/>... # other options \<br/>&lt;application-jar&gt; \<br/>[application-arguments]</pre> <p>Parameter description:</p> <ul style="list-style-type: none"> <li>● <b>--class</b>: indicates the name of the class of a Spark application.</li> <li>● <b>--master</b>: indicates the master to which the Spark application links, such as Yarn-client and Yarn-cluster.</li> <li>● <b>application-jar</b>: indicates the path of the JAR file of the Spark application.</li> <li>● <b>application-arguments</b>: indicates the parameter required to submit the Spark application. (This parameter can be empty.)</li> </ul> <p>The parameters that need to be added depend on the scenario:</p> <ul style="list-style-type: none"> <li>● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake cluster that uses Spark 3, add the following parameters: <ul style="list-style-type: none"> <li>- Parameter: <b>jars</b></li> <li>- Value: <b>'/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-core_2.12-*.jar,/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-storage-*.jar'</b></li> </ul> <p><b>CAUTION</b><br/>Replace the parameter values with the actual environment directory and Delta Lake version.</p> </li> <li>● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake 2.1.0 cluster that uses Spark 2.4.8, add the following parameter: <ul style="list-style-type: none"> <li>- Parameter: <b>mgc.delta.spark.version</b></li> <li>- Value: <b>2</b></li> </ul> </li> </ul> |

**Table 1-92** Parameters for creating a daily incremental verification task

| Area          | Parameter                      | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic Info    | Task Name                      | The default name is <i>Component-daily-incremental-verification-4 random characters</i> (including letters and numbers). You can also customize a name.                                                                                                                                                                                                                                                                                                                           |
| Task Settings | Table Groups                   | Select the table groups that contain the tables to be verified.                                                                                                                                                                                                                                                                                                                                                                                                                   |
|               | Executor Connection            | This parameter is available for Hive, Delta Lake, and Hudi. <ul style="list-style-type: none"> <li>To create a verification task for the source, select the source executor connection.</li> <li>To create a verification task for the target, select the target executor connection.</li> </ul>                                                                                                                                                                                  |
|               | DLI Connection                 | If DLI is selected in the previous step, the task can only be created for the target. You need to select the <b>created DLI connection</b> .                                                                                                                                                                                                                                                                                                                                      |
|               | Doris Connection               | If Doris is selected in the previous step: <ul style="list-style-type: none"> <li>To create a verification task for the source, select the source Doris connection.</li> <li>To create a verification task for the target, select the target Doris connection.</li> </ul>                                                                                                                                                                                                         |
|               | HBase Connection               | If HBase is selected in the previous step: <ul style="list-style-type: none"> <li>To create a verification task for the source, select the source HBase connection.</li> <li>To create a verification task for the target, select the target HBase or CloudTable (HBase) connection.</li> </ul>                                                                                                                                                                                   |
|               | (Optional) Metadata Connection | This parameter is available for Hive and Delta Lake.<br>If you are creating a verification task for the target Hive cluster, select the metadata connection to this Hive cluster. The connection is used to check whether the partitions to be verified can be found in the target cluster.<br>If you are creating a verification task for the source Delta Lake cluster, to improve processing efficiency, you can select metadata connections to the source Delta Lake cluster. |
|               | Execution Time                 | Specify when the task will be executed. After the task is activated, it will be automatically executed at the specified time every day.                                                                                                                                                                                                                                                                                                                                           |



| Area | Parameter        | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Advanced Options | <ul style="list-style-type: none"> <li> <b>Concurrency:</b> Specify the number of concurrent threads on an executor for the verification task. The default value is <b>3</b>. The value ranges from <b>1</b> to <b>10</b>.                     </li> </ul> <p><b>CAUTION</b></p> <p>If you are creating a verification task for an Alibaba Cloud EMR Hive cluster, set this parameter based on the source data volume and master node specifications. Consider the following rules:</p> <ul style="list-style-type: none"> <li>The total number of concurrent threads for verification tasks running simultaneously in the source cluster cannot exceed 70% of the total number of cores on the metadata node.</li> <li>The total resources allocated to verification tasks cannot exceed the resources of the execution queue. The total resources allocated to tasks can be calculated as follows:<br/>                     Allocated memory = Number of executors × Memory on an executor × Concurrency<br/>                     Allocated cores = Number of executors × Cores on an executor × Concurrency</li> </ul> <p>Assume that the total source data volume is 500 GB spread across 10,000 tables, in which there are 8 large tables with 50 GB data and 100,000 partitions. The master node has 8 vCPUs and 32 GB of memory.</p> <ul style="list-style-type: none"> <li>According to rule 1, the maximum number of concurrent requests is 5, which is the rounded down value of 5.6 (<math>0.7 \times 8</math>).</li> <li>According to rule 2, you need to select <b>spark-sql</b> in the <b>Execution Command</b> area and set the following parameters:</li> </ul> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p>Execution Command</p> <p>baseline hive <b>spark-sql</b></p> <p>executor-memory 4G</p> <p>master yarn</p> <p>num-executors 20</p> <p>executor-cores 2</p> <p>driver-memory 10G <span style="float: right;">Add</span></p> <p>Script Preview</p> <pre>spark-sql --executor-memory 4G --master yarn --num-executors 20 --executor-cores 2 --driver-memory 10G -f</pre> </div> <p>executor-memory = 4G<br/>                     master = yarn<br/>                     num-executors = 20<br/>                     executor-cores = 2<br/>                     driver-memory = 10G</p> <li> <b>Max. SQL Statements Per File:</b> Each time the task is executed, files are created for storing the SQL statements generated for querying tables. You can control how many SQL statements can be stored in a single file. The default value is <b>10</b>. The recommended value ranges from <b>1</b> to <b>50</b>.                     </li> |

| Area           | Parameter                          | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                |                                    | <ul style="list-style-type: none"> <li>• <b>Timeout (s)</b>: indicates the maximum time allowed for an SQL statement to end normally. The unit is second (s). The default value is <b>600</b>. The value ranges from <b>600</b> to <b>7,200</b>.</li> <li>• <b>Send SMN Notifications</b>: Determine whether to use SMN to notify you of the task status in a timely manner through emails, SMS messages, or customized URLs.</li> </ul> <p><b>NOTICE</b></p> <ul style="list-style-type: none"> <li>- Before enabling this function, you need to create a topic on the SMN console. For details, see <a href="#">Creating a Topic</a>.</li> <li>- Using this function may incur a small amount of fees, which are billed by SMN. For details, see <a href="#">SMN Billing</a>.</li> </ul> |
| Data Filtering | Incremental Scope                  | <p>Select the time period in which the incremental data needs to be verified as consistent. By default, a 24-hour period is selected. <b>T</b> indicates the execution time of the task, and <b>T-n</b> indicates a time <math>n \times 24</math> hours before the execution time.</p> <p>If you select <b>Consecutive days</b>, the system verifies consistency of the incremental data generated during these consecutive days.</p>                                                                                                                                                                                                                                                                                                                                                      |
|                | Non-partitioned Table Verification | <p>Decide how to verify non-partitioned tables.</p> <ul style="list-style-type: none"> <li>• <b>Verify all</b>: All non-partition tables are verified.</li> <li>• <b>Skip all</b>: All non-partitioned tables are skipped during consistency verification.</li> <li>• <b>Filter by update time</b>: Only non-partitioned tables whose update time falls within the specified time range are verified as consistent. The update time of a non-partitioned table may not be accurate if it contains non-inserted data, and it may be excluded from verification.</li> </ul>                                                                                                                                                                                                                  |

| Area             | Parameter        | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | Advanced Options | <ul style="list-style-type: none"> <li>● <b>Partition Filtering:</b> Determine to filter table partitions by creation time or update time.               <ul style="list-style-type: none"> <li>- <b>By update time:</b> An update time indicates the timestamp a table partition was last modified or updated. Choose this option if you are concerned about the latest status or changes of data in a partition.</li> <li>- <b>By creation time:</b> A creation time indicates the timestamp when a partition was created. Choose this option if you are concerned about the data generated from the time when the partition is created to a certain time point.</li> </ul> </li> <li>● <b>Max. Partitions:</b> Limit how many partitions in a table are verified. The default value is <b>3</b>. The value ranges from <b>1</b> to <b>50</b>. For example, if this parameter is set to <b>3</b>, the system verifies the consistency of only the first three partitions that are sorted by ID in descending order.</li> <li>● <b>Max. Fields per SQL Statement:</b> Limit how many fields can be queried by one SQL statement. Too many or few fields in a SQL statement results in low query efficiency. The default value <b>0</b> means no limit is set. The value ranges from <b>100</b> to <b>500</b>.</li> </ul> |
| OBS Bucket Check | -                | <ul style="list-style-type: none"> <li>● If you need to upload task logs and content verification results to an OBS bucket for management and analysis, <a href="#">configure an OBS bucket</a>. After the bucket is configured, the task logs and content verification results will be automatically uploaded to the specified OBS bucket.</li> <li>● If you do not need to upload the task logs and content verification results to OBS, select <b>I confirm that I only need to view logs and data verification results on the MgC Agent and do not need to upload them to OBS.</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Area                                                             | Parameter               | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Execution Script<br>(This parameter is only available for Hive.) | Security Authentication | <p>If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the <b>.keytab</b> file that contains the authentication key to the executor.</p> <ul style="list-style-type: none"> <li>• <b>Keytab Path:</b> Enter the path where the <b>.keytab</b> file is stored on the executor.</li> <li>• <b>Keytab Principal:</b> Enter the principal of the <b>.keytab</b> file.</li> </ul> |
|                                                                  | Execution Command       | <p>You can configure Beeline or Spark SQL command parameters to run SQL statements for verifying data consistency.</p> <ul style="list-style-type: none"> <li>• <b>Beeline:</b> a command line tool used to interact with Hive.</li> <li>• <b>Spark SQL:</b> a command line tool used to execute SQL statements to query and analyze Hive data.</li> </ul>                                                                                                                                                                           |
| MaxCompute Parameters<br>(MaxCompute)                            | -                       | Add MaxCompute parameters as needed. For details about the parameters, see <a href="#">MaxCompute Documentation</a> .                                                                                                                                                                                                                                                                                                                                                                                                                |
| Execution Settings<br>(This item is only available for DLI.)     | Parameter               | Set the parameters as required. For details about the supported custom parameters, see <a href="#">Custom Parameters</a> .                                                                                                                                                                                                                                                                                                                                                                                                           |
| Statistics Configuration<br>(HBase)                              | Run Mode                | <p>The supported run modes include:</p> <p><b>Yarn:</b> This mode applies to large-scale distributed environments. It can make full use of cluster resources and improve task concurrency and efficiency.</p> <p><b>Local:</b> This mode applies to small-scale datasets or testing and development environments. It enables rapid debugging and verification.</p>                                                                                                                                                                   |
|                                                                  | Parameter               | Add command parameters based on the selected run mode and requirements.                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Area                                                      | Parameter                                                               | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Command Parameters<br>(available for Delta Lake and Hudi) | Security Authentication (only available for target Delta Lake clusters) | If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the <b>.keytab</b> file that contains the authentication key to the executor. <ul style="list-style-type: none"> <li>• <b>Keytab Path:</b> Enter the path where the <b>.keytab</b> file is stored on the executor.</li> <li>• <b>Keytab Principal:</b> Enter the principal of the <b>.keytab</b> file.</li> </ul> |
|                                                           | spark-sql                                                               | Spark SQL is a module used in Spark for structured data processing. In Spark applications, you can seamlessly use SQL statements or DataSet APIs to query structured data. For more information, see <a href="#">SparkSQL Principles</a> . Retain the default settings.                                                                                                                                                                                                                                                       |

| Area | Parameter    | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | spark-submit | <p>This is a basic Spark shell command used to submit Spark applications. The command is as follows:</p> <pre>./bin/spark-submit \<br/>--class &lt;main-class&gt; \<br/>--master &lt;master-url&gt; \<br/>... # other options \<br/>&lt;application-jar&gt; \<br/>[application-arguments]</pre> <p>Parameter description:</p> <ul style="list-style-type: none"> <li>● <b>--class</b>: indicates the name of the class of a Spark application.</li> <li>● <b>--master</b>: indicates the master to which the Spark application links, such as Yarn-client and Yarn-cluster.</li> <li>● <b>application-jar</b>: indicates the path of the JAR file of the Spark application.</li> <li>● <b>application-arguments</b>: indicates the parameter required to submit the Spark application. (This parameter can be empty.)</li> </ul> <p>The parameters that need to be added depend on the scenario:</p> <ul style="list-style-type: none"> <li>● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake cluster that uses Spark 3, add the following parameters: <ul style="list-style-type: none"> <li>– Parameter: <b>jars</b></li> <li>– Value: <b>'/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-core_2.12-*.jar,/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-storage-*.jar'</b></li> </ul> <p><b>CAUTION</b><br/>Replace the parameter values with the actual environment directory and Delta Lake version.</p> </li> <li>● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake 2.1.0 cluster that uses Spark 2.4.8, add the following parameter: <ul style="list-style-type: none"> <li>– Parameter: <b>mgc.delta.spark.version</b></li> <li>– Value: <b>2</b></li> </ul> </li> </ul> |

**Table 1-93** Parameters for creating an hourly incremental verification task

| Area          | Parameter                      | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic Info    | Task Name                      | The default name is <i>Component-hourly incremental verification-4 random characters</i> (including letters and numbers). You can also customize a name.                                                                                                                                                                                                                                                                                                     |
| Task Settings | Table Groups                   | Select the table groups that contain the tables to be verified.                                                                                                                                                                                                                                                                                                                                                                                              |
|               | Executor Connection            | This parameter is available for Hive, Delta Lake, and Hudi. <ul style="list-style-type: none"> <li>To create a verification task for the source, select the source executor connection.</li> <li>To create a verification task for the target, select the target executor connection.</li> </ul>                                                                                                                                                             |
|               | DLI Connection                 | If DLI is selected in the previous step, the task can only be created for the target. You need to select the <b>created DLI connection</b> .                                                                                                                                                                                                                                                                                                                 |
|               | Doris Connection               | If Doris is selected in the previous step: <ul style="list-style-type: none"> <li>To create a verification task for the source, select the source Doris connection.</li> <li>To create a verification task for the target, select the target Doris connection.</li> </ul>                                                                                                                                                                                    |
|               | Metadata Connection (Optional) | This parameter is available for Hive and Delta Lake.<br>If you are creating a verification task for the target Hive cluster, select the metadata connection to this Hive cluster. The connections are used to check whether the partitions to be verified can be found in the target cluster.<br>To improve processing efficiency, you can select metadata connections to the source Delta Lake cluster where the groups of tables to be verified belong to. |
|               | Start Time                     | Specify when the task will be executed. After the task is activated, it will be automatically executed at the specified time.                                                                                                                                                                                                                                                                                                                                |

| Area | Parameter        | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Advanced Options | <ul style="list-style-type: none"> <li> <b>Concurrency:</b> Specify the number of concurrent threads on an executor for the verification task. The default value is <b>3</b>. The value ranges from <b>1</b> to <b>10</b>.                     </li> </ul> <p><b>CAUTION</b></p> <p>If you are creating a verification task for an Alibaba Cloud EMR Hive cluster, set this parameter based on the source data volume and master node specifications. Consider the following rules:</p> <ul style="list-style-type: none"> <li>- The total number of concurrent threads for verification tasks running simultaneously in the source cluster cannot exceed 70% of the total number of cores on the metadata node.</li> <li>- The total resources allocated to verification tasks cannot exceed the resources of the execution queue. The total resources allocated to tasks can be calculated as follows:<br/>                     Allocated memory = Number of executors × Memory on an executor × Concurrency<br/>                     Allocated cores = Number of executors × Cores on an executor × Concurrency</li> </ul> <p>Assume that the total source data volume is 500 GB spread across 10,000 tables, in which there are 8 large tables with 50 GB data and 100,000 partitions. The master node has 8 vCPUs and 32 GB of memory.</p> <ul style="list-style-type: none"> <li>- According to rule 1, the maximum number of concurrent requests is 5, which is the rounded down value of 5.6 (<math>0.7 \times 8</math>).</li> <li>- According to rule 2, you need to select <b>spark-sql</b> in the <b>Execution Command</b> area and set the following parameters:</li> </ul> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p>Execution Command</p> <p>baseline hive <b>spark-sql</b></p> <p>executor-memory 4G</p> <p>master yarn</p> <p>num-executors 20</p> <p>executor-cores 2</p> <p>driver-memory 10G <span style="float: right;">Add</span></p> </div> <pre>Script Preview spark-sql --executor-memory 4G --master yarn --num-executors 20 --executor-cores 2 --driver-memory 10G -f</pre> <p>executor-memory = 4G<br/>                     master = yarn<br/>                     num-executors = 20<br/>                     executor-cores = 2<br/>                     driver-memory = 10G</p> |



| Area           | Parameter                          | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                |                                    | <p>The unit is second (s). The default value is <b>600</b>. The value ranges from <b>600</b> to <b>7,200</b>.</p> <ul style="list-style-type: none"> <li>• <b>Send SMN Notifications:</b> Determine whether to use SMN to notify you of the task status in a timely manner through emails, SMS messages, or customized URLs.</li> </ul> <p><b>NOTICE</b></p> <ul style="list-style-type: none"> <li>- Before enabling this function, you need to create a topic on the SMN console. For details, see <a href="#">Creating a Topic</a>.</li> <li>- Using this function may incur a small amount of fees, which are billed by SMN. For details, see <a href="#">SMN Billing</a>.</li> </ul> |
| Data Filtering | Execution Interval                 | Control how frequent the task will be executed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                | Non-partitioned Table Verification | <p>Decide how to verify non-partitioned tables.</p> <ul style="list-style-type: none"> <li>• <b>Verify all:</b> All non-partitioned tables are verified as consistent.</li> <li>• <b>Skip all:</b> All non-partitioned tables are skipped during consistency verification.</li> <li>• <b>Filter by update time:</b> Only non-partitioned tables whose update time falls within the specified time range are verified as consistent. The update time of a non-partitioned table may not be accurate if it contains non-inserted data, and it may be excluded from verification.</li> </ul>                                                                                                 |

| Area             | Parameter        | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | Advanced Options | <ul style="list-style-type: none"> <li>● <b>Partition Filtering:</b> Determine to filter table partitions by creation time or update time.               <ul style="list-style-type: none"> <li>– <b>By update time:</b> An update time indicates the timestamp a table partition was last modified or updated. Choose this option if you are concerned about the latest status or changes of data in a partition.</li> <li>– <b>By creation time:</b> A creation time indicates the timestamp when a partition was created. Choose this option if you are concerned about the data generated from the time when the partition is created to a certain time point.</li> </ul> </li> <li>● <b>Max. Partitions:</b> Limit how many partitions in a table are verified. The default value is <b>3</b>. The value ranges from <b>1</b> to <b>50</b>.<br/>For example, if this parameter is set to <b>3</b>, the system verifies the consistency of only the first three partitions that are sorted by ID in descending order.</li> <li>● <b>Max. Fields per SQL Statement:</b> Limit how many fields can be queried by one SQL statement. Too many or few fields in a SQL statement results in low query efficiency. The default value <b>0</b> means no limit is set. The value ranges from <b>100</b> to <b>500</b>.</li> </ul> |
| OBS Bucket Check | -                | <ul style="list-style-type: none"> <li>● If you need to upload task logs and content verification results to an OBS bucket for management and analysis, <b>configure an OBS bucket</b>. After the bucket is configured, the task logs and content verification results will be automatically uploaded to the specified OBS bucket.</li> <li>● If you do not need to upload the task logs and content verification results to OBS, select <b>I confirm that I only need to view logs and data verification results on the MgC Agent and do not need to upload them to OBS</b>.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Area                                                             | Parameter                                                               | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Execution Script<br>(This parameter is only available for Hive.) | Security Authentication                                                 | If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the <b>.keytab</b> file that contains the authentication key to the executor. <ul style="list-style-type: none"> <li>• <b>Keytab Path:</b> Enter the path where the <b>.keytab</b> file is stored on the executor.</li> <li>• <b>Keytab Principal:</b> Enter the principal of the <b>.keytab</b> file.</li> </ul> |
|                                                                  | Execution Command                                                       | You can configure Beeline or Spark SQL command parameters to run SQL statements for consistency verification. <ul style="list-style-type: none"> <li>• <b>Beeline:</b> a command line tool used to interact with Hive.</li> <li>• <b>Spark SQL:</b> a command line tool used to execute SQL statements to query and analyze Hive data.</li> </ul>                                                                                                                                                                             |
| MaxCompute Parameters<br>(MaxCompute)                            | -                                                                       | Add MaxCompute parameters as needed. For details about the parameters, see <a href="#">MaxCompute Documentation</a> .                                                                                                                                                                                                                                                                                                                                                                                                         |
| Execution Settings<br>(This item is only available for DLI.)     | Parameter                                                               | Set the parameters as required. For details about the supported custom parameters, see <a href="#">Custom Parameters</a> .                                                                                                                                                                                                                                                                                                                                                                                                    |
| Command Parameters<br>(available for Delta Lake and Hudi)        | Security Authentication (only available for target Delta Lake clusters) | If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the <b>.keytab</b> file that contains the authentication key to the executor. <ul style="list-style-type: none"> <li>• <b>Keytab Path:</b> Enter the path where the <b>.keytab</b> file is stored on the executor.</li> <li>• <b>Keytab Principal:</b> Enter the principal of the <b>.keytab</b> file.</li> </ul> |

| Area | Parameter    | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | spark-sql    | <p>Spark SQL is a module used in Spark for structured data processing. In Spark applications, you can seamlessly use SQL statements or DataSet APIs to query structured data. For more information, see <a href="#">SparkSQL Principles</a>. Retain the default settings.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|      | spark-submit | <p>This is a basic Spark shell command used to submit Spark applications. The command is as follows:</p> <pre>./bin/spark-submit \<br/>--class &lt;main-class&gt; \<br/>--master &lt;master-url&gt; \<br/>... # other options \<br/>&lt;application-jar&gt; \<br/>[application-arguments]</pre> <p>Parameter description:</p> <ul style="list-style-type: none"> <li>● <b>--class</b>: indicates the name of the class of a Spark application.</li> <li>● <b>--master</b>: indicates the master to which the Spark application links, such as Yarn-client and Yarn-cluster.</li> <li>● <b>application-jar</b>: indicates the path of the JAR file of the Spark application.</li> <li>● <b>application-arguments</b>: indicates the parameter required to submit the Spark application. (This parameter can be empty.)</li> </ul> <p>The parameters that need to be added depend on the scenario:</p> <ul style="list-style-type: none"> <li>● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake cluster that uses Spark 3, add the following parameter: <ul style="list-style-type: none"> <li>- Parameter: <b>jars</b></li> <li>- Value: <b>'/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-core_2.12-*.jar,/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-storage-*.jar'</b></li> </ul> <p><b>CAUTION</b><br/>Replace the parameter values with the actual environment directory and Delta Lake version.</p> </li> <li>● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake 2.1.0 cluster that uses Spark 2.4.8, add the following parameter: <ul style="list-style-type: none"> <li>- Parameter: <b>mgc.delta.spark.version</b></li> <li>- Value: <b>2</b></li> </ul> </li> </ul> |

**Table 1-94** Parameters for creating a date-based verification task

| Area          | Parameter                      | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic Info    | Task Name                      | The default name is <i>Component-date-based-Verification-4 random characters</i> (including letters and numbers). You can also customize a name.                                                                                                                                                                                                                                                                                                                                  |
| Task Settings | Table Groups                   | Select the table groups that contain the tables to be verified.                                                                                                                                                                                                                                                                                                                                                                                                                   |
|               | Executor Connection            | This parameter is available for Hive, Delta Lake, and Hudi. <ul style="list-style-type: none"> <li>To create a verification task for the source, select the source executor connection.</li> <li>To create a verification task for the target, select the target executor connection.</li> </ul>                                                                                                                                                                                  |
|               | DLI Connection                 | If DLI is selected in the previous step, the task can only be created for the target. You need to select the <b>created DLI connection</b> .                                                                                                                                                                                                                                                                                                                                      |
|               | Metadata Connection (Optional) | This parameter is available for Hive and Delta Lake.<br>If you are creating a verification task for the target Hive cluster, select the metadata connection to this Hive cluster. The connection is used to check whether the partitions to be verified can be found in the target cluster.<br>If you are creating a verification task for the source Delta Lake cluster, to improve processing efficiency, you can select metadata connections to the source Delta Lake cluster. |
|               | Execution Time                 | Specify when the task will be executed. After the task is activated, it will be automatically executed at the specified time every day.                                                                                                                                                                                                                                                                                                                                           |

| Area | Parameter        | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Advanced Options | <ul style="list-style-type: none"> <li> <b>Concurrency:</b> Specify the number of concurrent threads on an executor for the verification task. The default value is <b>3</b>. The value ranges from <b>1</b> to <b>10</b>.                     </li> </ul> <p><b>CAUTION</b></p> <p>If you are creating a verification task for an Alibaba Cloud EMR Hive cluster, set this parameter based on the source data volume and master node specifications. Consider the following rules:</p> <ul style="list-style-type: none"> <li>The total number of concurrent threads for verification tasks running simultaneously in the source cluster cannot exceed 70% of the total number of cores on the metadata node.</li> <li>The total resources allocated to verification tasks cannot exceed the resources of the execution queue. The total resources allocated to tasks can be calculated as follows:<br/>                     Allocated memory = Number of executors × Memory on an executor × Concurrency<br/>                     Allocated cores = Number of executors × Cores on an executor × Concurrency</li> </ul> <p>Assume that the total source data volume is 500 GB spread across 10,000 tables, in which there are 8 large tables with 50 GB data and 100,000 partitions. The master node has 8 vCPUs and 32 GB of memory.</p> <ul style="list-style-type: none"> <li>According to rule 1, the maximum number of concurrent requests is 5, which is the rounded down value of 5.6 (<math>0.7 \times 8</math>).</li> <li>According to rule 2, you need to select <b>spark-sql</b> in the <b>Execution Command</b> area and set the following parameters:</li> </ul> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p>Execution Command</p> <p>baseline hive <b>spark-sql</b></p> <p>executor-memory 4G</p> <p>master yarn</p> <p>num-executors 20</p> <p>executor-cores 2</p> <p>driver-memory 10G <span style="float: right;">Add</span></p> <p>Script Preview</p> <pre>spark-sql --executor-memory 4G --master yarn --num-executors 20 --executor-cores 2 --driver-memory 10G -f</pre> </div> <p>executor-memory = 4G<br/>                     master = yarn<br/>                     num-executors = 20<br/>                     executor-cores = 2<br/>                     driver-memory = 10G</p> <li> <b>Max. SQL Statements Per File:</b> Each time the task is executed, files are created for storing the SQL statements generated for querying tables. You can control how many SQL statements can be stored in a single file. The default value is <b>10</b>. The recommended value ranges from <b>1</b> to <b>50</b>.                     </li> |

| Area           | Parameter                          | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                |                                    | <ul style="list-style-type: none"> <li>• <b>Timeout (s)</b>: indicates the maximum time allowed for an SQL statement to end normally. The unit is second (s). The default value is <b>600</b>. The value ranges from <b>600</b> to <b>7,200</b>.</li> <li>• <b>Send SMN Notifications</b>: Determine whether to use SMN to notify you of the task status in a timely manner through emails, SMS messages, or customized URLs.</li> </ul> <p><b>NOTICE</b></p> <ul style="list-style-type: none"> <li>- Before enabling this function, you need to create a topic on the SMN console. For details, see <a href="#">Creating a Topic</a>.</li> <li>- Using this function may incur a small amount of fees, which are billed by SMN. For details, see <a href="#">SMN Billing</a>.</li> </ul> |
| Data Filtering | Time Range                         | <p>Select the time period in which the incremental data needs to be verified as consistent. By default, a 24-hour period is selected. <b>T</b> indicates the execution time of the task, and <b>T-n</b> indicates a time <math>n \times 24</math> hours before the execution time.</p> <p>If you select <b>Consecutive days</b>, the system verifies consistency of the incremental data generated during the specified days.</p>                                                                                                                                                                                                                                                                                                                                                          |
|                | Non-partitioned Table Verification | <p>Decide how to verify non-partitioned tables.</p> <ul style="list-style-type: none"> <li>• <b>Verify all</b>: All non-partitioned tables are verified as consistent.</li> <li>• <b>Skip all</b>: All non-partitioned tables are skipped during consistency verification.</li> <li>• <b>Filter by update time</b>: Only non-partitioned tables whose update time falls within the specified time range are verified as consistent. The update time of a non-partitioned table may not be accurate if it contains non-inserted data, and it may be excluded from verification.</li> </ul>                                                                                                                                                                                                  |
|                | Advanced Options                   | <p><b>Max. Fields per SQL Statement</b>: Limit how many fields can be queried by one SQL statement. Too many or few fields in a SQL statement results in low query efficiency. The default value <b>0</b> means no limit is set. The value ranges from <b>100</b> to <b>500</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Area                                                      | Parameter               | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OBS Bucket Check                                          | -                       | <ul style="list-style-type: none"> <li>If you need to upload task logs and content verification results to an OBS bucket for management and analysis, <a href="#">configure an OBS bucket</a>. After the bucket is configured, the task logs and content verification results will be automatically uploaded to the specified OBS bucket.</li> <li>If you do not need to upload the task logs and content verification results to OBS, select <b>I confirm that I only need to view logs and data verification results on the MgC Agent and do not need to upload them to OBS.</b></li> </ul> |
| Execution Script (Hive)                                   | Security Authentication | <p>If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the <b>.keytab</b> file that contains the authentication key to the executor.</p> <ul style="list-style-type: none"> <li><b>Keytab Path:</b> Enter the path where the <b>.keytab</b> file is stored on the executor.</li> <li><b>Keytab Principal:</b> Enter the user name corresponding to the <b>.keytab</b> file.</li> </ul>                                                |
|                                                           | Execution Command       | <p>You can configure Beeline or Spark SQL command parameters to run SQL statements for consistency verification.</p> <ul style="list-style-type: none"> <li><b>Beeline:</b> a command line tool used to interact with Hive.</li> <li><b>Spark SQL:</b> a command line tool used to execute SQL statements to query and analyze Hive data.</li> </ul>                                                                                                                                                                                                                                          |
| MaxCompute Parameters (MaxCompute)                        | -                       | <p>Add MaxCompute parameters as needed. For details about the parameters, see <a href="#">MaxCompute Documentation</a>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Execution Settings (This item is only available for DLI.) | Parameter               | <p>Set the parameters as required. For details about the supported custom parameters, see <a href="#">Custom Parameters</a>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |



| Area                                                      | Parameter                                                               | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Command Parameters<br>(available for Delta Lake and Hudi) | Security Authentication (only available for target Delta Lake clusters) | If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the <b>.keytab</b> file that contains the authentication key to the executor. <ul style="list-style-type: none"> <li>• <b>Keytab Path:</b> Enter the path where the <b>.keytab</b> file is stored on the executor.</li> <li>• <b>Keytab Principal:</b> Enter the principal of the <b>.keytab</b> file.</li> </ul> |
|                                                           | spark-sql                                                               | Spark SQL is a module used in Spark for structured data processing. In Spark applications, you can seamlessly use SQL statements or DataSet APIs to query structured data. For more information, see <a href="#">SparkSQL Principles</a> . Retain the default settings.                                                                                                                                                                                                                                                       |

| Area | Parameter    | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | spark-submit | <p>This is a basic Spark shell command used to submit Spark applications. The command is as follows:</p> <pre>./bin/spark-submit \<br/>--class &lt;main-class&gt; \<br/>--master &lt;master-url&gt; \<br/>... # other options \<br/>&lt;application-jar&gt; \<br/>[application-arguments]</pre> <p>Parameter description:</p> <ul style="list-style-type: none"> <li>● <b>--class</b>: indicates the name of the class of a Spark application.</li> <li>● <b>--master</b>: indicates the master to which the Spark application links, such as Yarn-client and Yarn-cluster.</li> <li>● <b>application-jar</b>: indicates the path of the JAR file of the Spark application.</li> <li>● <b>application-arguments</b>: indicates the parameter required to submit the Spark application. (This parameter can be empty.)</li> </ul> <p>The parameters that need to be added depend on the scenario:</p> <ul style="list-style-type: none"> <li>● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake cluster that uses Spark 3, add the following parameter: <ul style="list-style-type: none"> <li>- Parameter: <b>jars</b></li> <li>- Value: <b>'/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-core_2.12-*.jar,/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-storage-*.jar'</b></li> </ul> <p><b>CAUTION</b><br/>Replace the parameter values with the actual environment directory and Delta Lake version.</p> </li> <li>● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake 2.1.0 cluster that uses Spark 2.4.8, add the following parameter: <ul style="list-style-type: none"> <li>- Parameter: <b>mgc.delta.spark.version</b></li> <li>- Value: <b>2</b></li> </ul> </li> </ul> |

**Table 1-95** Parameters for creating a selective verification task

| Area           | Parameter        | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic Info     | Task Name        | The default name is <i>Component-selective verification-4 random characters</i> (including letters and numbers). You can also customize a name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Task Settings  | Table Groups     | Select the table groups that contain the tables to be verified.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                | HBase Connection | This parameter is available for HBase and CloudTable (HBase). <ul style="list-style-type: none"> <li>To create a verification task for the source, select the source HBase connection.</li> <li>To create a verification task for the target, select the target HBase or CloudTable (HBase) connection.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                | Advanced Options | <ul style="list-style-type: none"> <li><b>Concurrency:</b> Specify the number of concurrent threads on an executor for the verification task. The default value is <b>3</b>. The value ranges from <b>1</b> to <b>10</b>.</li> <li><b>Timeout (s):</b> indicates the maximum time allowed for an SQL statement to end normally. The unit is second (s). The default value is <b>600</b>. The value ranges from <b>600</b> to <b>7,200</b>.</li> <li><b>Send SMN Notifications:</b> Determine whether to use SMN to notify you of the task status in a timely manner through emails, SMS messages, or customized URLs.<br/><b>NOTICE</b> <ul style="list-style-type: none"> <li>Before enabling this function, you need to create a topic on the SMN console. For details, see <a href="#">Creating a Topic</a>.</li> <li>Using this function may incur a small amount of fees, which are billed by SMN. For details, see <a href="#">SMN Billing</a>.</li> </ul> </li> </ul> |
| Data Filtering | Time Range       | Select the time period in which the data needs to be verified as consistent.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Area                       | Parameter | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OBS Bucket Check           | -         | <ul style="list-style-type: none"><li>If you need to upload task logs and content verification results to an OBS bucket for management and analysis, <a href="#">configure an OBS bucket</a>. After the bucket is configured, the task logs and content verification results will be automatically uploaded to the specified OBS bucket.</li><li>If you do not need to upload the task logs and content verification results to OBS, select <b>I confirm that I only need to view logs and data verification results on the MgC Agent and do not need to upload them to OBS.</b></li></ul>                                                                                                                          |
| Execution Settings (HBase) | Run Mode  | <p>The supported run modes include:</p> <ul style="list-style-type: none"><li><b>Yarn:</b> For large-scale distributed environments. It can make full use of cluster resources and improve verification concurrency and efficiency.</li></ul> <p><b>NOTE</b><br/>Normal MRS 3.1.0 clusters use the Yarn mode. You need to replace packages when you create verification tasks for such clusters. For details, see <a href="#">How Do I Replace Packages When I Create a Verification Task for an MRS 3.1.0 Cluster Using Yarn?</a></p> <ul style="list-style-type: none"><li><b>Local:</b> For small-scale datasets or testing and development environments. It enables rapid debugging and verification.</li></ul> |
|                            | Parameter | Add command parameters based on the selected run mode and requirements.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

**Step 7** Click **Save**. After the creation is successful, the system automatically synchronizes the task settings to the MgC Agent. Then in the task list, you can view the created task and its settings synchronization status.

**Step 8** After the settings synchronization is complete, execute the task using either of the following methods:

- **Automatic execution:** The task will be executed at the specified time automatically.
  - a. In the task list, locate the task and click **Activate** in the **Schedule Status** column.
  - b. In the displayed dialog box, click **OK** to activate the task.
- **Manual execution:** You can manually execute the task immediately.
  - a. In the task list, locate the task and click **Execute** in the **Operation** column.
  - b. In the displayed dialog box, click **OK** to execute the task immediately.

**Step 9** Click **View Executions** in the **Operation** column. On the executions list page, you can:

- View the status, progress statistics, and execution start time and end time of each task execution.



If a task execution takes a long time or the page is incorrectly displayed, set the log level of the executor's Driver to **ERROR**.

- Upload the logs of a task execution to your OBS bucket for review and analysis by clicking **Upload Log** in the **Operation** column. Before uploading logs, you need to configure a log bucket on the MgC Agent console. For details, see [Configuring a Log Bucket](#).
- Cancel a running execution or terminate an execution using the **Cancel/Terminate** button.
- If there are tables whose verification results are not obtained, obtain the results again by clicking **Path** in the **Statistics** column.

----End

## View the Summary of Verification Results

MgC provides reports and summaries of data verification results to help you easily review them. You can filter the verification results by component.

**Figure 1-64** Filtering the verification results by component

| Verification Item | 2025-01-10 To... | 2025-01-11 To... | 2025-01-12 To... | 2025-01-13 To... | 2025-01-14 To... | 2025-01-15 To... |
|-------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Total tables      | 0                | 0                | 0                | 0                | 0                | 0                |
| No results        | 0                | 0                | 0                | 0                | 0                | 0                |
| Count             | Pass             | 0                | 0                | 0                | 0                | 0                |
| Count             | Fail             | 0                | 0                | 0                | 0                | 0                |
| Count             | Pass             | Sum              | Pass             | 0                | 0                | 0                |
| Count             | Pass             | Sum              | Fail             | 0                | 0                | 0                |
| Count             | Fail             | Sum              | Fail             | 0                | 0                | 0                |
| Count             | Pass             | Sum              | Pass             | AISSum           | Pass             | 0                |
| Count             | Pass             | Sum              | Pass             | AISSum           | Fail             | 0                |
| Count             | Pass             | Sum              | Fail             | AISSum           | Fail             | 0                |
| Count             | Fail             | Sum              | Fail             | AISSum           | Fail             | 0                |

The following table describes the verification items displayed in the summary.

**Table 1-96** Verification items

| Verification Item | Description                                                       |
|-------------------|-------------------------------------------------------------------|
| Total tables      | The number of tables whose data is verified.                      |
| No results        | The number of tables whose verification results are not obtained. |
| Count pass        | The number of tables that meet the Count verification rule.       |

| Verification Item                   | Description                                                                                                       |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Count fail                          | The number of tables that do not meet the Count verification rule.                                                |
| Count and Sum pass                  | The number of tables that meet both the Count and Sum verification rules.                                         |
| Count pass, but Sum fail            | The number of tables that meet the Count verification rule but do not meet the Sum verification rule.             |
| Count and Sum fail                  | The number of tables that do not meet the Count and Sum verification rules.                                       |
| Count, Sum, and AllSum pass         | The number of tables that meet the Count, Sum, and AllSum verification rules.                                     |
| Count and Sum pass, but AllSum fail | The number of tables that meet the Count and Sum verification rules but do not meet the AllSum verification rule. |
| Count pass, but Sum and AllSum fail | The number of tables that meet the Count verification rule but do not meet the Sum and AllSum verification rules. |
| Count, Sum, and AllSum fail         | The number of tables that do not meet the Count, Sum, and AllSum verification rules.                              |

## 1.12.7 Viewing and Exporting Verification Results

After the verification tasks on the source and the target are executed, you can view and export the verification results of tables by batch. A batch is a group of verification tasks executed on the same day. If a task is executed multiple times on a single day, only the latest verification results are included in the statistics. Its previous results will be overwritten.

### Prerequisites

You have [created and executed verification tasks](#).

### Precautions

When sum operations (like sum or allsum) are performed, if the results exceed the valid digit limit of the Double type, the precision is lost. Additionally, when very large floating-point numbers are verified, the actual differences may not be detected if they exceed the significant digits that the Double type can represent. In such cases, the calculated differences may erroneously appear as 0.

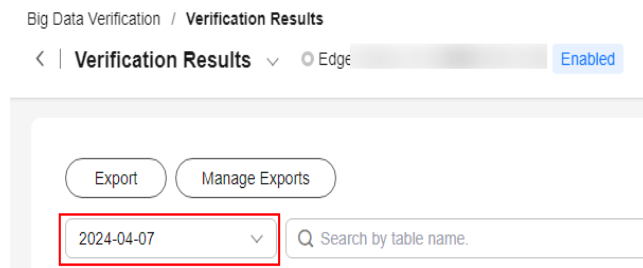
### Viewing Verification Results

**Step 1** Sign in to the [MgC console](#). In the navigation pane, under **Project**, select a [big data migration project](#) from the drop-down list.

**Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**.

**Step 3** In the **Features** area, click **Verification Results**.

**Step 4** Select a task batch (date).



**Step 5** In the list, perform the following operations on a table:

- View the verification details of table partitions by clicking the **View** in the **Partitions** column. Then click **View Details** to view the verification results of a table partition.
- Viewing the historical verification results by clicking **View History** in the **Operation** column.

----End

## Exporting Verification Results

**Step 1** On the **Verification Results** page, choose **Export > Export Verification Results**.

**Step 2** Select a batch and table group, and then click **Confirm**.

**Step 3** After the export is complete, click **Manage Exports**.

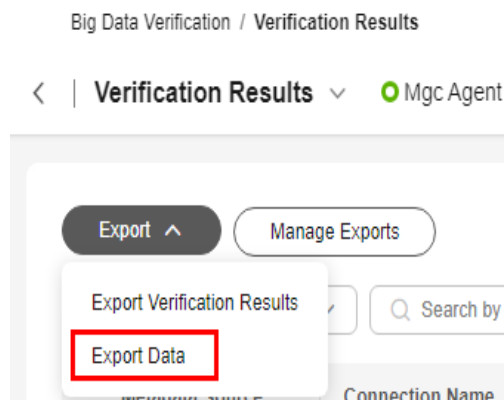
**Step 4** Click **Download** in the **Operation** column to download the verification results.

----End

## Exporting Data

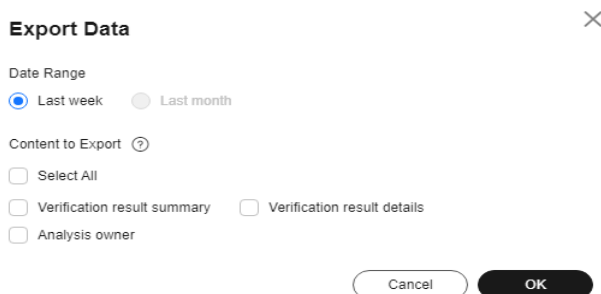
**Step 1** On the **Verification Results** page, choose **Export > Export Data**.

**Figure 1-65** Export Data



**Step 2** Select the date range and content to be exported, and click **OK**. The system starts to export the data.

**Figure 1-66** Selecting the scope of data to be exported



**Step 3** After the export is complete, click **Manage Exports**.

**Step 4** Click **Download** in the **Operation** column to download the file.

----End

## 1.12.8 Custom Parameters

The following table lists the custom parameters supported when you create a DLI verification task.

**Table 1-97** Custom parameters supported for DLI verification tasks

| Parameter                         | Default Value | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| mgc.mc2dli.table.partition.enable | true          | Indicates whether to query the DLI metadata when a DLI table partition is empty or missing. <ul style="list-style-type: none"> <li>If this parameter is set to <b>true</b>, the verification status of any empty DLI table partitions will be succeeded, and that of any missing partitions will be failed.</li> <li>If this parameter is set to <b>false</b>, the verification status of any empty or missing DLI table partitions will be succeeded.</li> </ul> |
| spark.sql.files.maxRecordsPerFile | 0             | The maximum number of records to be written into a single file. If the value is zero or negative, there is no limit.                                                                                                                                                                                                                                                                                                                                              |



| Parameter                                   | Default Value | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| spark.sql.autoBroadcastJoinThreshold        | 209715200     | <p>The maximum size of the table that displays all working nodes when a connection is executed. You can set this parameter to <b>-1</b> to disable the display.</p> <p><b>NOTE</b><br/>Currently, only the configuration unit metastore table that runs the <b>ANALYZE TABLE COMPUTE statistics noscan</b> command and the file-based data source table that directly calculates statistics based on data files are supported.</p>                                                                                                                |
| spark.sql.shuffle.partitions                | 200           | The default number of partitions used to filter data for join or aggregation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| spark.sql.dynamicPartitionOverwrite.enabled | false         | <p>Whether DLI overwrites the partitions where data will be written into during runtime. If you set this parameter to <b>false</b>, all partitions that meet the specified condition will be deleted before data overwrite starts. For example, if you set this parameter to <b>false</b> and use INSERT OVERWRITE to write partition 2021-02 to a partitioned table that has the 2021-01 partition, this partition will be deleted.</p> <p>If you set this parameter to <b>true</b>, DLI does not delete partitions before overwrite starts.</p> |
| spark.sql.files.maxPartitionBytes           | 134217728     | The maximum number of bytes to be packed into a single partition when a file is read.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| spark.sql.badRecordsPath                    | -             | The path of bad records.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Parameter                                        | Default Value | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| spark.sql.legacy.correlated.scalar.query.enabled | false         | <ul style="list-style-type: none"> <li>● <b>If set to true:</b> <ul style="list-style-type: none"> <li>– When there is no duplicate data in a subquery, executing a correlated subquery does not require deduplication from the subquery's result.</li> <li>– If there is duplicate data in a subquery, executing a correlated subquery will result in an error. To resolve this, the subquery's result must be deduplicated using functions such as <b>max()</b> or <b>min()</b>.</li> </ul> </li> <li>● <b>If set to false:</b> <p>Regardless of whether there is duplicate data in a subquery, executing a correlated subquery requires deduplicating the subquery's result using functions such as <b>max()</b> or <b>min()</b>. Otherwise, an error will occur.</p> </li> </ul> |

# 2 Old Edition

---

## 2.1 Permissions Management

### 2.1.1 Creating a User and Granting MgC Permissions

This section describes how to use [Identity and Access Management \(IAM\)](#) for fine-grained permissions control on your Migration Center (MgC) resources. With IAM, you can:

- Create IAM users for employees based on the organizational structure of your enterprise. Each IAM user has their own security credentials for accessing MgC resources.
- Grant only the permissions required for users to perform a specific task.
- Entrust a Huawei Cloud account or cloud service to perform professional and efficient O&M on your MgC resources.

If your Huawei Cloud account does not need individual IAM users, then you may skip over this section.

This section describes the procedure for granting permissions (see [Process Flow](#)).

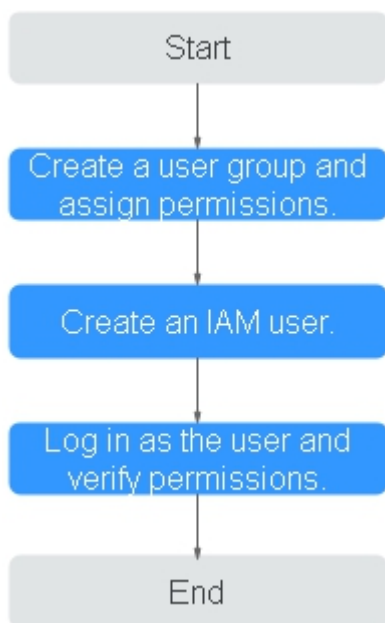
#### Prerequisites

Before assigning permissions to user groups, you should learn about system-defined policies supported by MgC and select the policies based on service requirements.

For details about the system-defined policies supported by MgC and the comparison between them, see [System-defined Policies](#). For the system-defined policies of other services, see [System-defined Permissions](#).

## Process Flow

**Figure 2-1** Granting MgC permissions to users



1. **Create a user group and assign permissions** to it.
  - **System-defined policy:** Create a user group on the IAM console, and assign the MgC system-defined policies to the user group based on the [Description of MgC System-defined Policies](#) and actual permissions requirements. Select **All Resources** for **Scope**.

**Table 2-1** MgC system-defined policies

| Policy Name        | Description                                                                                             | Policy Type           | Policy Content                                    |
|--------------------|---------------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------|
| MgC FullAccess     | Administrator permissions for MgC. Users with these permissions can perform all operations on MgC data. | System-defined policy | <a href="#">MgC FullAccess Policy Content</a>     |
| MgC ReadOnlyAccess | Read-only permissions for MgC. Users with permissions can only view MgC data.                           | System-defined policy | <a href="#">MgC ReadOnlyAccess Policy Content</a> |

| Policy Name               | Description                                                                                                                                                                                      | Policy Type           | Policy Content                                        |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------------------------|
| MgC<br>DiscoveryAccess    | Permissions for resource discovery of MgC. Users with these permissions can use the resource discovery function of MgC and view MgC data.                                                        | System-defined policy | <a href="#">MgC DiscoveryAccess Policy Content</a>    |
| MgC<br>AssessAccess       | Permissions for application assessment of MgC. Users with these permissions can use the resource discovery and application assessment functions of MgC and view MgC data.                        | System-defined policy | <a href="#">MgC AssessAccess Policy Content</a>       |
| MgC<br>MigrateAccess      | Permissions for application migration of MgC. Users with these permissions can use the resource discovery, application assessment, and application migration functions of MgC and view MgC data. | System-defined policy | <a href="#">MgC MigrateAccess Policy Content</a>      |
| MgC<br>AppDiscoveryAccess | Permissions for resource discovery of MgC. Users with these permissions can use the resource discovery and data collection functions of MgC and view MgC data.                                   | System-defined policy | <a href="#">MgC AppDiscoveryAccess Policy Content</a> |
| MgC<br>MrrAccess          | Permissions for service verification of MgC. Users with these permissions can use the service verification function of MgC and view MgC data.                                                    | System-defined policy | <a href="#">MgC MrrAccess Policy Content</a>          |

- **Custom policy:** If an IAM user only needs specific MgC permissions, create custom policies. For details, see [MgC Custom Policies](#).
2. **Create an IAM user and add it to the user group.**  
Create a user on the IAM console and add the user to the group created in 1.

**NOTICE**

When the IAM user access certain MgC functions for the first time, the IAM user needs to authorize MgC through agencies. Therefore, the IAM user must have the permissions required to create agencies. There are two methods for the IAM user to obtain the required permissions.

- (Recommended) Ask the administrator to log in to the MgC console and access the corresponding functions to complete the authorization.
- Ask the administrator to grant the corresponding system-defined MgC permissions and the **iam:agencies:createAgency**, **iam:permissions:grantRoleToAgency**, and **iam:roles:updateRole** permissions on the IAM console.

3. **Sign in** and verify permissions.

Sign in to the IAM console using the created IAM user, and in the authorized region, perform the following operations:

- Choose **Service List > Migration Center**. On the MgC console, perform operations based on the granted permissions. If you can, the granted permissions have taken effect.
- Choose another service from **Service List**. If a message appears indicating that you have insufficient permissions to access the service, the granted permissions have taken effect.

## MgC FullAccess Policy Content

```
{
 "Version": "1.1",
 "Statement": [
 {
 "Action": [
 "mgc:*:*",
 "iam:agencies:listAgencies",
 "iam:roles:listRoles",
 "iam:quotas:listQuotas",
 "iam:permissions:listRolesForAgency"
],
 "Effect": "Allow"
 }
]
}
```

## MgC ReadOnlyAccess Policy Content

```
{
 "Version": "1.1",
 "Statement": [
 {
 "Effect": "Allow",
 "Action": [
 "mgc:*:query*"
]
 }
]
}
```

## MgC DiscoveryAccess Policy Content

```
{
 "Version": "1.1",
```

```
"Statement": [
 {
 "Effect": "Allow",
 "Action": [
 "mgc:*:query**",
 "mgc:*:discovery"
]
 }
]
```

## MgC AssessAccess Policy Content

```
{
 "Version": "1.1",
 "Statement": [
 {
 "Action": [
 "mgc:*:query**",
 "mgc:*:discovery",
 "mgc:*:assess",
 "iam:agencies:listAgencies",
 "iam:roles:listRoles",
 "iam:quotas:listQuotas",
 "iam:permissions:listRolesForAgency"
],
 "Effect": "Allow"
 }
]
}
```

## MgC MigrateAccess Policy Content

```
{
 "Version": "1.1",
 "Statement": [
 {
 "Action": [
 "mgc:*:query**",
 "mgc:*:discovery",
 "mgc:*:assess",
 "mgc:*:migrate",
 "iam:agencies:listAgencies",
 "iam:roles:listRoles",
 "iam:quotas:listQuotas",
 "iam:permissions:listRolesForAgency"
],
 "Effect": "Allow"
 }
]
}
```

## MgC AppDiscoveryAccess Policy Content

```
{
 "Version": "1.1",
 "Statement": [
 {
 "Effect": "Allow",
 "Action": [
 "mgc:*:query**",
 "mgc:*:discovery",
 "mgc:*:appdiscovery"
]
 }
]
}
```

## MgC MrrAccess Policy Content

```
{
 "Version": "1.1",
 "Statement": [
 {
 "Action": [
 "mgc:*:query*",
 "mgc:mrr:query",
 "mgc:mrr:update",
 "mgc:mrr:export",
 "mgc:mrr:import",
 "mgc:mrr:upgrade",
 "mgc:mrr:delete",
 "mgc:mrr:check"
],
 "Effect": "Allow"
 }
]
}
```

### 2.1.2 MgC Custom Policies

Custom policies can be created to supplement the system-defined policies of MgC.

You can create custom policies in either of the following ways:

- Visual editor: Select cloud services, actions, resources, and request conditions. This does not require knowledge of policy syntax.
- JSON: Create a JSON policy from scratch or based on an existing policy.

For details, see [Creating a Custom Policy](#). The following section contains examples of common MgC custom policies.

#### Example MgC Custom Policies

- Allowing users to perform platform collection and resource management

```
{
 "Version": "1.1",
 "Statement": [
 {
 "Effect": "Allow",
 "Action": [
 "mgc:*:query*",
 "mgc:*:discovery"
]
 }
]
}
```

- Allowing users to perform TCO analysis and server assessment

```
{
 "Version": "1.1",
 "Statement": [
 {
 "Action": [
 "mgc:*:query*",
 "mgc:*:discovery",
 "mgc:*:assess",
 "iam:agencies:listAgencies",
],
 "Effect": "Allow"
 }
]
}
```



- ```
]
}
```
- Allowing users to perform application dependency mapping

```
{
  "Version": "1.1",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "mgc:*:query*",
        "mgc:*:discovery",
        "mgc:*:appdiscovery"
      ]
    }
  ]
}
```
 - Allowing users to use migration workflows

```
{
  "Version": "1.1",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "mgc:*:query*",
        "mgc:*:discovery",
        "mgc:*:assess",
        "mgc:*:migrate",
        "iam:agencies:listAgencies"
      ]
    }
  ]
}
```

2.1.3 Agency Permissions

Overview

To use some functions of MgC, you must delegate MgC the required permissions so that we can provide you with complete services. This section describes the scenarios where authorization is required and what custom permission policies will be created.

The system may create a new custom policy or update an existing policy during the authorization.

- If there is no available custom policy, the system automatically creates a new one. For details about how to create a custom policy, see [Creating a Custom Policy](#).
- If there is an available custom policy but it does not contain required permissions, the system automatically updates the policy.

Creating a Cross-AZ Migration Workflow

Scenario	Delegated Object	Custom Policy	Minimal Permissions
Creating a cross-AZ migration workflow	MgC	MgC AzMigrationAgencyPolicy	ecs:cloudServers:showServer (Querying details about an ECS) ecs:flavors:get (Querying ECS flavors) ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information) ecs:cloudServerQuotas:get (Querying quotas of a tenant) ecs:servers:list (Querying ECSs) ecs:cloudServers:list (Querying details about ECSs) ecs:servers:stop (Stopping an ECS) ecs:cloudServers:listServerInterfaces (Querying NICs of an ECS) ecs:cloudServers:createServers (Creating an ECS) ecs:cloudServers:listServerBlockDevices (Querying information about the disks attached to an ECS) ecs:cloudServerNics:update (Configuring a private IP address for a NIC of an ECS) ecs:availabilityZones:list (Listing AZs) ecs:servers:start (Starting an ECS) ecs:cloudServers:changeNetworkInterface (Updating attributes of a specified NIC on an ECS) ecs:serverInterfaces:get (Querying ECS NICs) ecs:cloudServers:get (Querying details about an ECS) vpc:publicIps:create (Creating an EIP) vpc:publicIps:update (Updating an EIP) vpc:subnets:get (Querying subnets) vpc:networks:get (Querying networks) vpc:publicIps:list (Querying EIPs) vpc:publicIps:list (Querying details about an EIP)

Scenario	Delegated Object	Custom Policy	Minimal Permissions
			vpc:ports:get (Querying ports or querying details about a port) vpc:ports:delete (Deleting a port) vpc:ports:update (Updating a port) vpc:ports:create (Creating a port) evs:types:get (Querying EVS disk types) evs:volumes:list (Querying EVS disks) cbr:vaults:get (Querying a specified vault) cbr:vaults:list (Querying vaults) cbr:vaults:create (Creating a vault) cbr:vaults:addResources (Associating resources) cbr:vaults:backup (Creating a restore point) cbr:backups:list (Querying backups) cbr:tasks:list (Querying tasks) cbr:tasks:get (Querying details about a task) cbr:backups:delete (Deleting a backup) cbr:backups:get (Querying a backup) cbr:vaults:delete (Deleting a vault) ims:wholeImages:create (Creating a full-ECS image) ims:images:list (Querying images) ims:images:delete (Deleting an image) ims:images:get (Querying details about an image) ims:serverImages:create (Creating an image)

Migration Cost Analysis

Scenario	Delegated Object	Custom Policy	Minimal Permissions
Creating a migration cost analysis task	MgC	MgC TcoAgencyPolicy	ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information) evs:types:get (Querying EVS disk types) ims:*:get* (Querying details about an image) ims:*:list* (Querying images)

Getting Target Recommendations

Scenario	Delegated Object	Custom Policy	Minimal Permissions
Getting target recommendations	MgC	MgC ServerAssessAgencyPolicy	ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information) ims:images:list (Querying images) evs:types:get (Querying EVS disk types) deh:dedicatedHosts:get (Obtaining details about a DeH) deh:dedicatedHosts:list (Listing DeHs)

Binding a Source Server to an Existing Target Server

Scenario	Delegated Object	Custom Policy	Minimal Permissions
Binding a source server to an existing target server	MgC	MgC ServerBindTargetAgencyPolicy	ecs:cloudServers:showServer (Querying details about an ECS) evs:volumes:list (Querying EVS disks) ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information)

Creating a Server Migration Workflow

Scenario	Delegated Object	Custom Policy	Minimal Permissions
Creating a Server Migration Workflow	MgC	MgC ServerMigrationAgencyPolicy	ecs:cloudServers:showServer (Querying details about an ECS) ecs:cloudServers:createServers (Creating an ECS) sms:server:migrationServer (Migrating a source server) sms:server:queryServer (Querying source servers) ecs:cloudServers:list (Querying ECSs) ecs:cloudServers:listServerBlockDevices (Querying information about the disks attached to an ECS) ecs:cloudServerQuotas:get (Querying quotas of a tenant) vpc:publicIps:create (Creating an EIP) ecs:cloudServers:get (Querying details about an ECS) ecs:cloudServers:changeVpc (Changing a VPC for an ECS) ecs:cloudServers:attach (Attaching a disk to an ECS) ecs:cloudServers:start (Starting ECSs in batches) ecs:cloudServers:detachVolume (Detaching a disk from a specified ECS) ecs:cloudServers:stop (Stopping ECSs in batches) ecs:servers:unlock (Unlocking an ECS) evs:volumes:delete (Deleting an EVS disk) evs:volumes:use (Attaching and detaching EVS disks) evs:volumes:get (Querying details about an EVS disk) vpc:privateIps:list (Querying private IP addresses)

Scenario	Delegated Object	Custom Policy	Minimal Permissions
			ims:images:get (Querying details about an image)

Purchasing Resources

Scenario	Delegated Object	Custom Policy	Minimal Permissions
Purchasing resources	MgC	MgC PurchaseAgencyPolicy	eps:resources:add (Adding resources to an enterprise project) ecs:cloudServers:createServers (Creating an ECS) evs:volumes:list (Querying EVS disks) ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information) ecs:cloudServers:list (Querying details about ECSs) vpc:publicIps:update (Updating an EIP) vpc:publicIps:create (Creating an EIP)

Configuring a Server Purchase Template

Scenario	Delegated Object	Custom Policy	Minimal Permissions
Configuring a server purchase template	MgC	MgC PurchaseTemplateAgencyPolicy	iam:projects:listProjects (Querying projects) eps:enterpriseProjects:list (Querying enterprise projects) vpc:subnets:get (Querying subnets or querying details about a subnet) vpc:securityGroups:get (Querying security groups or querying details about a security group) vpc:vpcs:get (Querying VPC details)

Creating Migration Plans

Scenario	Delegated Object	Custom Policy	Minimal Permissions
Creating a server migration plan (importing target server configurations from an OBS bucket)	MgC	MgC ImportTargetConfigurationAgencyPolicy	obs:object:GetObject (Obtaining object content and metadata) obs:bucket:ListBucket (Listing objects in a bucket) obs:bucket:ListAllMyBuckets (Listing buckets)
Creating a server migration plan (exporting target server configurations)		MgC ExportTargetConfigurationAgencyPolicy	ims:images:list (Listing images) ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information)

Scenario	Delegated Object	Custom Policy	Minimal Permissions
Creating a batch object storage migration plan (configuring target buckets)		MgC ListObsBucketsAgencyPolicy	obs:bucket:ListBucket (Listing objects in a bucket) obs:bucket:ListAllMyBuckets (Listing buckets)

Creating a Migration Cluster

Scenario	Delegated Object	Custom Policy	Minimal Permissions
Creating a migration cluster	OMS	OMS ObsMigrationAgencyPolicy	ecs:cloudServers:createServers (Creating an ECS) ecs:cloudServers:listServerInterfaces (Querying NICs of an ECS) ecs:cloudServers:showServer (Querying details about an ECS) ecs:cloudServers:deleteServers (Deleting ECSs) ecs:cloudServers:list (Querying details about ECSs) nat:natGateways:create (Creating a NAT Gateway) nat:natGateways:get (Querying details about a NAT gateway) nat:natGateways:delete (Deleting a NAT gateway) nat:snatRules:create (Creating an SNAT rule) nat:snatRules:get (Querying details about an SNAT rule) nat:dnatRules:list (Querying DNAT rules) nat:dnatRules:list (Querying DNAT rules) nat:snatRules:delete (Deleting an SNAT rule) nat:natGateways:list (Querying NAT gateways) vpc:securityGroups:create (Creating a security group) vpc:securityGroups:delete (Deleting a security group) vpc:securityGroups:get (Querying security groups or querying details about a security group) vpc:securityGroupRules:create (Creating a security group rule) vpc:securityGroupRules:get (Querying security group rules or querying details about a security group rule)

Scenario	Delegated Object	Custom Policy	Minimal Permissions
			vpc:securityGroupRules:delete (Deleting a security group rule) vpcep:epservices:create (Creating a VPC endpoint service) vpcep:epservices:get (Querying details about a VPC endpoint service) vpcep:permissions:list (Querying whitelist records of a VPC endpoint service) vpcep:connections:list (Querying connections of a VPC endpoint service) vpcep:epservices:list (Querying VPC endpoint services) vpcep:epservices:delete (Deleting a VPC endpoint service) vpcep:connections:update (Accepting or rejecting a VPC endpoint) vpcep:permissions:update (Batch adding or deleting whitelist records of a VPC endpoint service) lts:topics:create (Creating a log topic) lts:topics:delete (Deleting a log topic) lts:groups:create (Creating a log group) lts:groups:get (Querying details about a log group) lts:groups:delete (Deleting a log group)
	ECS	ECS ObsMigrationAgencyPolicy	apm:icmgr:* (Full permissions for the APM collection component)

Creating a Storage Migration Workflow

Scenario	Delegated Object	Custom Policy	Minimal Permissions
Creating a storage migration workflow	MgC	-	OMS Administrator (system-defined role, the administrator role of the OMS)

Importing RVTools Data

Scenario	Delegated Object	Custom Policy	Minimal Permissions
Importing RVTools data	MgC	MgC OfflineCollectionAgencyPolicy	obs:object:GetObject (Obtaining object content and metadata) obs:bucket:ListBucket (Listing objects in a bucket) obs:bucket:ListAllMyBuckets (Querying buckets)

2.1.4 IAM User Permissions

With IAM, you can grant fine-grained permissions to IAM users under your account by configuring permission policies.

The following table lists the permissions that are required for IAM users to use different MgC functions. For details about how to configure permission policies, see [Creating a Custom Policy](#).

Function	Permission
Configuring a server purchase template	vpc:vpcs:list (Listing VPCs) vpc:subnets:get (Querying subnets or querying details about a subnet) vpc:publicIps:list (Querying EIPs) vpc:securityGroups:get (Querying security groups or querying details about a security group) eps:enterpriseProjects:list (Listing enterprise projects) ecs:availabilityZones:list (Listing AZs)

Function	Permission
Creating a server migration workflow	<p>vpc:vpcs:list (Listing VPCs)</p> <p>vpc:vpcs:get (Querying VPC details)</p> <p>vpc:subnets:get (Querying subnets or querying details about a subnet)</p> <p>vpc:publicIps:list (Querying EIPs)</p> <p>vpc:publicIps:get (Querying details about an EIP)</p> <p>vpc:securityGroups:get (Querying security groups or querying details about a security group)</p> <p>eps:enterpriseProjects:list (Listing enterprise projects)</p> <p>eps:enterpriseProjects:get (Querying details about an enterprise project)</p>
Getting server recommendations	<p>ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information)</p> <p>ecs:cloudServers:list (Querying details about ECSs)</p> <p>ecs:cloudServers:showServer (Querying details about an ECS)</p> <p>ecs:flavors:get (Querying ECS flavors)</p> <p>ims:images:list (Querying images)</p> <p>ims:images:get (Querying details about an image)</p> <p>evs:volumes:list (Querying EVS disks)</p> <p>evs:types:get (Querying EVS disk types)</p>
Creating a Cross-AZ migration workflow	<p>ecs:availabilityZones:list (Listing AZs)</p>
Configuring Product Mappings for TCO Analysis	<p>ecs:cloudServerFlavors:get (Querying details about flavors and extended flavor information)</p> <p>ims:images:list (Querying images)</p> <p>evs:types:get (Querying EVS disk types)</p>
Creating a storage migration workflow	<p>Tenant Guest (read-only permissions for all cloud services except IAM)</p> <p>OMS Administrator (full permissions for OMS)</p>
Creating a migration cluster	<p>Tenant Guest (read-only permissions for all cloud services except IAM)</p> <p>OMS Administrator (full permissions for OMS)</p> <p>nat:natGateways:list (Querying NAT gateways)</p> <p>smn:topic:list (Querying a topic)</p>

Function	Permission
Creating an Agency	iam:agencies:listAgencies (Querying agencies based on specified conditions) iam:roles:listRoles (Listing permissions) iam:quotas:listQuotas (Listing quotas) iam:permissions:listRolesForAgency (Listing permissions of an agency) iam:agencies:createAgency (Creating an agency) iam:permissions:grantRoleToAgency (Granting specified permissions to an agency) iam:roles:createRole (Creating a custom policy) iam:roles:updateRole (Modifying a custom policy)

2.2 Settings Management

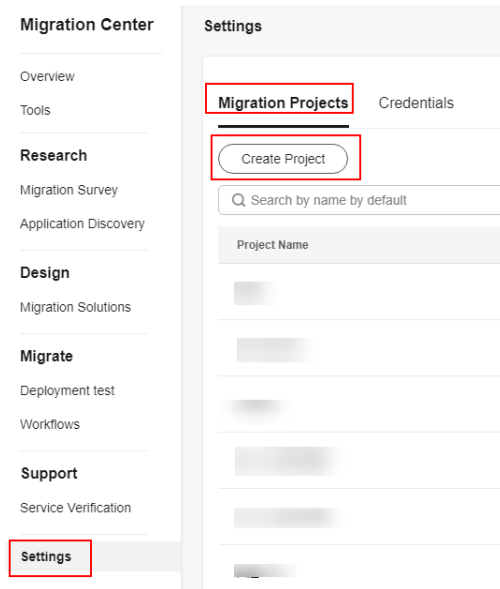
2.2.1 Managing Migration Projects

Scenarios

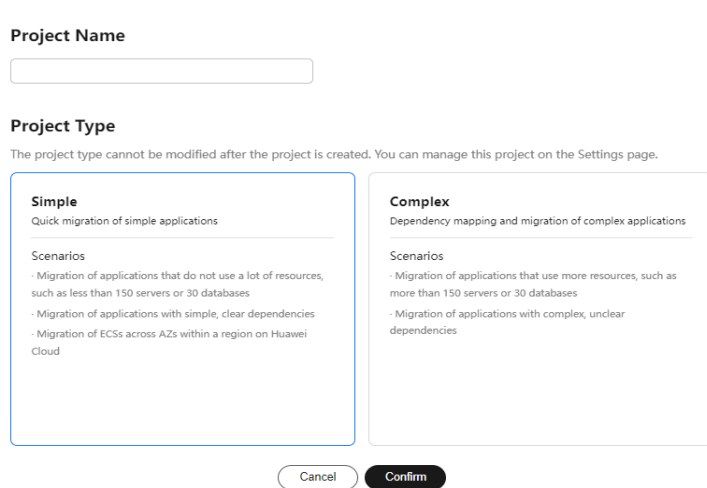
You can create a migration project to isolate and manage resources. For example, you can create a project for migration from Alibaba Cloud to Huawei Cloud. The information about your servers, databases, and components on Alibaba Cloud and the migration progress of these resources will be stored in this project.

Creating a Migration Project

- Step 1** Sign in to the **MgC** console.
- Step 2** In the navigation pane on the left, choose **Settings**. Under **Migration Projects**, click **Create Project**.



Step 3 In the displayed dialog box, enter a project name, select a project type, and click **Confirm**. The project is created and you can view it in the migration project list.



----End

Modifying a Migration Project

Step 1 Locate the project and click **Modify** in the **Operation** column.

Step 2 In the displayed dialog box, modify the project name, project description, start time, and end time, and click **Confirm**.

✕

Modify Project

* Project Name

Project Description
0/255

Start Time

End Time

Confirm
Cancel

----End

Archiving a Migration Project

Archived projects will not be displayed in the migration project drop-down list on the top of the page. Locate the project and click **Archive** in the **Operation** column to archive the project. If you want to display an archived project in the drop-down list, you need to unarchive it first.

Migration Projects		Credentials	
Project Name	Project Description	Created	Start Time/End Time
---	--	Oct 17, 2023 15:45:31 GMT+08:00	--
			Modify Archive

NOTE

The migration project being currently used cannot be archived.

2.2.2 Managing Credentials

Credentials are used by MgC to authenticate your identity during resource discovery and data collection. This section describes how to add credentials required by MgC to discovering cloud resources. To learn how to add credentials required by Edge to discover on-premises resources or required for manually adding resources to MgC, see [Adding Resource Credentials](#).

Supported Authentication Types

Currently, only credentials of public cloud resources can be added. For details about the supported authentication types, see [Table 2-2](#).

Table 2-2 Supported authentication types for public cloud resources

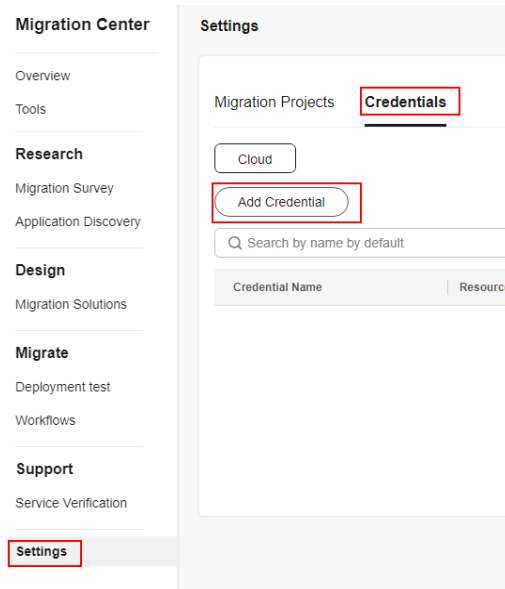
Resource Type	Authentication Type	Description
Public cloud	AK/SK	AK/SK pairs of cloud platforms, such as Huawei Cloud, Alibaba Cloud, AWS, Tencent Cloud, Qiniu Cloud, and Kingsoft Cloud For details about how to obtain AK/SK pairs for cloud platform accounts, see How Do I Obtain Cloud Platform Credentials?
	Configuration file	Credential configuration files of Google Cloud. A configuration file that contains credentials for Google Cloud service accounts can be uploaded to MgC. The file must be in JSON format and cannot exceed 4 KB.
	ID/Secret	Azure credentials. To learn how to obtain Azure credentials, see How Do I Obtain Azure Credentials?

CAUTION

Your cloud credentials are stored in the MgC database and remain valid for seven days. After this period, you need to add the credentials to MgC again if you still want to discover or migrate your cloud resources.

Procedure

- Step 1** Sign in to the **MgC** console.
- Step 2** In the navigation pane on the left, choose **Settings**. Select a **migration project** in the upper left corner of the page.
- Step 3** On the **Credentials** tab, click **Add Credential**.



Step 4 Select a resource type and authentication type as prompted. Specify a credential name, enter or upload your credential, and click **Confirm**.

After the credential is added, you can choose **Credentials > Cloud** to view the added credential.

✕

Add Cloud Platform Credential

* Resource Type

* Type

* Credential Name

* Authentication

* AK

* SK

* Location

----End

2.3 Migration Surveys

2.3.1 TCO Analysis (Credential)

You can share your source cloud credentials, and MgC will analyze your source bills, identify what and how many source resources you used, match the source

resources with Huawei Cloud alternatives, and then compare the cost of your source environment with the cost on Huawei Cloud.

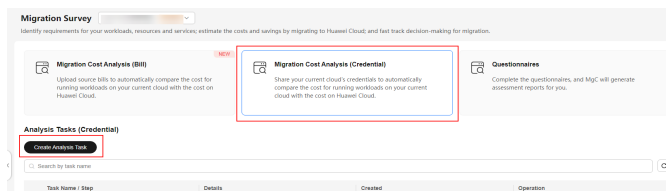
The supported source clouds include **AWS** and **Alibaba Cloud**.

NOTICE

A maximum of 9,999 servers can be included in an analysis task.

Creating an Analysis Task

- Step 1** Sign in to the **MgC** console.
- Step 2** In the navigation pane on the left, choose **Research > Surveys**. Select a **migration project** in the upper left corner of the page.
- Step 3** Click the **TCO Analysis (Credential)** card and then click **Create Analysis Task**.



- Step 4** Configure the parameters listed in **Table 2-3**.

The screenshot shows the 'Create Analysis Task' configuration form. It includes the following fields and options:

- Task Name:** A text input field with the placeholder 'Enter a task name'.
- Source:** A dropdown menu for 'Vendor' with 'Select' as the current value.
- Region:** A dropdown menu with the placeholder 'Select a vendor and then a region'.
- Research Method:** Two buttons: 'AK/SK' (highlighted in blue) and 'Form upload'.
- Credentials:** A dropdown menu with 'Select' as the current value.
- Time Range:** A date range selector with the placeholder 'Start month - End month'.
- Products:** A dropdown menu with 'Select' as the current value.

At the bottom of the form, there are 'Cancel' and 'Confirm' buttons.

Table 2-3 Parameters required for creating an analysis task

Parameter	Description
Task Name	Enter a task name.
Vendor	Select the source cloud vendor. NOTE Currently, AWS and Alibaba Cloud can be chosen.

Parameter	Description
Region	Select the region where your source resources are located.
Research Method	<ul style="list-style-type: none"> If you select AK/SK, specify Credential, Time Range, and Products. If you have not added the source cloud credential to MgC, add it by choosing Create from the credential drop-down list. Configure the parameters for adding a credential and click Verify and Save. <p>NOTE</p> <ul style="list-style-type: none"> Enter the AK/SK pair of the source cloud account when you add the credential to MgC. The source account must have read-only permissions. Fees for API requests may be incurred. <ul style="list-style-type: none"> If you select Form upload, download the template, fill it out, and upload the file. <p>NOTICE</p> <p>A maximum of 9,999 servers can be contained in the file.</p>
Target Region	Select the region you want to migrate to.

Step 5 Click **Confirm**.

After the task is submitted, it will be displayed in credential-based analysis task list. You can click the task name to view the task progress. After the task is finished, you can [download bills](#), [view product mappings](#), and [obtain analysis results](#) for further analysis.

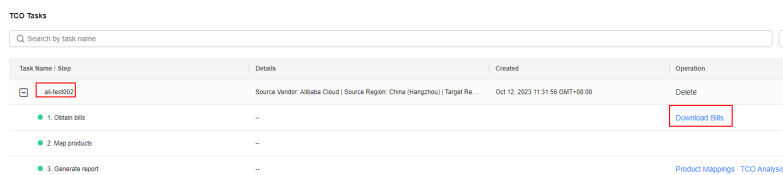
----End

Downloading Bills

MgC analyzes your source bills for the specified period; identifies the billing items; and obtains the specifications, monthly usage, and monthly consumption of each product you used. You can download your bills after the analysis is finished.

Step 1 In the credential-based analysis task list, click the task name.

Step 2 Click **Download Bills** in the **Operation** column. The bills will be downloaded as an Excel file.



----End

Viewing Product Mappings


MgC automatically recommends Huawei Cloud alternatives based on the specifications and usage of source resources. The recommendations prioritize cost-effectiveness while maintaining the current specifications.

You can view the product mapping details and adjust the mappings as needed.

Step 1 In the credential-based analysis task list, click the task name.

Step 2 Click **Product Mappings** in the **Operation** column.

Task Name / Step	Details	Created	Operation
ali-test02	Source Vendor: Alibaba Cloud Source Region: China (Hangzhou) Target Re...	Oct 12, 2023 11:31:56 GMT+08:00	Delete
1. Obtain bills	--		Download Bills
2. Map products	--		
3. Generate report	--		Product Mappings TCO Analysis

Step 3 Click  on the left of a resource type to view the mapping details.

NOTE

- Mapping refers to the aligning of source products to target products.
- Standard mapping means a source product is mapped to the equivalent Huawei Cloud product.
- Non-standard mapping means a source product is mapped to a Huawei Cloud product that is closest to the source product. You can change the mapping if needed.

----End

Viewing Analysis Results

You can view how much you would save if you migrate to Huawei Cloud.

You can also compare the average monthly costs of a certain type of resource between the source cloud vendor and Huawei Cloud. In addition, you can get discounts for each type of resource from your sales manager to save more money on Huawei Cloud.

Step 1 In the credential-based analysis task list, click the task name.

Step 2 Click **TCO Analysis** in the **Operation** column.

Task Name / Step	Details	Created	Operation
ali-test02	Source Vendor: Alibaba Cloud Source Region: China (Hangzhou) Target Re...	Oct 12, 2023 11:31:56 GMT+08:00	Delete
1. Obtain bills	--		Download Bills
2. Map products	--		
3. Generate report	--		Product Mappings TCO Analysis

Step 3 View **Analysis Details** and **Price Differences**, and adjust the estimated costs of Huawei Cloud resources based on the discounts you got.

Click **Export Report** in the upper right corner. The analysis report will be exported to a PDF file.

----End

2.3.2 TCO Analysis (Bill)

You can upload your source bills to MgC, and it will analyze the bills, identify what and how many source resources you used, match the source resources with Huawei Cloud alternatives, and then compare the cost of your source environment with the cost on Huawei Cloud.

Notes and Constraints

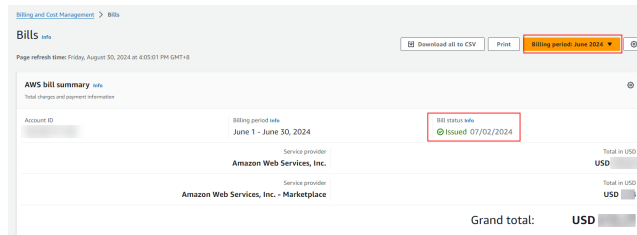
- The supported source cloud is AWS.
- The system can map 17 AWS products such as EC2, RDS, and S3 to Huawei Cloud alternatives. Any products not supported will be excluded from the analysis.
 - Amazon EC2 (Compute)
 - Amazon EC2 (EBS)
 - Amazon EC2 (NAT Gateway)
 - Amazon RDS (MySQL)
 - Amazon RDS (Aurora MySQL)
 - Amazon EKS (Fargate)
 - Amazon ECS (Fargate)
 - Amazon Data Transfer
 - Amazon VPC (VPN)
 - Amazon VPC (VPCEP)
 - Amazon ElastiCache
 - Amazon DocumentDB
 - Amazon ELB
 - Amazon S3
 - Amazon DynamoDB
 - Amazon CloudWatch
 - Amazon ECR
- A maximum of 100 analysis tasks can be created in each MgC migration project, and the task names must be unique.
- The bill file to be uploaded must meet the following requirements:
 - The file must be a PDF file in English or Portuguese. Image PDF files are not supported.
 - The file size cannot exceed 50 MB.
 - The file name cannot contain spaces.

Preparations

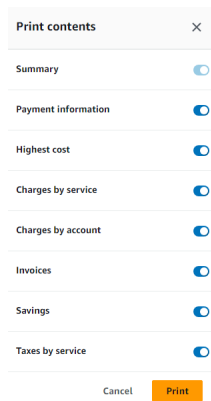
- **Create a migration project.**

On the MgC console, create a migration project. For details, see [Managing Migration Projects](#).
- **Download AWS bills.**
 - a. Open the [AWS Billing and Cost Management console](#).

- b. On the **Bills** page, select the month for **Billing period**. Under the AWS bill summary section, confirm that the **Bill status** appears as **Issued**.



- c. Click **Print** in the upper right corner of the page, select the content to be printed, and click **Print**. **Highest cost** and **Charges by service** are mandatory.



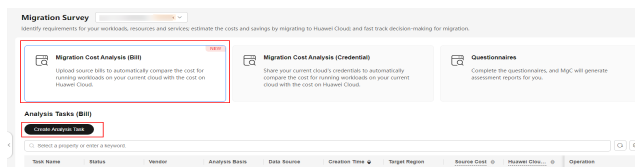
- d. In the displayed dialog box, select **Save as PDF** and click **Save**.

Creating an Analysis Task

Step 1 Sign in to the **MgC console**.

Step 2 In the navigation pane on the left, choose **Research > Surveys**. In the upper left corner of the page, select the migration project created in **Preparations**.

Step 3 Click the **TCO Analysis (Bill)** card and click **Create Analysis Task**. If you are using this function for the first time, you need to delegate MgC certain permission. After you agree to the authorization, the **Create Analysis Task** page is displayed on the right.



Step 4 Enter a task name, select the region you want to migrate to, and click **Select File** to upload the exported bill file to MgC.

Step 5 Click **Confirm**. After the task is submitted, you can view the task status, total source cost, and total Huawei Cloud cost.

Cloud Migration Cost Analysis (Bill) Task List

Task Name	Status	Vendor	Analysis Method	Data Source	Creation Time	Target Region	Source Cost	Huawei Cloud C.	Operation
	Completed	AWS	Bill		Aug 28, 2024 15:3...		\$2,000,000	\$1,000,000	Export Delete

When the task status changes to **Completed**, you can perform the following operations:

- **View product mappings.** You can view what and how many source products you used, whether there are Huawei Cloud alternatives, and what are the alternatives.
- **Modifying product mappings:** You can manually modify the product mappings.
- **Configuring discount assumptions** to adjust the prices of Huawei Cloud alternatives and further optimize the cost on Huawei Cloud.
- **Export cost analysis results.** You can download the analysis results to your local PC for manual adjustment and analysis.

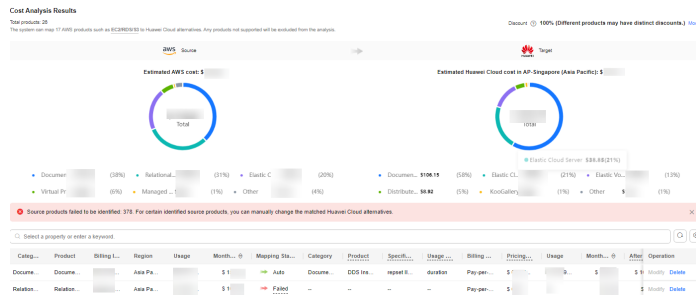
----End

Viewing Product Mappings

After the cost analysis task is complete, you can view the types and quantities of all products identified from the source bills, whether there are Huawei Cloud alternatives, and what are the alternatives.

In the bill-based analysis task list, click the task name in the **Task Name** column. On the task details page, view the product mapping details.

Figure 2-2 Viewing product mappings

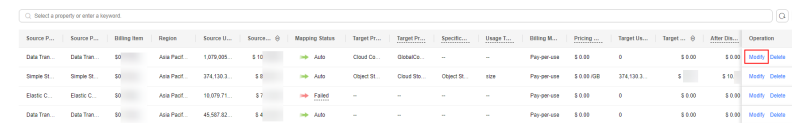


Modifying Product Mappings

Regardless of whether the system finds target products that match source products, you can manually configure target resource configurations, such as the type, specifications, and usage. This helps more accurately estimate the monthly cost of running workloads on the target platform.

- Step 1** In the bill-based analysis task list, click the task name in the **Task Name** column.
- Step 2** In the product mapping list, click **Modify** in the **Operation** column.

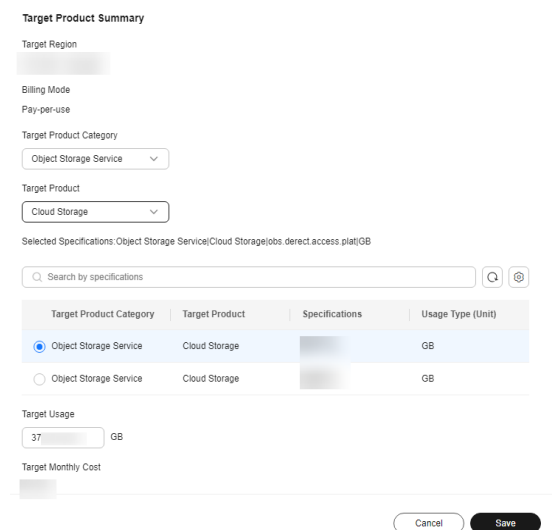
Figure 2-3 Modifying product mappings



- Step 3** In the **Target Product Summary** area, select the category, product, and specifications as required. The system will recalculate the monthly cost based on your modification.

After confirming your modifications, click **Save**.

Figure 2-4 Modifying target resource configurations



----End

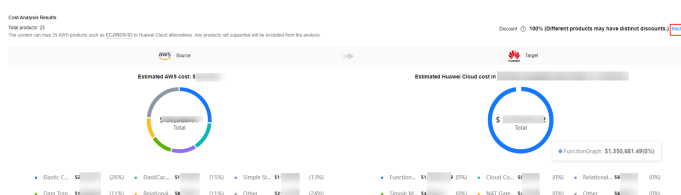
Configuring Discount Assumptions

You can configure discount assumptions for individual Huawei Cloud products to save more money. For more detailed information on available discounts, you can contact the Huawei Cloud commercial representative.

Step 1 In the bill-based analysis task list, click the task name in the **Task Name** column.

Step 2 In the upper right corner of the page, click **Modify** next to **Discount**.

Figure 2-5 Modifying discount assumptions



Step 3 Adjust the discount of each product based on the actual discount obtained from the Huawei Cloud commercial representative. You can configure the following two parameters to modify the discount for all products in a batch or one by one.

- **Discount for All:** This option is used to configure a discount for all products in a batch. You can then adjust the discount individually for each product as needed.
- **Product Discounts:** You can configure a discount for each product separately. Your settings will not change **Discount for All**. Individual product discounts are factored in the cost calculations.

Step 4 After setting the discounts for all products, click **Save**. Then the system calculates the cost of running on Huawei Cloud based on the discounts you set.

----End

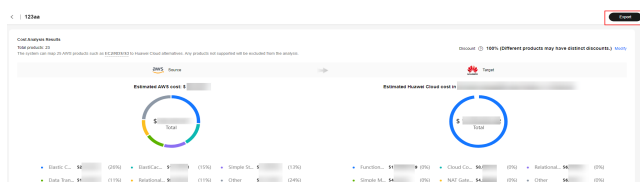
Exporting Cost Analysis Results

After a cost analysis task is complete, you can download the analysis results to your local PC for manual adjustment and analysis.

- **Method 1:** In the bill-based analysis task list, locate the task and click **Export** in the **Operation** column. Then the analysis results will be downloaded as an Excel file.



- **Method 2:** On the task details page, click **Export** in the upper right corner of the page. Then the analysis results will be downloaded as an Excel file.



2.3.3 Questionnaires

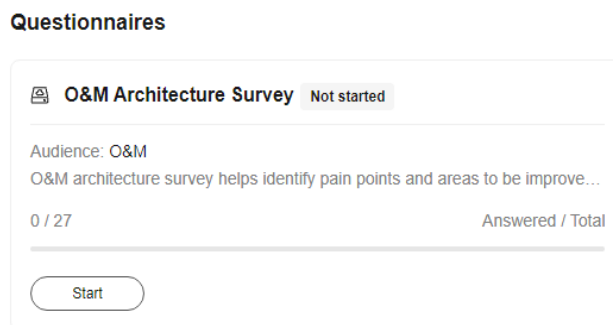
Overview

By completing the questionnaires crafted from years of Huawei Cloud expertise, you can organize your source architecture and resources.

O&M Architecture Survey

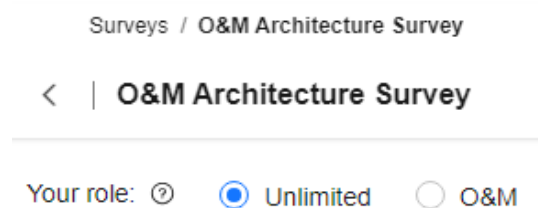
- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane on the left, choose **Research > Surveys**. Select a [migration project](#) in the upper left corner of the page.
- Step 3** Select the **Questionnaires** box. In the **O&M Architecture Survey** area, click **Start**.

Figure 2-6 Starting a survey



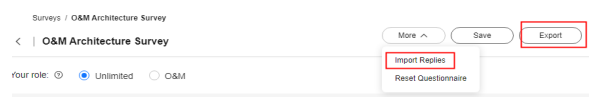
- Step 4** Select your role. Your role determines what questions you will be asked.

Figure 2-7 Selecting a role



- Step 5** Answer all questions in the questionnaire in sequence. You can refer to the answer example on the right of the page. If you have any questions or need suggestions from the professional team, click **Export** in the upper right corner of the page to export the questionnaire. Consult the team, input their suggestions, and import the questionnaire back.

Figure 2-8 Exporting and importing a questionnaire



Step 6 After confirming the answers to all questions, click **Save** in the upper right corner of the page.

----End

2.3.4 Storage Migration Cost Survey

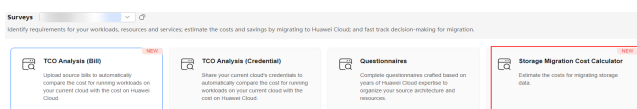
You can estimate the costs and time required to migrate your storage data to Huawei Cloud based on the size and number of files to be migrated. MgC will calculate the necessary migration cluster size and network bandwidth. This allows you to choose a migration solution that fits your needs and budget.

Procedure

Step 1 Sign in to the [MgC console](#).

Step 2 In the navigation pane on the left, choose **Research > Surveys**. Select a **migration project** in the upper left corner of the page.

Step 3 Click the **Storage Migration Cost Survey** box.



Step 4 In the **Source** area, select the source platform and source type, and enter the number of source files and total file size.

Step 5 In the **Target** area, select the target region and storage type.

Step 6 In the **Advanced Settings** area, select a network type, set preferences, and enter the desired migration time.

Step 7 Click **Estimate**. The system will provide different migration solutions based on the settings.

----End

2.4 Resource Discovery

2.4.1 Complex Project

2.4.1.1 Discovering Resources over the Internet

Before migrating, you need to discover your resources and collect their details. This section describes how to discover resources provisioned on cloud platforms such as Alibaba Cloud, Huawei Cloud, AWS, Tencent Cloud, Google Cloud, Azure, Qiniu Cloud, and Kingsoft Cloud over the Internet. Then you can organize the associations between resources and applications. The resource types supported by MgC depend on the source cloud platform.

- Alibaba Cloud and Huawei Cloud: servers, containers, middleware, databases, networks, and storage

- Tencent Cloud: servers, databases, and storage
- AWS, Google Cloud, and Azure: servers, containers, middleware, databases, storage, and networks
- Qiniu Cloud and Kingsoft Cloud: object storage

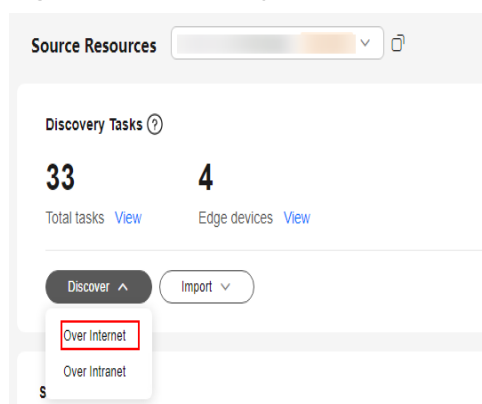
Creating a Discovery Task

Step 1 Sign in to the **MgC console**.

Step 2 In the navigation pane on the left, choose **Research > Source Resources**. Select a **migration project** in the upper left corner of the page.

Step 3 In the **Discovery Tasks** card, choose **Discover > Over Internet**.

Figure 2-9 Discovery over Internet



Step 4 Configure the parameters listed in **Table 2-4**.

Table 2-4 Parameters for creating an Internet-based discovery task

Area	Parameter	Description	Mandatory
Basic Settings	Task Name	Specify a name for the task.	Yes
	Task Description	Describe the task.	No
Task Settings	Source Platform	Select the source cloud platform. Currently, Alibaba Cloud, Huawei Cloud, AWS, Tencent Cloud, Google Cloud, Azure, Qiniu Cloud, and Kingsoft Cloud are supported.	Yes

Area	Parameter	Description	Mandatory
	Credential	<p>Select the credential for accessing the source cloud platform. If no credential is available, choose Create to add one. For details, see Managing Credentials.</p> <ul style="list-style-type: none"> • If the source cloud platform is Alibaba Cloud, Huawei Cloud, AWS, Tencent Cloud, Qiniu Cloud, or Kingsoft Cloud, select AK/SK for Authentication and enter the AK/SK pair of your source cloud account. • If the source cloud platform is Google Cloud, select Configuration File for Authentication and upload the configuration file that contains your Google Cloud service account credentials. The file must be in JSON format and cannot exceed 4 KB. • If the source cloud platform is Azure, Select ID/Secret for Authentication. To learn how to obtain Azure credentials, see How Do I Obtain Azure Credentials? 	Yes
	Region	Select the region where your source environment is located. Multiple regions can be selected.	Yes

Step 5 Enable **Cloud Platform Collection**, choose the resource types (collection items) to be collected from the **Resource Type** drop-down list. For resource types supported for each cloud platform, see [Table 2-5](#).

Figure 2-10 Selecting resource types

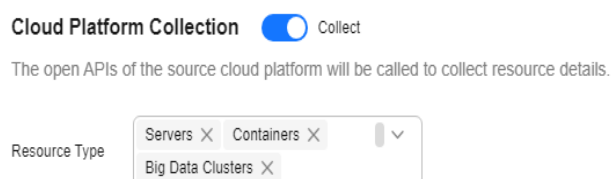


Table 2-5 Supported resource types

Cloud Platform	Resource Type	Subtype
Alibaba Cloud	<ul style="list-style-type: none"> • Servers • Containers • Big data clusters • Databases 	-
	Middleware	<ul style="list-style-type: none"> • Redis • Kafka
	Storage	<ul style="list-style-type: none"> • Object storage • File storage
	Networks	<ul style="list-style-type: none"> • Cloud connections • Load balancers (ALB and CLB) • Private lines • Public domain names • Private domain names • EIPs • Public NAT gateways • Route tables • Security groups • VPCs • VPN gateways
Huawei Cloud	<ul style="list-style-type: none"> • Servers • Containers • Big data clusters • Databases 	-
	Middleware	<ul style="list-style-type: none"> • Redis • Kafka
	Storage	<ul style="list-style-type: none"> • Object storage • File storage
	Networks	<ul style="list-style-type: none"> • Load balancers (ELB) • Public domain names • Private domain names • EIPs • Public NAT gateways • Route tables • Security groups • VPCs

Cloud Platform	Resource Type	Subtype
AWS	<ul style="list-style-type: none"> • Servers • Containers • Databases 	-
	Middleware	<ul style="list-style-type: none"> • Redis • Kafka
	Networks	<ul style="list-style-type: none"> • Load balancers (ELB) (Currently, only CLB balancers are supported.) • Public domain names • Private domain names • EIPs • Public NAT gateways • Route tables • Security groups • VPCs
	Storage	<ul style="list-style-type: none"> • Object storage • File storage
Tencent Cloud	<ul style="list-style-type: none"> • Servers • Databases 	-
	Storage	<ul style="list-style-type: none"> • Object storage • File storage
Google Cloud	<ul style="list-style-type: none"> • Servers • Containers • Databases 	-
	Middleware	Redis
	Storage	<ul style="list-style-type: none"> • Object storage • File storage
	Networks	<ul style="list-style-type: none"> • EIPs • Route tables • Security groups • VPCs
Azure	<ul style="list-style-type: none"> • Servers • Containers • Databases 	-
	Storage	<ul style="list-style-type: none"> • Object storage • File storage

Cloud Platform	Resource Type	Subtype
	Middleware	<ul style="list-style-type: none"> • Redis • Kafka
	Networks	<ul style="list-style-type: none"> • EIPs • Route tables • Security groups • Public NAT gateways • VPCs • Load balancers
Qiniu Cloud	Storage	Object storage
Kingsoft Cloud	Storage	Object storage

Step 6 (Optional) In the **Application Discovery** area, select the collection items to identify invocation chains between resources and applications and map application dependencies.

NOTICE

Before selecting a collection item, ensure that the account of the provided credential has the permissions for accessing the collection item.

The following table lists what information each collection item can provides.

Collection Item	Function
Resource Management	Collecting data from this service helps you find out how different applications and resources are connected, which helps prevent disruptions in their relationships.
DNS	Collecting DNS data helps gain insights into how different applications interact at the access layer.
WAF	Collecting WAF data helps gain insights into application traffic flows.
LB	Collecting LB data helps gain insights into applications traffic flows.
MSE	Collecting MSE data helps analyze how different applications and microservices interact.

- Step 7** Click **Confirm**. After this Internet-based discovery task is created, MgC starts discovering details about resources and applications.
- You can [view the list and details of discovered resources](#) on the **Resource** page.
 - You can [view the task status and details](#) on the task list page.
- Step 8** Wait until the task status changes to **Succeeded**. Then perform subsequent operations for different types of resources.
- For discovered servers, [perform a deep collection](#) or [check their migration readiness](#) and then design a [migration solution](#) or [migration plan](#).
 - For discovered containers, [perform a deep collection](#) and [design a migration solution](#).
 - For discovered middleware, databases, and storage resources, [design migration solutions](#). [Deep collection](#) is available for AWS RDS (for MySQL, MariaDB, Aurora, PostgreSQL, SQL Server, and Oracle) and AWS DocumentDB databases.
 - For discovered object storage resources, perform a [deep collection](#) and configure a [migration plan](#).

----End

Check Migration Readiness for Servers

Perform the following steps to check whether your source servers meet the migration requirements:

- [Install Edge](#) in the source intranet environment and connect Edge to MgC.
- In the **Resources** area, click **Server** in the **Category** column or the number in the **Total Resources** column.

Source Resources

Category	Total Resources
Server	370
Container	12
<input type="checkbox"/> Middleware	2 <input type="checkbox"/>
Database	3
Big Data	0
<input type="checkbox"/> Network	542 <input type="checkbox"/>
<input type="checkbox"/> Storage	166 <input type="checkbox"/>

- Select the servers to migrate together and click **Group as Application** above the list.
 - If you have [created an application](#), select the application from the drop-down list and click **OK**.
 - If you have not created an application, click **Create Application** in the displayed dialog box. Then enter an application name and description, select a business scenario, environment, and target region, and click **Create**. Then click **OK**.
- On the top of the server list, choose **Migration Scenario > Server migration**.
- For each source server, click **Configure** in the **Migration Readiness** column.

6. Configure the parameters listed in [Table 2-6](#).

Table 2-6 Parameters for configuring migration readiness

Parameter	Configuration
Type	Set this parameter based on the source server OS type.
Edge Device	Select the Edge device in the source environment.
Access IP Address	Select the IP address for accessing the source server. It can be a public or private IP address. After the pre-migration check is passed, the IP address you select here will be used for migration.
Port	Enter the port on the source server that allows access from the Edge device. <ul style="list-style-type: none">• By default, port 5985 on Windows source servers must be opened to the Edge device. The port cannot be changed.• By default, port 22 on Linux source servers must be opened to the Edge device. You can specify a different port if needed.
Credential	Select the server credential. If the credential has not been added to MgC, go to the Edge console, add the server credential to Edge, and synchronize it to MgC. NOTICE The account provided in the credential must have sufficient permissions, so Edge can collect necessary server details. To perform a deep collection for the server to collect as much as details, the credential you provided must meet the following requirements: <ul style="list-style-type: none">• Linux: root and its password• Windows: administrator and its password

7. Click **Confirm**. The system checks whether the source server can be accessed using the information you provided and whether the server can be migrated. If **Ready** shows up in the **Migration Readiness** column, the source server can be migrated. Then you can [design a migration solution](#) or [design a migration plan](#) to migrate the server.

Performing a Deep Collection for Servers

Perform the following steps to perform a deep collection for your source servers:

1. Ensure that [Edge](#) has been installed in the source intranet environment and has been connected to MgC.
2. In the **Resources** area, click **Server** in the **Category** column or the number in the **Total Resources** column.
3. For each server whose details need to be collected, in the **Edge Device** column, click **Configure**. Configure the parameters listed in [Table 2-7](#).

Table 2-7 Parameters for configuring a deep collection

Parameter	Configuration
Type	Set this parameter based on the source server OS type.
Edge Device	Select the Edge device in the source environment.
Access IP Address	Select the IP address for accessing the source server. It can be a public or private IP address. After the pre-migration check is passed, the IP address you select here will be used for migration.
Port	Enter the port on the source server that allows access from the Edge device. <ul style="list-style-type: none">• By default, port 5985 on Windows source servers must be opened to the Edge device. The port cannot be changed.• By default, port 22 on Linux source servers must be opened to the Edge device. You can specify a different port if needed.
Credential	Select the server credential. If the credential has not been added to MgC, go to the Edge console, add the server credential to Edge, and synchronize it to MgC. NOTICE The account provided in the credential must have sufficient permissions, so Edge can collect necessary server details. To perform a deep collection for the server to collect as much as details, the credential you provided must meet the following requirements: <ul style="list-style-type: none">• Linux: root and its password• Windows: administrator and its password

4. Click **Confirm**. Then the system automatically starts executing a deep collection. When **Collected** shows up in the **Deep Collection** column, the collection is complete. You can **design a migration solution** or **design a migration plan** to migrate your servers.

Performing a Deep Collection for Containers

Perform the following steps to perform a deep collection for your containers:

1. Ensure that **Edge** has been installed in the source intranet environment and has been connected to MgC.
2. In the **Resources** area, click **Container** in the **Category** column or the number in the **Total Resources** column.
3. For each container resource whose details need to be collected, click **Associate** in the **Edge Device** column.
To associate multiple container resources with one Edge device, select them and choose **Manage Device Association** above the list.
4. Select the Edge device in the source environment and click **OK**. Wait until **Associated** appears in the **Edge Device** column.

5. For each container resource, in the **Credential** column, click **Associate** to configure their credentials.
6. Select the resource credential. If the credential has not been added to MgC, go to the Edge console, [add the credential](#) to Edge, and synchronize it to MgC.
7. Click **OK**. Then MgC checks whether the resource can be accessed using the associated credential. When **Ready** appears in the **Deep Collection** column, click **Collect** to perform a deep collection. You can click **Collect Again** in the **Deep Collection** column to perform a second deep collection if needed. After the collection is complete, click the resource name to view the collected details.

Performing a Deep Collection for Object Storage Resources

Follow the steps below to perform a deep collection for your object storage resources, so the system can use the collected details to recommend rightsized migration clusters.

1. Ensure that [Edge](#) has been installed in the source intranet environment and has been registered with MgC.
2. On the **Resource Discovery** page, in the **Resources** area, click **Storage** in the **Category** column or the number in the **Total Resources** column.
3. Locate an object storage resource and click **Configure** in the **Deep Collection** column.
4. Select the Edge device in the source environment and the credential used for accessing the resource, and click **Confirm**. If the credential has not been added to MgC, go to the Edge console and [add the resource credential](#) to Edge and synchronize it to MgC.

NOTICE

To perform a deep collection for your Azure object storage resources, you need to provide your storage account and access key. For details about how to obtain the credentials, see [How Do I Obtain the Required Credentials Before Using MgC to Perform a Deep Collection for My Azure Object Storage Resources?](#)

5. Click **Add Prefix** in the **Operation** column.
6. Enter a prefix to filter the objects whose details need to be collected. If this parameter is not specified, all objects in the bucket are collected by default. Click **OK** to save the prefix settings.
7. Click **Deep Collection** in the **Operation** column. The system starts collecting path details. You can perform a deep collection on a resource for multiple times. When **Collection Status** changes to **Completed**, click the resource name to view the collected information.

Performing a Deep Collection for Databases

Deep collection is available for AWS RDS (for MySQL, MariaDB, Aurora, PostgreSQL, SQL Server, and Oracle) and AWS DocumentDB databases. The data

collected includes database version, engine, server character set, average transactions per second (TPS), and queries per second (QPS), and other key performance metrics (KPIs). The collected data depends on the database type.

1. Ensure that **Edge** has been installed in the source intranet environment, can access source databases, and has been registered with MgC.
2. On the **Resource Discovery** page, in the **Resources** area, click **Database** in the **Category** column or the number in the **Total Resources** column.
3. In the database list, filter all discovered AWS databases by applying the **Vendor** filter. Locate a supported database and in the **Edge Device** column, click **Associate**.

To associate multiple databases with one Edge device, select them and choose **Manage Device Association** above the list.

4. Select your Edge device. For **Access Setting**, if the selected resource is in the same VPC as the Edge device, select **Private access**. Otherwise, select **Public access**. Then click **OK**. Wait until **Associated** appears in the **Edge Device** column.
5. In the **Credential** column, click **Associate** to associate the credential for accessing the resource.
6. Select the database credential. If the credential has not been added to MgC, go to the Edge console, **add the credential** to Edge, and synchronize it to MgC.
7. Click **OK**. Then MgC checks whether the resource can be accessed using the associated credential. When **Ready** appears in the **Deep Collection** column, click **Collect** to perform a deep collection. You can click **Collect** in the **Deep Collection** column to perform a deep collection again if needed.
8. Wait for the deep collection to complete. Then click the database name to go to the database details page. In the **Database Information** area, you can view the collected details.

Viewing Discovered Source Resources

A discovery task can collect only basic information about source resources. More detailed information needs to be collected through a deep collection.

1. On the **Resource Discovery** page, in the **Resources** area, view the number of discovered resources by category and the number of resources that are not associated with applications.

Figure 2-11 Viewing the resource list

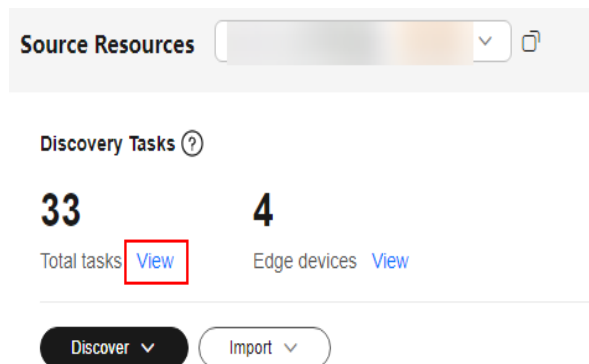
Category	Total Resources	Unassociated Resources
Server	370	142
Container	12	0
Middleware	2	2
Database	3	1
Big Data	0	0
Network	542	542
Storage	166	163

2. Click a resource category or number to view the resource list.
3. Click a resource name to view its details.

Viewing Discovery Tasks

Step 1 On the **Resource Discovery** page, click **View** next to **Total tasks** to go to the task list.

Figure 2-12 Viewing the task list



Step 2 Locate a discovery task, and click **View** in the **Operation** column.


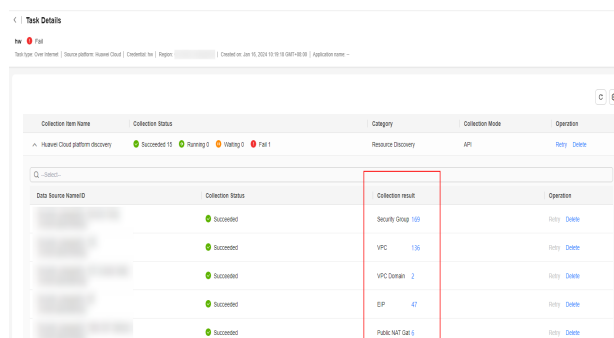
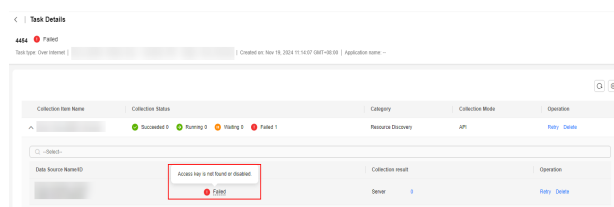
Step 3 Click  before a collection item to view the data sources contained in the collection item and the collection results.

Figure 2-13 Viewing collection results



If a data source fails to be collected, you can move the cursor to the collection status of the data source to view the failure cause.



Step 4 In the **Collection Result** column, you can click the number next to a resource category to view the corresponding resource list.

----End

2.4.1.2 Discovering Resources over an Intranet

This section describes how to discover servers in on-premises environments. Before getting started, you need to install Edge in the source intranet. Then you can discover servers by network range or VMware host.

Precautions

- Only VMs in VMware vSphere 5.0 to 7.0 can be discovered.
- When the system scans VMware VMs or scans servers on specified network ranges, it uses the servers' private IP addresses and the ID of the used Edge device to identify discovered servers. If a server's private IP address changes after a collection is complete, the server will be identified as a new one during the next collection, and the total number of discovered servers will increase. To avoid this, you are advised not to change private IP addresses of source servers before the migration is complete.

Prerequisites

- You have [installed Edge](#) in the source intranet environment and have connected the Edge device to MgC.
- You have [added source server credentials](#) to Edge.

NOTICE

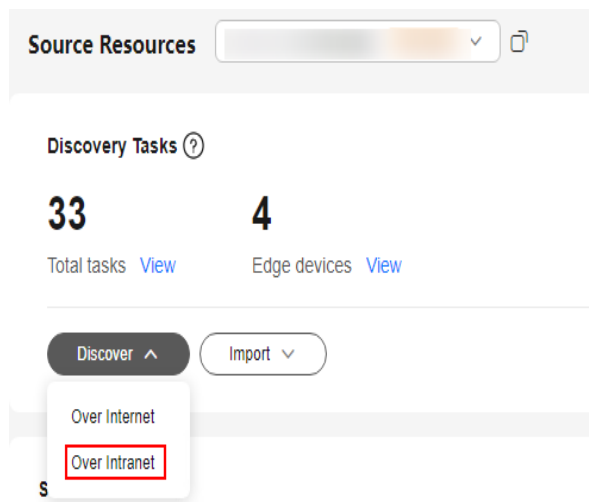
To perform a deep collection for your source servers to collect as much as details, provide server credentials that meet the following requirements:

- Linux: **root** and its password
 - Windows: **administrator** and its password
-

Procedure

- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane on the left, choose **Research > Source Resources**. Select a [migration project](#) in the upper left corner of the page.
- Step 3** In the **Discovery Tasks** card, choose **Discover > Over Intranet**.

Figure 2-14 Discovery over an intranet



Step 4 Configure the parameters listed in [Table 2-8](#).

Table 2-8 Parameters for creating an intranet-based discovery task

Parameter	Description
Task Name	Enter a task name.
Task Description	Describe the task.
Edge Device	Select the Edge device in the source intranet environment.

Step 5 Enable **Scan Network Range** or **Scan VMware VMs** to discover servers as needed.

- If **Scan Network Range** is enabled, configure parameters listed in [Table 2-9](#).

Table 2-9 Parameters for scanning a network range

Parameter	Description
Protocol	Select the communication protocol TCP or ICMP .
Network Range	Enter an IP address range which must fall within: <ul style="list-style-type: none"> - 10.0.0.0 - 10.255.255.255 - 172.16.0.0 - 172.31.255.255 - 192.168.0.0 - 192.168.255.255
Linux	Enter the port for scanning Linux servers. This parameter is available only if you choose the TCP protocol. If you need to skip Linux servers during the scan, set this parameter to 0 .

Parameter	Description
Windows	Enter the port for scanning Windows servers. This parameter is available only if you choose the TCP protocol. If you need to skip Windows servers during the scan, set this parameter to 0 .

- If **Scan VMware VMs** is enabled, in the **IP Address** text box, enter the IP address of the vCenter Server where the VMs will be discovered, and select the credential for accessing the vCenter Server. All VMs managed by the vCenter Server will be discovered. If the vCenter Server's credential has not been added to Edge, **add the resource** to Edge. When adding the credential, enter the username and password for logging in to the vCenter Server.

Step 6 Click **Confirm**. The intranet-based discovery task is created, and MgC starts collecting details about source servers.

On the **Source Resources** page, in the **Discovery Tasks** card, click **View** next to **Total tasks**.

Step 7 Wait until the task status changes to **Succeeded**, and perform a deep collection.

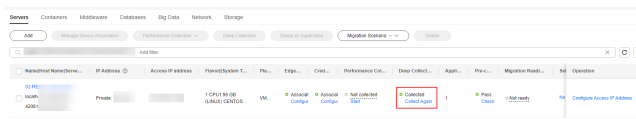
1. On the **Source Resources** page, in the resource list, click **Server** in the **Category** column or the number in the **Total Resources** column.
2. In the **Edge Device** or **Credential** column, click **Configure**.
3. Configure the parameters listed in **Table 2-10**.

Table 2-10 Parameters for configuring a deep collection

Parameter	Configuration
Type	Set this parameter based on the source server OS type.
Edge Device	Select the Edge device in the source environment.
Access IP Address	Select the IP address for accessing the source server. It can be a public or private IP address. After the pre-migration check is passed, the IP address you select here will be used for migration.
Port	Enter the port on the source server that allows access from the Edge device. <ul style="list-style-type: none"> – By default, port 5985 on Windows source servers must be opened to the Edge device. The port cannot be changed. – By default, port 22 on Linux source servers must be opened to the Edge device. You can specify a different port if needed.
Credential	Select the server credential. If the credential has not been added to MgC, go to the Edge console, add the server credential to Edge, and synchronize it to MgC.

4. Click **Confirm**. Then the system automatically starts executing a deep collection. When **Collected** shows up in the **Deep Collection** column, the collection is complete. You can [design a migration solution](#) or [design a migration plan](#) to migrate your servers.

Figure 2-15 Discovery completed



----End

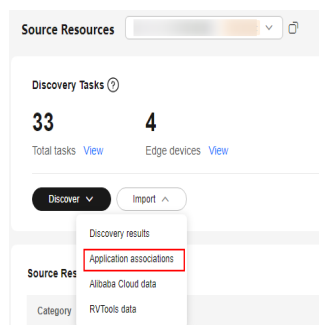
2.4.1.3 Importing Application Associations

You can import application details obtained from the configuration management database in your source environment to MgC. Once imported, MgC will analyze these details to identify application dependencies and associations.

Procedure

- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane on the left, choose **Research > Source Resources**. Select a [migration project](#) in the upper left corner of the page.
- Step 3** In the **Discovery Tasks** card, choose **Import > Application associations**. Download the template for importing application associations.

Figure 2-16 Downloading the template for importing application associations



- Step 4** Populate the template with your application details and save the file. In the file, fields highlighted in yellow are mandatory. Then click **Select File** to upload the saved file to MgC.
- Step 5** Click **Confirm**.

You can view the task in the task list.

- If the task status is **Failed**, click **View** in the **Operation** column to view the data source that failed to be collected. You can move the cursor to the collection status to view the failure cause. After handling the failure cause, you need to delete the failed task and perform a second import.

- If the task status is **Succeeded**, you can go to the **Applications** page to [view the organized application dependencies](#).

----End

2.4.1.4 Importing Discovery Results

You can use offline collectors to discover your resources and applications and collect their details, and import the collected details to MgC for automated application dependency analysis.

Prerequisites

You have [created collection tasks using offline collectors](#) and have obtained the collection results.

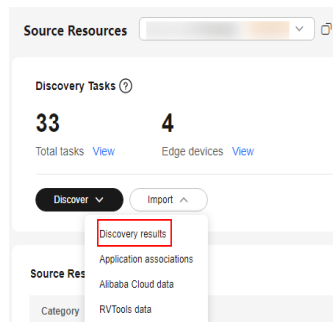
Procedure

Step 1 Sign in to the [MgC console](#).

Step 2 In the navigation pane on the left, choose **Research > Source Resources**. Select a [migration project](#) in the upper left corner of the page.

Step 3 In the **Discovery Tasks** card, choose **Import > Discovery results**.

Figure 2-17 Importing discovery results



Step 4 In the **Import Discovery Results** dialog box, click **Select File** to upload the JSON file that stores the discovery results to MgC.

Step 5 Click **Confirm**.

You can view the task in the task list.

- If the task status is **Failed**, click **View** in the **Operation** column to view the data source that failed to be collected. You can move the cursor to the collection status to view the failure cause. After handling the failure cause, you need to delete the failed task and perform a second import.
- If the task status is **Succeeded**, you can go to the **Applications** page to [view the organized application dependencies](#).

----End

2.4.1.5 Importing Details of Alibaba Cloud Resources

You can import CSV-formatted resource details from Alibaba Cloud directly into MgC. You first need to export the resource details from Alibaba Cloud. After the import is complete, you can view the resource details on the MgC console. With the imported details, you can get recommendations for suitable Huawei Cloud resources.

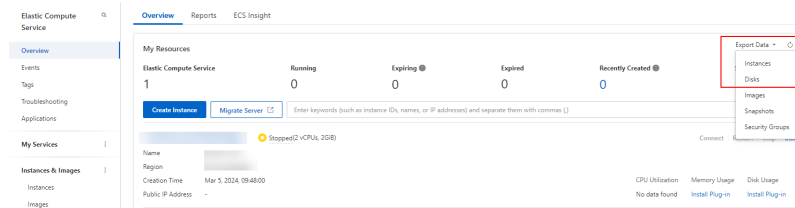
The supported Alibaba Cloud resources are:

- Elastic Compute Service (ECS) instances and cloud disks
- Object Storage Service (OSS) buckets
- ApsaraDB RDS for MySQL instances
- ApsaraDB RDS for GaussDB instances

Exporting Data of Alibaba Cloud ECS Instances and Disks

Step 1 Sign in to the Alibaba Cloud ECS console.

Step 2 On the **Overview** page, choose **Export Data > Instances** to export a list of all ECS instances.



Step 3 Choose **Export Data > Disks** to export a list of all cloud disks.

Step 4 Open the instance list and the disk list and adjust the resource information if needed. Ensure that the lists contain the necessary information.


List	Mandatory Fields
Instance list	Instance ID, OS, instance specifications, CPU, and memory
Disk list	Instance ID, disk ID, capacity (GiB), and disk attributes

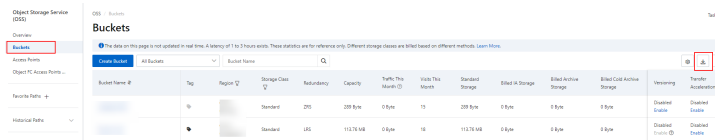
----End

Exporting Data of Alibaba Cloud OSS Buckets

Step 1 Sign in to the OSS console.

Step 2 In the left navigation pane, choose **Buckets**.

Step 3 Click the  icon in the upper right corner of the list. The **Export Bucket List** dialog box is displayed.



Step 4 Select the information to be exported and click **OK**.

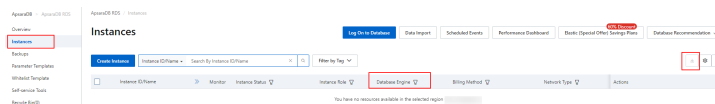
----End

Exporting Data of Alibaba Cloud ApsaraDB RDS for MySQL Instances

Step 1 Sign in to the Alibaba Cloud ApsaraDB RDS for MySQL console.

Step 2 In the navigation pane on the left, choose **Instances**. Select a region in the upper part of the page.

Step 3 Filter all MySQL instances in the **Database Engine** column and click the icon in the upper right corner of the list.



Step 4 In the displayed dialog box, select the information to be exported. Click **OK**. The system exports the instance information to a CSV file and automatically downloads the file.

Step 5 Modify the exported CSV file so MgC can parse the file content.

1. Use a file editor to open the CSV file and search for **PrivatePort(A network port,)** in the table header.
2. Delete the comma (,) from this field and save the file. The correct format is **PrivatePort(A network port)**.

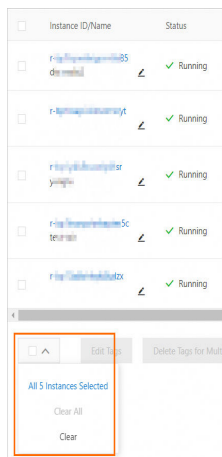
----End


Exporting Data of Alibaba Cloud ApsaraDB RDS for Redis Instances

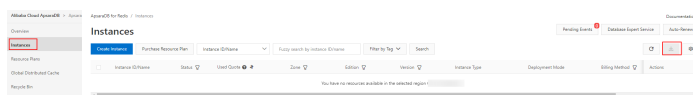
Step 1 Sign in to the Alibaba Cloud ApsaraDB for Redis console.

Step 2 In the navigation pane on the left, choose **Instances**. Select a region in the upper part of the page.

Step 3 In the lower left corner of the page, expand  and click **Select All**.



Step 4 Click the  icon in the upper right corner of the list. In the dialog box that is displayed, select the information to be exported.



Step 5 Click **OK**. The system exports the instance information to a CSV file and automatically downloads the file.

Step 6 Modify the exported CSV file so MgC can parse the file content.

1. Use a file editor to open the CSV file.
2. Add a comma (,) at the end of the table heading line and save the file.

The following shows an example table header before modification:

```
ID,Name,Quantity
```

The following shows the table header after modification:

```
ID,Name,Quantity,
```

----End

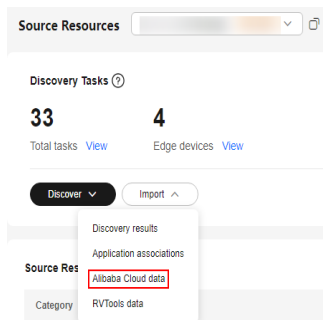
Importing Details of Alibaba Cloud Resources

Step 1 Sign in to the **MgC console**.

Step 2 In the navigation pane on the left, choose **Research > Source Resources**. Select a **migration project** in the upper left corner of the page.

Step 3 In the **Discovery Tasks** card, choose **Import > Alibaba Cloud Data**.

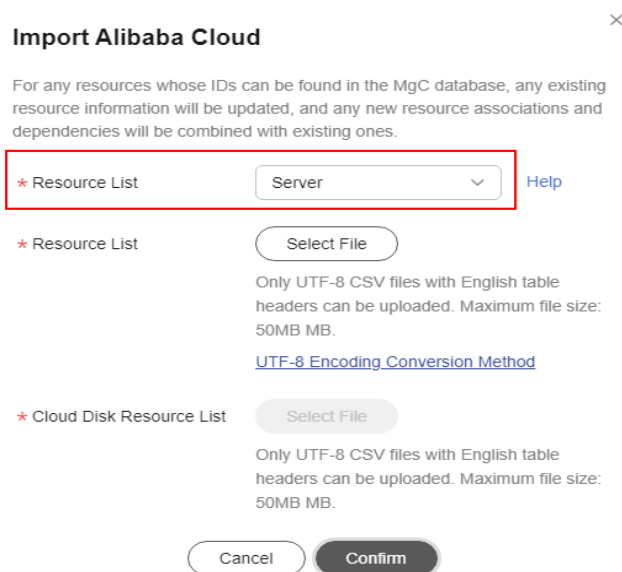
Figure 2-18 Importing details of Alibaba Cloud resources



NOTICE

Only CSV files encoded in UTF-8 format with English table headers can be imported. The size of a single file cannot exceed 15 MB. For details about how to convert the encoding format of a CSV file to UTF-8, see [How Do I Convert the Encoding Format of a CSV File to UTF-8?](#)

Step 4 In the **Resource Type** drop-down list, select the types of resources to be imported and upload the corresponding file.



Resource Type	Procedure
Servers	<ol style="list-style-type: none"> 1. Click Select File next to Resource List and select the exported ECS list. 2. Click Select File next to Cloud Disk List and select the exported disk list.
Redis	Click Select File next to Resource List and select the exported Redis instance list .
Object storage	Click Select File next to Resource List and select the exported OSS bucket list .
Databases	Click Select File next to Resource List and select the exported MySQL instance list .

Step 5 Click **Confirm**. After the resource list is uploaded successfully, select the corresponding resource categories to view the imported resource information.

Step 6 (Optional) Group imported Alibaba Cloud resources as applications. For details, see [Grouping Resources as Applications](#). Then assess the applications to obtain recommendations for Huawei Cloud resources. For details, see [Getting Target Recommendations](#).

----End

2.4.1.6 Importing RVTools Data

Notes and Constraints

- **Supported RVTools versions**

The supported RVTools versions include:

- 4.4.1
- 4.4.2
- 4.4.3
- 4.4.4
- 4.4.5
- 4.5.0
- 4.5.1
- 4.6.1

- **File format requirements**

Only the Excel (.xlsx) format is supported.

- **File size and compression ratio requirements**

The file to be imported cannot be larger than 100 MB, and the compression ratio cannot be lower than 5%.

Step 1: Exporting RVTools Data

Step 1 Start the RVTools application.

Step 2 On the login page, enter the following information:

- In the **IP address/Name** text box, enter IP address of the vCenter server.
- In the **User name** text box, enter the username for connecting to the vCenter server.
- In the **Password** text box, enter the password corresponding to the username.

Step 3 Click **Login**. In the top menu bar, choose **File > Export all to Excel**.

Step 4 Select a path for saving the file that contains details about your resource.

----End

Step 2: Uploading the Exported File to OBS

Step 1 Sign in to Huawei Cloud [OBS console](#) and create a Standard bucket for storing the file exported from RVTools. For details, see [Creating a Bucket](#).

Step 2 Upload the [file exported from RVTools](#) to the Standard OBS bucket. For details, see [Uploading an Object](#).

----End

Step 3: Importing RVTools Data

Step 1 Sign in to the [MgC console](#).

Step 2 In the navigation pane on the left, choose **Research > Source Resources**. Select a **migration project** in the upper left corner of the page.

Step 3 In the **Discovery Tasks** card, choose **Import > RVTools data**.

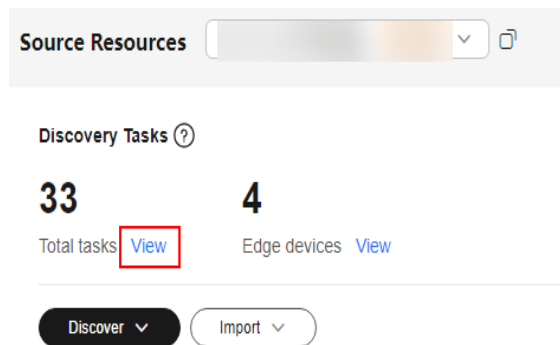


NOTE

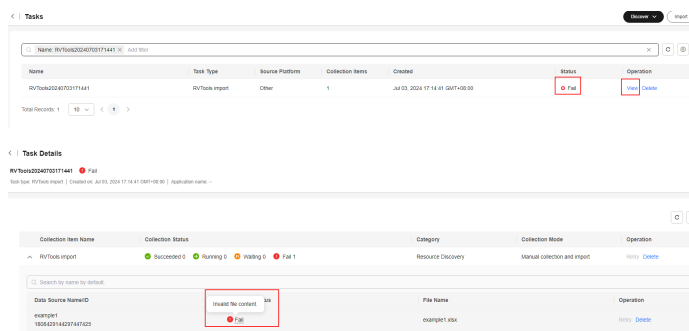
If you are using this function for the first time, click **OK** in the **Authorization Required** dialog box to agree to the agency-based authorization.

Step 4 In the **File** drop-down list, locate the OBS bucket you used to store the file exported from RVTools in **step 2**, select the exported file, and click **Confirm**.

Step 5 After the upload is successful, in the **Discovery Tasks** card, click **View** next to **Total tasks**. In the task list, view the task status.



- If the task status is **Failed**, click **View** in the **Operation** column to view the data source that failed to be collected. You can move the cursor to the collection status to view the failure cause. For details about how to rectify common failure causes, see [What Can I Do If Importing RVTools Data Fails?](#) After handling the failure cause, you need to delete the failed task and perform a second import.



- If the task status is **Succeeded**, you can view the imported **resource details** and **resource statistics**.

----End

Viewing Resource Details

If the status of the RVTools import task is **Succeeded**, you can view the details of VMware servers, including the hostname, server ID, IP address, specifications, OS type, and platform.

- Step 1** On the **Source Resources** page, in the resource list, click **Server** in the **Category** column or the number in the **Total Resources** column.

Source Resources

Category	Total Resources
Server	370
Container	12
Middleware	2
Database	3
Big Data	0
Network	542
Storage	166

- Step 2** In the server list, you can view the imported server information. You can click a resource name to view more details.

The screenshot shows the 'Source Resources' page with a list of servers. One server is selected, and its details are shown in a side panel. The server details include:

- Basic Information:** Platform: VMware, Region: --, Availability Zone: --, Server Name: ASOXP002CLOD, Service Status: Running, Private IP Address: --, Access IP Address: --, Public IP Address: --, VPC: --, Security Group: --.
- Specification Information:** Specifications: 4 CPU/16 GB, CPU Type: --, System Size: LINUX, Image: CentOS 8 (64-bit).

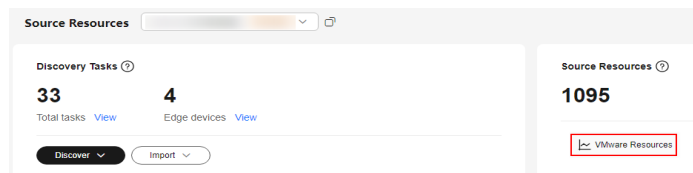
----End

Viewing Resource Statistics

If the status of the RVTools import task is **Succeeded**, you can view the VMware resource statistics under the corresponding tab.

- **Host:** CPU model, host quantity, total memory, allocated VM memory, memory allocation rate, VM quantity, quantity of running VMs, storage usage, and host list.
- **VMs:** the number of Windows OS versions, number of Linux OS distributions, total memory, total number of vCPU, number of disks, disk capacity, number of VMs, and VM list

- Step 1** On the **Source Resources** page, click **VMware Resources** in the **Source Resources** card.



Step 2 On the displayed **Resource Statistics** page, click the **Host** or **VM** tab to view resource statistics.

----End

2.4.2 Simple Project

2.4.2.1 Discovering Resources over the Internet

Before migrating, you need to discover your resources and collect their details. This section describes how to discover resources provisioned on cloud platforms such as Alibaba Cloud, Huawei Cloud, AWS, Tencent Cloud, Google Cloud, Azure, Qiniu Cloud, and Kingsoft Cloud over the Internet. The resource types MgC can discover depends on the cloud platform.

- Alibaba Cloud and Huawei Cloud: servers, containers, middleware, databases, networks, and storage
- Tencent Cloud: servers, databases, and storage
- AWS, Google Cloud, and Azure: servers, containers, middleware, databases, storage, and networks
- Qiniu Cloud and Kingsoft Cloud: object storage

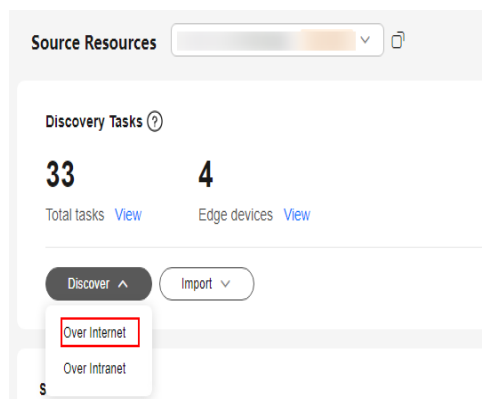
Creating a Discovery Task

Step 1 Sign in to the **MgC console**.

Step 2 In the navigation pane on the left, choose **Research > Source Resources**. Select a **migration project** in the upper left corner of the page.

Step 3 In the **Discovery Tasks** card, choose **Discover > Over Internet**.

Figure 2-19 Discovery over Internet



Step 4 Configure a discovery task based on **Table 2-11**.

Table 2-11 Parameters for creating an Internet-based discovery task

Area	Parameter	Description	Mandatory
Basic Settings	Task Name	Specify a name for the task.	Yes
	Task Description	Describe the task.	No
Task Settings	Source Platform	Select the source cloud platform. Currently, Alibaba Cloud, Huawei Cloud, AWS, Tencent Cloud, Google Cloud, Azure, Qiniu Cloud, and Kingsoft Cloud are supported.	Yes
	Credential	<p>Select the credential for accessing the source cloud platform. If no credential is available, choose Create to add one. For details, see Managing Credentials.</p> <ul style="list-style-type: none"> If the source cloud platform is Alibaba Cloud, Huawei Cloud, AWS, Tencent Cloud, Qiniu Cloud, or Kingsoft Cloud, select AK/SK for Authentication and enter the AK/SK pair of your source cloud account. If the source cloud platform is Google Cloud, select Configuration File for Authentication and upload the configuration file that contains your Google Cloud service account credentials. The file must be in JSON format and cannot exceed 4 KB. If the source cloud platform is Azure, Select ID/Secret for Authentication. To learn how to obtain Azure credentials, see How Do I Obtain Azure Credentials? 	Yes
	Region	Select the region where your source environment is located. Multiple regions can be selected.	Yes

Step 5 Choose the resource types (collection items) to be collected from the **Resource Type** drop-down list. For resource types supported for each cloud platform, see [Table 2-12](#).

Figure 2-20 Selecting the categories of resources to be discovered

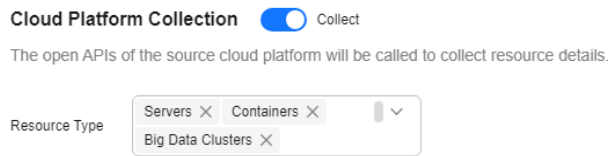


Table 2-12 Supported resource types

Cloud Platform	Resource Type	Subtype
Alibaba Cloud	<ul style="list-style-type: none"> • Servers • Containers • Big data clusters • Databases 	-
	Middleware	<ul style="list-style-type: none"> • Redis • Kafka
	Storage	<ul style="list-style-type: none"> • Object storage • File storage
	Networks	<ul style="list-style-type: none"> • Cloud connections • Load balancers (ALB and CLB) • Private lines • Public domain names • Private domain names • EIPs • Public NAT gateways • Route tables • Security groups • VPCs • VPN gateways
Huawei Cloud	<ul style="list-style-type: none"> • Servers • Containers • Big data clusters • Databases 	-
	Middleware	<ul style="list-style-type: none"> • Redis • Kafka

Cloud Platform	Resource Type	Subtype
	Storage	<ul style="list-style-type: none"> Object storage File storage
	Networks	<ul style="list-style-type: none"> Load balancers (ELB) Public domain names Private domain names EIPs Public NAT gateways Route tables Security groups VPCs
AWS	<ul style="list-style-type: none"> Servers Containers Databases 	-
	Storage	<ul style="list-style-type: none"> Object storage File storage
	Networks	<ul style="list-style-type: none"> Load balancers (ELB) (Currently, only CLB balancers are supported.) Public domain names Private domain names EIPs Public NAT gateways Route tables Security groups VPCs
	Storage	<ul style="list-style-type: none"> Object storage File storage
Tencent Cloud	<ul style="list-style-type: none"> Servers Databases 	-
	Storage	<ul style="list-style-type: none"> Object storage File storage
Google Cloud	<ul style="list-style-type: none"> Servers Containers Databases 	-
	Middleware	Redis

Cloud Platform	Resource Type	Subtype
	Storage	<ul style="list-style-type: none"> Object storage File storage
	Networks	<ul style="list-style-type: none"> EIPs Route tables Security groups VPCs
Azure	<ul style="list-style-type: none"> Servers Containers Databases 	-
	Storage	<ul style="list-style-type: none"> Object storage File storage
	Middleware	<ul style="list-style-type: none"> Redis Kafka
	Networks	<ul style="list-style-type: none"> EIPs Route tables Security groups Public NAT gateways VPCs Load balancers
Qiniu Cloud	Storage	Object storage
Kingsoft Cloud	Storage	Object storage

Step 6 (Optional) Group the servers to be discovered as an application.

- If an **application** is available, select the application from the **Application** drop-down list.
- If no applications are available, click **Create Application**. In the displayed dialog box, enter an application name and description, select the business scenario, environment, and region, and click **OK**.

Step 7 Click **Confirm**. After this Internet-based discovery task is created, MgC starts discovering details about resources and applications.

- You can **view the list and details of discovered resources** on the **Resource Discovery** page.
- You can **view the task status and details** on the task list page.

Step 8 Wait until the task status changes to **Succeeded**. Then perform subsequent operations for different types of resources.

- For discovered servers, **perform a deep collection** or **check their migration readiness** and then design a **migration solution** or **migration plan**.
- For discovered containers, **perform a deep collection** and **design a migration solution**.
- **Design migration solutions** for middleware, database, and storage resources. **Deep collection** is available for AWS RDS (for MySQL, MariaDB, Aurora, PostgreSQL, SQL Server, and Oracle) and AWS DocumentDB databases.
- Perform a **deep collection** and design migration plans for object storage resources. For details, see **Migration Plans**.

----End

Check Migration Readiness for Servers

Perform the following steps to check whether your source servers meet the migration requirements:

1. **Install Edge** in the source intranet environment and connect Edge to MgC.
2. In the **Resources** area, click **Server** in the **Category** column or the number in the **Total Resources** column.

Source Resources

Category	Total Resources
Server	370
Container	12
Middleware	2
Database	3
Big Data	0
Network	542
Storage	166

3. Select the servers to migrate together and click **Group as Application** above the list.
 - If you have **created an application**, select the application from the drop-down list and click **OK**.
 - If you have not created an application, click **Create Application** in the displayed dialog box. Then enter an application name and description, select a business scenario, environment, and target region, and click **Create**. Then click **OK**.
4. On the top of the server list, choose **Migration Scenario > Server migration**.
5. For each source server, click **Configure** in the **Migration Readiness** column.
6. Configure the parameters listed in **Table 2-13**.

Table 2-13 Parameters for configuring migration readiness

Parameter	Configuration
Type	Set this parameter based on the source server OS type.
Edge Device	Select the Edge device in the source environment.

Parameter	Configuration
Access IP Address	Select the IP address for accessing the source server. It can be a public or private IP address. After the pre-migration check is passed, the IP address you select here will be used for migration.
Port	<p>Enter the port on the source server that allows access from the Edge device.</p> <ul style="list-style-type: none"> By default, port 5985 on Windows source servers must be opened to the Edge device. The port cannot be changed. By default, port 22 on Linux source servers must be opened to the Edge device. You can specify a different port if needed.
Credential	<p>Select the server credential. If the credential has not been added to MgC, go to the Edge console, add the server credential to Edge, and synchronize it to MgC.</p> <p>NOTICE</p> <p>The account provided in the credential must have sufficient permissions, so Edge can collect necessary server details. To perform a deep collection for the server to collect as much as details, the credential you provided must meet the following requirements:</p> <ul style="list-style-type: none"> Linux: root and its password Windows: administrator and its password

- Click **Confirm**. The system checks whether the source server can be accessed using the information you provided and whether the server can be migrated. If **Ready** shows up in the **Migration Readiness** column, the source server can be migrated. Then you can [design a migration solution](#) or [design a migration plan](#) to migrate the server.

Performing a Deep Collection for Servers

Perform the following steps to perform a deep collection for your source servers:

- Ensure that [Edge](#) has been installed in the source intranet environment and has been connected to MgC.
- In the **Resources** area, click **Server** in the **Category** column or the number in the **Total Resources** column.
- For each server whose details need to be collected, in the **Edge Device** column, click **Configure**. Configure the parameters listed in [Table 2-14](#).

Table 2-14 Parameters for configuring a deep collection

Parameter	Configuration
Type	Set this parameter based on the source server OS type.
Edge Device	Select the Edge device in the source environment.

Parameter	Configuration
Access IP Address	Select the IP address for accessing the source server. It can be a public or private IP address. After the pre-migration check is passed, the IP address you select here will be used for migration.
Port	Enter the port on the source server that allows access from the Edge device. <ul style="list-style-type: none">• By default, port 5985 on Windows source servers must be opened to the Edge device. The port cannot be changed.• By default, port 22 on Linux source servers must be opened to the Edge device. You can specify a different port if needed.
Credential	Select the server credential. If the credential has not been added to MgC, go to the Edge console, add the server credential to Edge, and synchronize it to MgC. NOTICE The account provided in the credential must have sufficient permissions, so Edge can collect necessary server details. To perform a deep collection for the server to collect as much as details, the credential you provided must meet the following requirements: <ul style="list-style-type: none">• Linux: root and its password• Windows: administrator and its password

4. Click **Confirm**. Then the system automatically starts executing a deep collection. When **Collected** shows up in the **Deep Collection** column, the collection is complete. You can **design a migration solution** or **design a migration plan** to migrate your servers.

Performing a Deep Collection for Containers

Perform the following steps to perform a deep collection for your containers:

1. Ensure that **Edge** has been installed in the source intranet environment and has been connected to MgC.
2. In the **Resources** area, click **Container** in the **Category** column or the number in the **Total Resources** column.
3. For each container resource whose details need to be collected, click **Associate** in the **Edge Device** column.
To associate multiple container resources with one Edge device, select them and choose **Manage Device Association** above the list.
4. Select the Edge device in the source environment and click **OK**. Wait until **Associated** appears in the **Edge Device** column.
5. For each container resource, in the **Credential** column, click **Associate** to configure their credentials.
6. Select the resource credential. If the credential has not been added to MgC, go to the Edge console, **add the credential** to Edge, and synchronize it to MgC.

7. Click **OK**. Then MgC checks whether the resource can be accessed using the associated credential. When **Ready** appears in the **Deep Collection** column, click **Collect** to perform a deep collection. You can click **Collect Again** in the **Deep Collection** column to perform a second deep collection if needed. After the collection is complete, click the resource name to view the collected details.

Performing a Deep Collection for Object Storage Resources

Follow the steps below to perform a deep collection for your object storage resources, so the system can use the collected details to recommend rightsized migration clusters.

1. Ensure that **Edge** has been installed in the source intranet environment and has been registered with MgC.
2. On the **Resource Discovery** page, in the **Resources** area, click **Storage** in the **Category** column or the number in the **Total Resources** column.
3. Locate an object storage resource and click **Configure** in the **Deep Collection** column.
4. Select the Edge device in the source environment and the credential used for accessing the resource, and click **Confirm**. If the credential has not been added to MgC, go to the Edge console and **add the resource credential** to Edge and synchronize it to MgC.

NOTICE

To perform a deep collection for your Azure object storage resources, you need to provide your storage account and access key. For details about how to obtain the credentials, see [How Do I Obtain the Required Credentials Before Using MgC to Perform a Deep Collection for My Azure Object Storage Resources?](#)

5. Click **Add Prefix** in the **Operation** column.
6. Enter a prefix to filter the objects whose details need to be collected. If this parameter is not specified, all objects in the bucket are collected by default. Click **OK** to save the prefix settings.
7. Click **Deep Collection** in the **Operation** column. The system starts collecting path details. You can perform a deep collection on a resource for multiple times. When **Collection Status** changes to **Completed**, click the resource name to view the collected information.

Performing a Deep Collection for Databases

Deep collection is available for AWS RDS (for MySQL, MariaDB, Aurora, PostgreSQL, SQL Server, and Oracle) and AWS DocumentDB databases. The data collected includes database version, engine, server character set, average transactions per second (TPS), and queries per second (QPS), and other key performance metrics (KPIs). The collected data depends on the database type.

1. Ensure that **Edge** has been installed in the source intranet environment, can access source databases, and has been registered with MgC.

2. On the **Resource Discovery** page, in the **Resources** area, click **Database** in the **Category** column or the number in the **Total Resources** column.
3. In the database list, filter all discovered AWS databases by applying the **Vendor** filter. Locate a supported database and in the **Edge Device** column, click **Associate**.

To associate multiple databases with one Edge device, select them and choose **Manage Device Association** above the list.

4. Select your Edge device. For **Access Setting**, if the selected resource is in the same VPC as the Edge device, select **Private access**. Otherwise, select **Public access**. Then click **OK**. Wait until **Associated** appears in the **Edge Device** column.
5. In the **Credential** column, click **Associate** to associate the credential for accessing the resource.
6. Select the database credential. If the credential has not been added to MgC, go to the Edge console, [add the credential](#) to Edge, and synchronize it to MgC.
7. Click **OK**. Then MgC checks whether the resource can be accessed using the associated credential. When **Ready** appears in the **Deep Collection** column, click **Collect** to perform a deep collection. You can click **Collect** in the **Deep Collection** column to perform a deep collection again if needed.
8. Wait for the deep collection to complete. Then click the database name to go to the database details page. In the **Database Information** area, you can view the collected details.

Viewing Discovered Source Resources

A discovery task can collect only basic information about source resources. More detailed information needs to be collected through a deep collection.

1. On the **Resource Discovery** page, in the **Resources** area, view the number of discovered resources by category and the number of resources that are not associated with applications.

Figure 2-21 Viewing the resource list

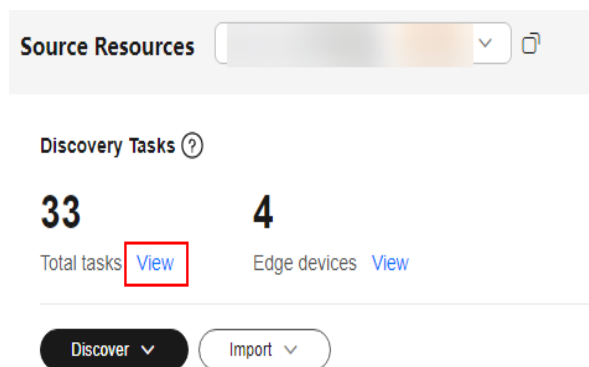
Category	Total Resources	Unassociated Resources
Server	370	142
Container	12	0
Middlewares	2	2
Database	3	1
Big Data	0	0
Network	542	542
Storage	195	163

2. Click a resource category or number to view the resource list.
3. Click a resource name to view its details.

Viewing Discovery Tasks

Step 1 On the **Resource Discovery** page, click **View** next to **Total tasks** to go to the task list.

Figure 2-22 Viewing the task list



Step 2 Locate a discovery task, and click **View** in the **Operation** column.


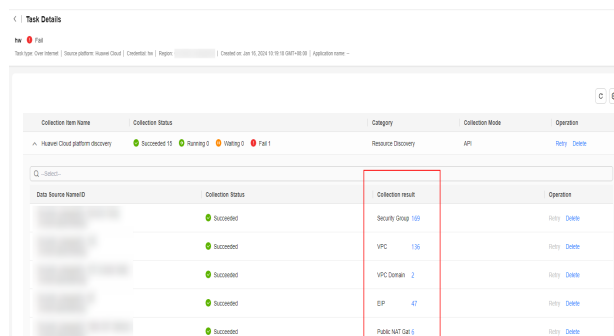
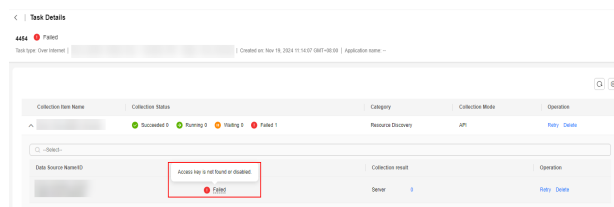
Step 3 Click  before a collection item to view the data sources contained in the collection item and the collection results.

Figure 2-23 Viewing collection results



If a data source fails to be collected, you can move the cursor to the collection status of the data source to view the failure cause.



Step 4 In the **Collection Result** column, you can click the number next to a resource category to view the corresponding resource list.

----End

2.4.2.2 Discovering Resources over an Intranet

This section describes how to discover servers in on-premises environments. Before getting started, you need to install Edge in the source intranet. Then you can discover servers by network range or VMware host.

Precautions

- Only VMs in VMware vSphere 5.0 to 7.0 can be discovered.
- When the system scans VMware VMs or scans servers on specified network ranges, it uses the servers' private IP addresses and the ID of the used Edge device to identify discovered servers. If a server's private IP address changes after a collection is complete, the server will be identified as a new one during the next collection, and the total number of discovered servers will increase. To avoid this, you are advised not to change private IP addresses of source servers before the migration is complete.

Prerequisites

- You have [installed Edge](#) in the source intranet environment and have connected the Edge device to MgC.
- You have [added source server credentials](#) to Edge.

NOTICE

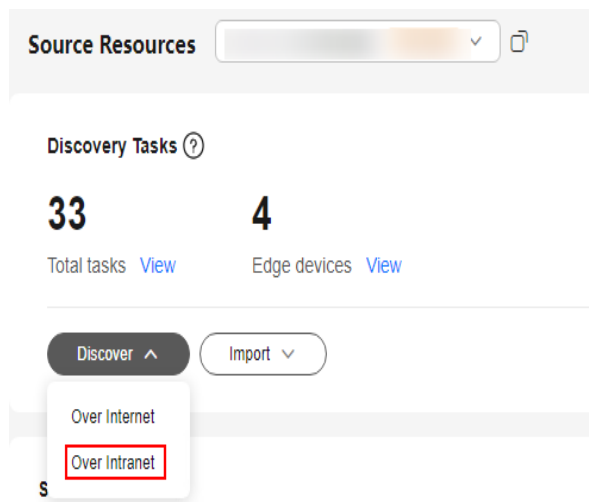
To perform a deep collection for your source servers to collect as much as details, provide server credentials that meet the following requirements:

- Linux: **root** and its password
 - Windows: **administrator** and its password
-

Procedure

- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane on the left, choose **Research > Source Resources**. Select a [migration project](#) in the upper left corner of the page.
- Step 3** In the **Discovery Tasks** card, choose **Discover > Over Intranet**.

Figure 2-24 Discovery over an intranet



Step 4 Configure the parameters listed in [Table 2-15](#).

Table 2-15 Parameters for creating an intranet-based discovery task

Parameter	Description
Task Name	Enter a task name.
Task Description	Describe the task.
Edge Device	Select the Edge device in the source intranet environment.

Step 5 Enable **Scan Network Range** or **Scan VMware VMs** to discover servers as needed.

- If **Scan Network Range** is enabled, configure parameters listed in [Table 2-16](#).

Table 2-16 Parameters for scanning a network range

Parameter	Description
Protocol	Select the communication protocol TCP or ICMP .
Network Range	Enter an IP address range which must fall within: <ul style="list-style-type: none"> - 10.0.0.0 – 10.255.255.255 - 172.16.0.0 – 172.31.255.255 - 192.168.0.0 - 192.168.255.255
Linux	Enter the port for scanning Linux servers. This parameter is available only if you choose the TCP protocol. If you need to skip Linux servers during the scan, set this parameter to 0 .

Parameter	Description
Windows	Enter the port for scanning Windows servers. This parameter is available only if you choose the TCP protocol. If you need to skip Windows servers during the scan, set this parameter to 0 .

- If **Scan VMware VMs** is enabled, in the **IP Address** text box, enter the IP address of the vCenter Server where the VMs will be discovered, and select the credential for accessing the vCenter Server. All VMs managed by the vCenter Server will be discovered. If the vCenter Server's credential has not been added to Edge, **add the resource** to Edge. When adding the credential, enter the username and password for logging in to the vCenter Server.

Step 6 Click **Confirm**. The intranet-based discovery task is created, and MgC starts collecting details about source servers.

On the **Source Resources** page, in the **Discovery Tasks** card, click **View** next to **Total tasks**.

Step 7 Wait until the task status changes to **Succeeded**, and perform a deep collection.

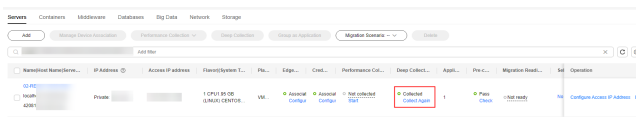
1. On the **Source Resources** page, in the resource list, click **Server** in the **Category** column or the number in the **Total Resources** column.
2. In the **Edge Device** or **Credential** column, click **Configure**.
3. Configure the parameters listed in **Table 2-17**.

Table 2-17 Parameters for configuring a deep collection

Parameter	Configuration
Type	Set this parameter based on the source server OS type.
Edge Device	Select the Edge device in the source environment.
Access IP Address	Select the IP address for accessing the source server. It can be a public or private IP address. After the pre-migration check is passed, the IP address you select here will be used for migration.
Port	Enter the port on the source server that allows access from the Edge device. <ul style="list-style-type: none"> – By default, port 5985 on Windows source servers must be opened to the Edge device. The port cannot be changed. – By default, port 22 on Linux source servers must be opened to the Edge device. You can specify a different port if needed.
Credential	Select the server credential. If the credential has not been added to MgC, go to the Edge console, add the server credential to Edge, and synchronize it to MgC.

- Click **Confirm**. Then the system automatically starts executing a deep collection. When **Collected** shows up in the **Deep Collection** column, the collection is complete. You can [design a migration solution](#) or [design a migration plan](#) to migrate your servers.

Figure 2-25 Discovery completed



----End

2.4.2.3 Importing Details of Alibaba Cloud Resources

You can import CSV-formatted resource details from Alibaba Cloud directly into MgC. You first need to export the resource details from Alibaba Cloud. After the import is complete, you can view the resource details on the MgC console. With the imported details, you can get recommendations for suitable Huawei Cloud resources.

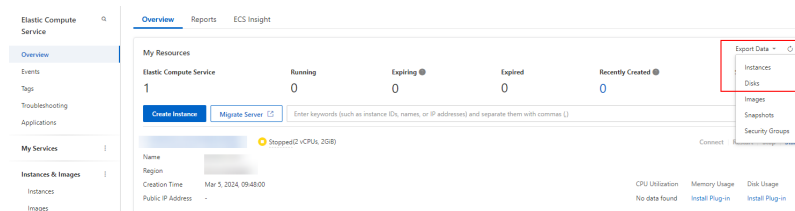
The supported Alibaba Cloud resources are:

- Elastic Compute Service (ECS) instances and cloud disks
- Object Storage Service (OSS) buckets
- ApsaraDB RDS for MySQL instances
- ApsaraDB RDS for GaussDB instances

Exporting Data of Alibaba Cloud ECS Instances and Disks

Step 1 Sign in to the Alibaba Cloud ECS console.

Step 2 On the **Overview** page, choose **Export Data > Instances** to export a list of all ECS instances.



Step 3 Choose **Export Data > Disks** to export a list of all cloud disks.

Step 4 Open the instance list and the disk list and adjust the resource information if needed. Ensure that the lists contain the necessary information.


List	Mandatory Fields
Instance list	Instance ID, OS, instance specifications, CPU, and memory
Disk list	Instance ID, disk ID, capacity (GiB), and disk attributes

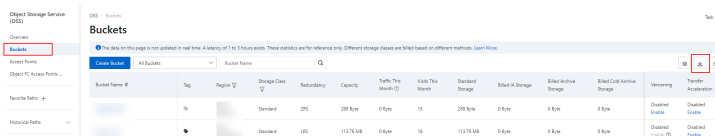
----End

Exporting Data of Alibaba Cloud OSS Buckets

Step 1 Sign in to the OSS console.

Step 2 In the left navigation pane, choose **Buckets**.

Step 3 Click the  icon in the upper right corner of the list. The **Export Bucket List** dialog box is displayed.




Step 4 Select the information to be exported and click **OK**.

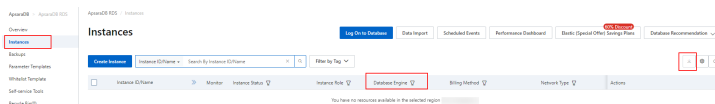
----End

Exporting Data of Alibaba Cloud ApsaraDB RDS for MySQL Instances

Step 1 Sign in to the Alibaba Cloud ApsaraDB RDS for MySQL console.

Step 2 In the navigation pane on the left, choose **Instances**. Select a region in the upper part of the page.

Step 3 Filter all MySQL instances in the **Database Engine** column and click the  icon in the upper right corner of the list.



Step 4 In the displayed dialog box, select the information to be exported. Click **OK**. The system exports the instance information to a CSV file and automatically downloads the file.

Step 5 Modify the exported CSV file so MgC can parse the file content.

1. Use a file editor to open the CSV file and search for **PrivatePort(A network port,)** in the table header.
2. Delete the comma (,) from this field and save the file. The correct format is **PrivatePort(A network port)**.

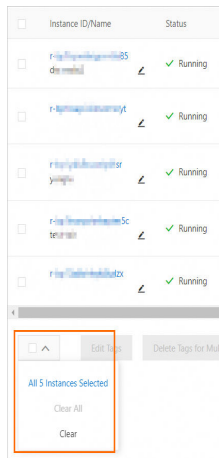
----End


Exporting Data of Alibaba Cloud ApsaraDB RDS for Redis Instances

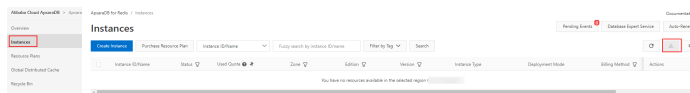
Step 1 Sign in to the Alibaba Cloud ApsaraDB for Redis console.

Step 2 In the navigation pane on the left, choose **Instances**. Select a region in the upper part of the page.

Step 3 In the lower left corner of the page, expand  and click **Select All**.



Step 4 Click the  icon in the upper right corner of the list. In the dialog box that is displayed, select the information to be exported.



Step 5 Click **OK**. The system exports the instance information to a CSV file and automatically downloads the file.

Step 6 Modify the exported CSV file so MgC can parse the file content.

1. Use a file editor to open the CSV file.
2. Add a comma (,) at the end of the table heading line and save the file.

The following shows an example table header before modification:

```
ID,Name,Quantity
```

The following shows the table header after modification:

```
ID,Name,Quantity,
```

----End

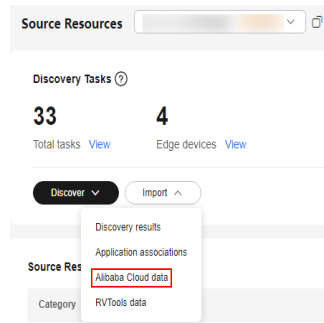
Importing Details of Alibaba Cloud Resources

Step 1 Sign in to the [MgC console](#).

Step 2 In the navigation pane on the left, choose **Research > Source Resources**. Select a [migration project](#) in the upper left corner of the page.

Step 3 In the **Discovery Tasks** card, choose **Import > Alibaba Cloud Data**.

Figure 2-26 Importing details of Alibaba Cloud resources



NOTICE

Only CSV files encoded in UTF-8 format with English table headers can be imported. The size of a single file cannot exceed 15 MB. For details about how to convert the encoding format of a CSV file to UTF-8, see [How Do I Convert the Encoding Format of a CSV File to UTF-8?](#)

Step 4 In the **Resource Type** drop-down list, select the types of resources to be imported and upload the corresponding file.

Import Alibaba Cloud

For any resources whose IDs can be found in the MgC database, any existing resource information will be updated, and any new resource associations and dependencies will be combined with existing ones.

* Resource List Help

* Resource List

Only UTF-8 CSV files with English table headers can be uploaded. Maximum file size: 50MB MB.
[UTF-8 Encoding Conversion Method](#)

* Cloud Disk Resource List

Only UTF-8 CSV files with English table headers can be uploaded. Maximum file size: 50MB MB.

Resource Type	Procedure
Servers	<ol style="list-style-type: none"> Click Select File next to Resource List and select the exported ECS list. Click Select File next to Cloud Disk List and select the exported disk list.
Redis	Click Select File next to Resource List and select the exported Redis instance list .

Resource Type	Procedure
Object storage	Click Select File next to Resource List and select the exported OSS bucket list .
Databases	Click Select File next to Resource List and select the exported MySQL instance list .

Step 5 Click **Confirm**. After the resource list is uploaded successfully, select the corresponding resource categories to view the imported resource information.

Step 6 (Optional) Group imported Alibaba Cloud resources as applications. For details, see [Grouping Resources as Applications](#). Then assess the applications to obtain recommendations for Huawei Cloud resources. For details, see [Getting Target Recommendations](#).

----End

2.4.2.4 Importing RVTools Data

Notes and Constraints

- **Supported RVTools versions**

The supported RVTools versions include:

- 4.4.1
- 4.4.2
- 4.4.3
- 4.4.4
- 4.4.5
- 4.5.0
- 4.5.1
- 4.6.1

- **File format requirements**

Only the Excel (.xlsx) format is supported.

- **File size and compression ratio requirements**

The file to be imported cannot be larger than 100 MB, and the compression ratio cannot be lower than 5%.

Step 1: Exporting RVTools Data

Step 1 Start the RVTools application.

Step 2 On the login page, enter the following information:

- In the **IP address/Name** text box, enter IP address of the vCenter server.
- In the **User name** text box, enter the username for connecting to the vCenter server.
- In the **Password** text box, enter the password corresponding to the username.

Step 3 Click **Login**. In the top menu bar, choose **File > Export all to Excel**.

Step 4 Select a path for saving the file that contains details about your resource.

----End

Step 2: Uploading the Exported File to OBS

Step 1 Sign in to Huawei Cloud **OBS console** and create a Standard bucket for storing the file exported from RVTools. For details, see **Creating a Bucket**.

Step 2 Upload the **file exported from RVTools** to the Standard OBS bucket. For details, see **Uploading an Object**.

----End

Step 3: Importing RVTools Data

Step 1 Sign in to the **MgC console**.

Step 2 In the navigation pane on the left, choose **Research > Source Resources**. Select a **migration project** in the upper left corner of the page.

Step 3 In the **Discovery Tasks** card, choose **Import > RVTools data**.

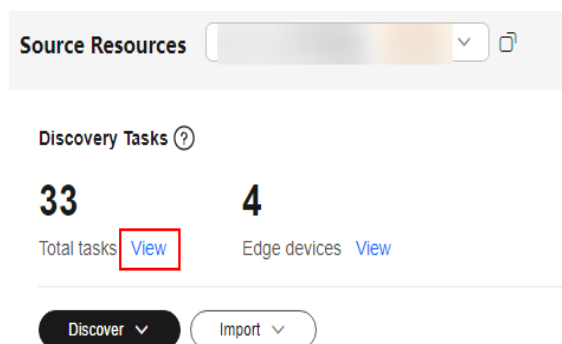


NOTE

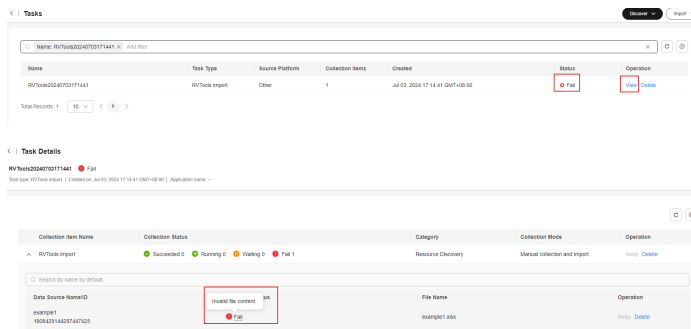
If you are using this function for the first time, click **OK** in the **Authorization Required** dialog box to agree to the agency-based authorization.

Step 4 In the **File** drop-down list, locate the OBS bucket you used to store the file exported from RVTools in **step 2**, select the exported file, and click **Confirm**.

Step 5 After the upload is successful, in the **Discovery Tasks** card, click **View** next to **Total tasks**. In the task list, view the task status.



- If the task status is **Failed**, click **View** in the **Operation** column to view the data source that failed to be collected. You can move the cursor to the collection status to view the failure cause. For details about how to rectify common failure causes, see [What Can I Do If Importing RVTools Data Fails?](#) After handling the failure cause, you need to delete the failed task and perform a second import.



- If the task status is **Succeeded**, you can view the imported [resource details](#) and [resource statistics](#).

----End

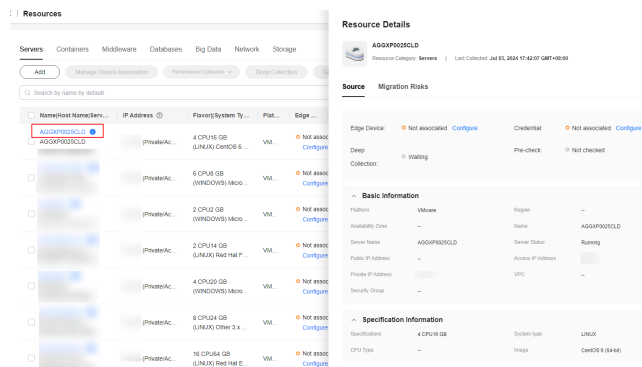
Viewing Resource Details

If the status of the RVTools import task is **Succeeded**, you can view the details of VMware servers, including the hostname, server ID, IP address, specifications, OS type, and platform.

- Step 1** On the **Source Resources** page, in the resource list, click **Server** in the **Category** column or the number in the **Total Resources** column.

Category	Total Resources
Server	370
Container	12
Middleware	2
Database	3
Big Data	0
Network	542
Storage	166

- Step 2** In the server list, you can view the imported server information. You can click a resource name to view more details.



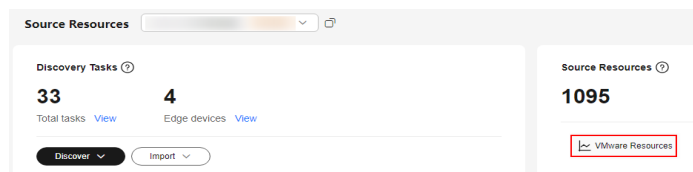
----End

Viewing Resource Statistics

If the status of the RVTools import task is **Succeeded**, you can view the VMware resource statistics under the corresponding tab.

- **Host:** CPU model, host quantity, total memory, allocated VM memory, memory allocation rate, VM quantity, quantity of running VMs, storage usage, and host list.
- **VMs:** the number of Windows OS versions, number of Linux OS distributions, total memory, total number of vCPU, number of disks, disk capacity, number of VMs, and VM list

Step 1 On the **Source Resources** page, click **VMware Resources** in the **Source Resources** card.



Step 2 On the displayed **Resource Statistics** page, click the **Host** or **VM** tab to view resource statistics.

----End

2.4.3 Manually Adding Resources

You can manually add servers and Oracle databases to MgC. To collect details about these resources, you need to install Edge in the source environment.

Preparations

- **Create a migration project** on the MgC console.
- **Install Edge** in the source intranet environment and **connect Edge to MgC**.
- **Add resource credentials** to Edge.

Adding a Server

Step 1 Sign in to the **MgC console**.

Step 2 In the navigation pane on the left, choose **Research > Source Resources**. Select a **migration project** in the upper left corner of the page.

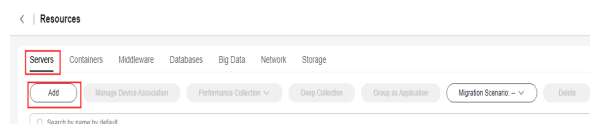
Step 3 In the **Resources** area, click **Server** in the **Category** column or the number in the **Total Resources** column.

Source Resources

Category	Total Resources
Server	370
Container	12
Middleware	2
Database	3
Big Data	0
Network	542
Storage	166

Step 4 Click **Add** above the list.

Figure 2-27 Adding a server



Step 5 In the displayed dialog box, configure parameters listed in **Table 2-18** and click **Confirm**. The system automatically checks the credential status and starts collecting resource details.

Table 2-18 Parameters for adding a server

Parameter	Description
Name	Enter a server name.
Edge Device	Select the Edge device installed in the source environment.
Type	Select the OS type of the source server.
IP Address	Enter the IP address of the source server. If the source server is in the same VPC as the Edge device, you can enter the private IP address of the server. Otherwise, you have to enter its public IP address.
Port	Enter the port on the source server opened to the Edge device. <ul style="list-style-type: none"> By default, port 5985 on Windows source servers must be opened to the Edge device. The port cannot be changed. By default, port 22 on Linux source servers must be opened to the Edge device. You can specify a different port if needed.

Parameter	Description
Credential	Select the server credential. If the credential has not been added to MgC, go to the Edge console, add the server credential to Edge, and synchronize it to MgC.

Step 6 View the added server on the **Servers** tab.

----End

Adding a Database

Step 1 Sign in to the [MgC console](#).

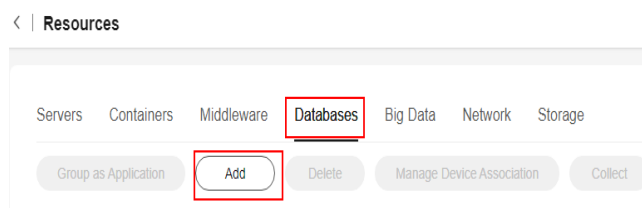
Step 2 In the navigation pane on the left, choose **Research > Source Resources**. Select a [migration project](#) in the upper left corner of the page.

Step 3 In the **Resources** area, click **Database** in the **Category** column or the number in the **Total Resources** column.

Source Resources

Category	Total Resources
Server	370
Container	12
Middleware	2
Database	3
Big Data	0
Network	542
Storage	166

Step 4 Click **Add**.



Step 5 Set the parameters listed in [Table 2-19](#).

Add Database ×

* Name

* Edge Device

* Type

* IP Ensure that the collection device can connect to the resource using this address.

* Port

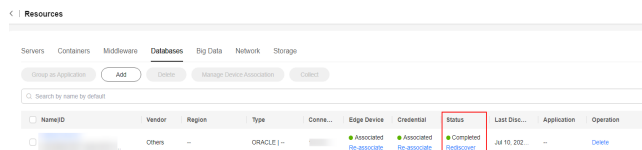
* Service Name/SID

* Credentials

Table 2-19 Parameters for adding a database

Parameter	Description
Name	Enter a server name.
Edge Device	Select the Edge device that is connected to MgC.
Type	Select Oracle .
IP Address	Enter the IP address for connecting to the source Oracle database server.
Port	Enter the listening port of the source Oracle database. The default value is 1521.
Service Name/SID	Enter the service name of the source database. The default value is ORCL . You can log in to the Oracle database server and run the following command to view the service name of the database you want to add to MgC: <code>SELECT instance_name FROM v\$instance;</code>
Credential	Select the database credential. If the credential has not been added to MgC, go to the Edge console, add the credential to Edge, and synchronize it to MgC. When you add the credential to Edge, set Resource Type to Database and Authentication to User name/Password .

Step 6 Click **Confirm**. The system automatically starts collecting details about the database. When **Collected** is displayed in the **Deep Collection** column, the collection is complete. Click the database name. On the displayed database details page, you can view the collected information.



Name/ID	Vendor	Region	Type	Conn...	Edge Device	Credential	Status	Last Disc...	Application	Operation
	Others	-	ORACLE I...		Associated No associate	Associated No associate	Completed Refresh	Jul 10, 202...	-	Delete

----End

2.4.4 Collecting Server Performance Data

MgC can collect server performance data, including the CPU usage, memory usage, disk IOPS, inbound and outbound traffic, inbound and outbound packets, and the number of network connections. The collected performance data will be used by MgC to recommend rightsized servers.

Notes

- After a collection starts, performance data is collected every 5 minutes by default.
- The collection duration should be at least 1 hour. If the collection duration is too short, the maximum and average values in 7- and 30-day history cannot be calculated.
- A performance collection runs for seven days by default and stops after the period ends. You can stop or restart the collection at any time. After the collection is restarted, the collection period is recalculated.
- Collected performance data will be retained for 180 days and automatically deleted after that.
- It is recommended that Edge be installed on an independent server to ensure collection stability and efficiency.
- Edge can collect performance data from up to 1,000 Linux servers at the same time. If there are 1,000 or more Linux servers to be collected, the server where Edge is installed must have at least 8 CPUs and 16 GB of memory with at least 8 GB available.
- Edge can collect performance data from up to 500 Windows servers at the same time. If there are 500 or more Windows servers to be collected, the server where Edge is installed must have at least 16 CPUs and 32 GB of memory with at least 8 GB available.

Prerequisites

- You have completed a discovery task over the Internet or intranet, or you have manually added servers to MgC.
- You have **installed Edge** in the source intranet environment and have connected the Edge device to MgC.
- You have **added source server credentials** to Edge.

Procedure

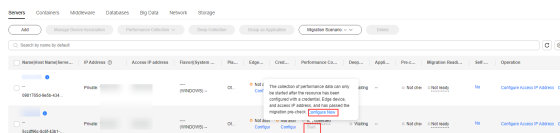
Step 1 Sign in to the **MgC console**.

Step 2 In the navigation pane on the left, choose **Research > Source Resources**. Select a **migration project** in the upper left corner of the page.

Step 3 In the **Resources** area, click **Server** in the **Category** column or the number in the **Total Resources** column.

Step 4 Configure an Edge device and credentials for the servers whose performance data needs to be collected.

- If the **Start** button in the **Performance Collection** column is dimmed, move the cursor to the **Start** button. In the dialog box that is displayed, click **Configure Now**.



- If the **Start** button in the **Performance Collection** column is available, the configuration is complete. In this case, skip this step and go to [step 7](#).

Step 5 Configure the parameters listed in [Table 2-20](#).

Table 2-20 Parameters for configuring a migration pre-check

Parameter	Configuration
Type	Set this parameter based on the source server OS type.
Edge Device	Select the Edge device in the source environment.
IP Address	Select the IP address used for accessing the source server. It can be a public or private IP address. If you need to use a proxy to access the server, enter the proxy IP address. After the migration pre-check passes, the IP address will be used for subsequent migration.
Port	Enter the port on the source server opened to the Edge device. <ul style="list-style-type: none"> • By default, port 5985 on Windows source servers must be opened to the Edge device. The port cannot be changed. • By default, port 22 on Linux source servers must be opened to the Edge device. You can specify a different port if needed.
Credential	Select the server credential. If the credential has not been added to MgC, go to the Edge console, add the server credential to Edge, and synchronize it to MgC.

Step 6 Click **Confirm**. The system will verify the correctness of the configuration.

Step 7 After the configuration is verified, click **Start** in the **Performance Collection** column to start collecting server performance data. The collection status will change to **Collecting**.

After performance data collection starts, you can:

- View the collected data.

- a. Click a server name to go to its details page. In the **Performance Info** area, you can view the collected performance data. The maximum values in 7 days and 30 days are hourly aggregated data. To view these maximum values, ensure the collection duration exceeds 1 hour.
 - b. Click **View** in the **Operation** column to view the details and line chart about the performance metric in the collection period.
- Stop the collection.
Click **Stop** to pause performance data collection.

----End

2.4.5 Grouping Resources as Applications

Overview

You can divide discovered resources into groups, which we refer to as applications. Subsequent recommendation and migration processes are executed based on these applications.

Procedure

- Step 1** Sign in to the **MgC console**.
- Step 2** In the navigation pane on the left, choose **Research > Source Resources**. Select a **migration project** in the upper left corner of the page.
- Step 3** In the **Resources** area, choose a resource category to view the resource list.
- Step 4** Select the resources to be added to an application and choose **Group as Application** in the upper left corner of the page.
- Step 5** Select the application from the drop-down list. If no applications are available, click **Create Application** in the displayed dialog box. Then enter an application name and description, select a business scenario, environment, and region, and click **Create**.
- Step 6** Click **OK**. You can view the application name in the **Application** column of the resources.

----End

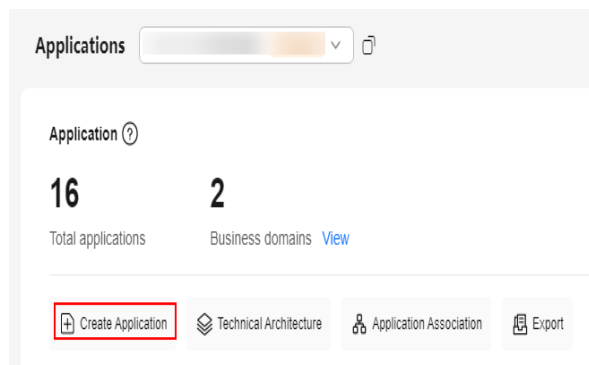
2.5 Application Management

2.5.1 Creating an Application

You can group resources with a shared business purpose as an application. These applications will be used for getting target resource recommendations and creating migration workflows.

Creating an Application

- Step 1** Sign in to the **MgC console**.
- Step 2** In the navigation pane on the left, choose **Research > Applications**. Select a **migration project** in the upper left corner of the page.
- Step 3** Click **Create Application**.



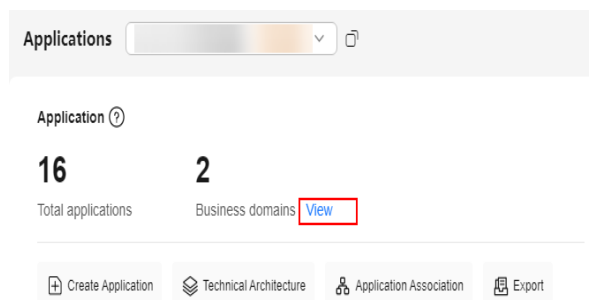
- Step 4** Enter an application name and description, select a service scenario and environment, select the region you are migrating to, and click **Create Application**. The application is successfully created, and the page for adding resources to the application is displayed.
- If source resources have been discovered, and you want to add the discovered resources to the created application, select the resources and click **Add Now**.
 - If no source resources have been discovered, click **Add Later**. You can add resources to the application later.

----End

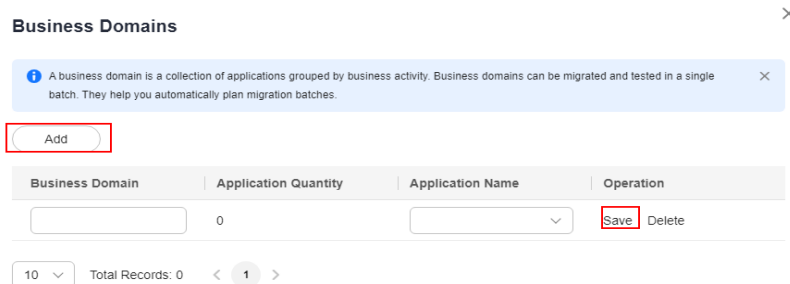
Managing Applications

You can manage applications by business domain.

- Step 1** On the **Applications** page, click **View** next to **Business domains**.



- Step 2** Click **Add**, enter a business domain name, select the applications you want to add to this domain, and click **Save**.



----End

Modifying an Application

This operation is only supported for simple projects.

- Step 1** In the application list, locate the application you want to modify and click **Modify** in the **Operation** column.
- Step 2** Modify application parameters and click **OK**.

----End

2.5.2 Adding Discovered Resources to an Application

The following procedure describes how to group discovered source servers as applications. These applications will be used for subsequent resource assessment and migration.

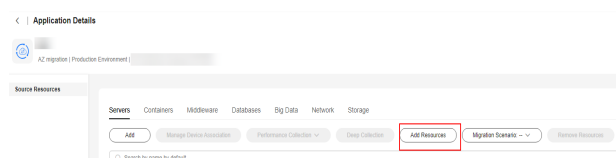
Prerequisites

Source servers have been discovered through Internet- and intranet-based discovery tasks or manual addition.

Procedure

- Step 1** Sign in to the **MgC console**.
- Step 2** In the navigation pane on the left, choose **Research > Applications**. Select the created **migration project** in the upper left corner of the page.
- Step 3** In the application list, click the application name.
- Step 4** Click the tab based on the category of resources you want to add. The following describes how to add source servers to the application. The procedure also applies to other categories of resources.
- Step 5** On the **Servers** tab, click **Add Resources** above the list.

Figure 2-28 Add discovered resources to an application



- Step 6** Select the source servers to be added to the application and click **Add Now** in the lower right corner. You can see the source servers added to the application in the list.
 - Step 7** Click **Assess** in the upper right corner of the page. Assess the application resources to obtain recommendations for the best-fit Huawei Cloud resources. For more information, see [Getting Target Recommendations](#).
- End

2.5.3 Manually Adding Custom Resources to an Application

You can add custom servers and Oracle databases to an application. To get the data about these resources to MgC, you need to install Edge in the source environment.

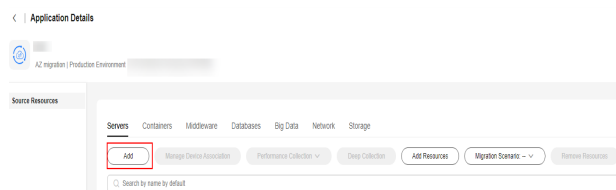
Preparations

- [Create a migration project](#) on the MgC console.
- [Install Edge](#) in the source intranet environment and [connect Edge to MgC](#).
- [Add resource credentials](#) to Edge.
- [Created an application](#) on the application management page.

Add Servers to the Application

- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane on the left, choose **Research > Applications**. Select the created [migration project](#) in the upper left corner of the page.
- Step 3** In the application list, click the application name.
- Step 4** On the **Servers** tab, click **Add Custom Resources** above the list.

Figure 2-29 Adding custom servers to the application



- Step 5** In the displayed dialog box, configure parameters listed in [Table 2-21](#) and click **Confirm**. The system automatically checks the credential status and starts collecting resource details.

Table 2-21 Parameters for adding a server

Parameter	Description
Name	Enter a server name.
Edge Device	Select the Edge device installed in the source environment.

Parameter	Description
Type	Select the OS type of the source server.
IP Address	Enter the IP address of the source server. If the source server is in the same VPC as the Edge device, you can enter the private IP address of the server. Otherwise, you have to enter its public IP address.
Port	Enter the port on the source server opened to the Edge device. <ul style="list-style-type: none"> By default, port 5985 on Windows source servers must be opened to the Edge device. The port cannot be changed. By default, port 22 on Linux source servers must be opened to the Edge device. You can specify a different port if needed.
Credential	Select the server credential. If the credential has not been added to MgC, go to the Edge console, add the server credential to Edge, and synchronize it to MgC.

Step 6 View the added server on the **Servers** tab.

----End

Adding Databases to the Application

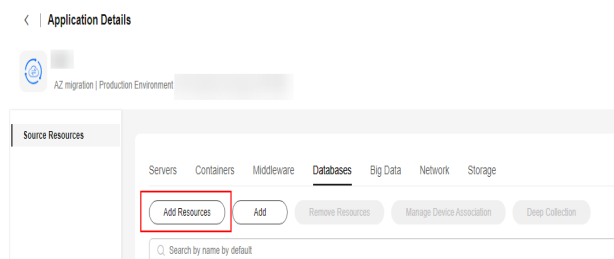
Step 1 Sign in to the **MgC console**.

Step 2 In the navigation pane on the left, choose **Research > Applications**. Select the created **migration project** in the upper left corner of the page.

Step 3 In the application list, click the application name.

Step 4 On the **Databases** tab, click **Add** above the list.

Figure 2-30 Adding custom databases



Step 5 Set the parameters listed in **Table 2-22**.

Add Database ×

* Name

* Edge Device

* Type

* IP Ensure that the collection device can connect to the resource using this address.

* Port

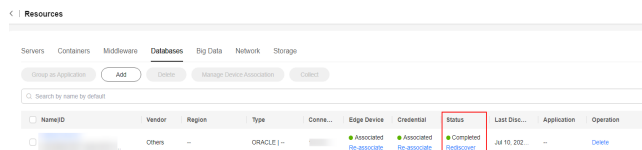
* Service Name/SID

* Credentials

Table 2-22 Parameters for adding a database

Parameter	Description
Name	Enter a server name.
Edge Device	Select the Edge device that is connected to MgC.
Type	Select Oracle .
IP Address	Enter the IP address for connecting to the source Oracle database server.
Port	Enter the listening port of the source Oracle database. The default value is 1521.
Service Name/SID	Enter the service name of the source database. The default value is ORCL . You can log in to the Oracle database server and run the following command to view the service name of the database you want to add to MgC: <code>SELECT instance_name FROM v\$instance;</code>
Credential	Select the database credential. If the credential has not been added to MgC, go to the Edge console, add the credential to Edge, and synchronize it to MgC. When you add the credential to Edge, set Resource Type to Database and Authentication to User name/Password .

Step 6 Click **Confirm**. The system automatically starts collecting details about the database. When **Collected** is displayed in the **Deep Collection** column, the collection is complete. Click the database name. On the displayed database details page, you can view the collected information.



Name/ID	Vendor	Region	Type	Conn...	Edge Device	Credential	Status	Last Disc...	Application	Operation
	Others	-	ORACLE I...		Associated No associate	Associated No associate	Completed No resource	Jul 10, 202...	-	Delete

----End

2.5.4 Collecting Server Performance Data

MgC can collect server performance data, including the CPU usage, memory usage, disk IOPS, inbound and outbound traffic, inbound and outbound packets, and the number of network connections. The collected performance data will be used by MgC to recommend rightsized servers.

Collect performance data of host resources in an application on the application details page.

Notes

- After a collection starts, performance data is collected every 5 minutes by default.
- The collection duration should be at least 1 hour. If the collection duration is too short, the maximum and average values in 7- and 30-day history cannot be calculated.
- A performance collection runs for seven days by default and stops after the period ends. You can stop or restart the collection at any time. After the collection is restarted, the collection period is recalculated.
- Collected performance data will be retained for 180 days and automatically deleted after that.
- It is recommended that Edge be installed on an independent server to ensure collection stability and efficiency.
- Edge can collect performance data from up to 1,000 Linux servers at the same time. If there are 1,000 or more Linux servers to be collected, the server where Edge is installed must have at least 8 CPUs and 16 GB of memory with at least 8 GB available.
- Edge can collect performance data from up to 500 Windows servers at the same time. If there are 500 or more Windows servers to be collected, the server where Edge is installed must have at least 16 CPUs and 32 GB of memory with at least 8 GB available.

Prerequisites

- You have [manually added custom source resources](#) or [added discovered source resources](#).
- You have [installed Edge](#) in the source intranet environment and have connected Edge to MgC.
- You have [added source server credentials](#) to Edge.

Procedure

Step 1 Sign in to the [MgC console](#).

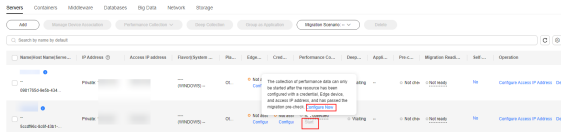
- Step 2** In the navigation pane on the left, choose **Research > Applications**. Select the created **migration project** in the upper left corner of the page.
- Step 3** In the application list, click the application name.
- Step 4** Configure an Edge device and credentials for the servers whose performance data needs to be collected.
- If the **Start** button in the **Performance Collection** column is dimmed, move the cursor to the **Start** button. In the dialog box that is displayed, click **Configure Now**.
- 
- If the **Start** button in the **Performance Collection** column is available, the configuration is complete. In this case, skip this step and go to **step 7**.
- Step 5** Configure the parameters listed in **Table 2-23**.

Table 2-23 Parameters for configuring a migration pre-check

Parameter	Configuration
Type	Set this parameter based on the source server OS type.
Edge Device	Select the Edge device in the source environment.
IP Address	Select the IP address used for accessing the source server. It can be a public or private IP address. If you need to use a proxy to access the server, enter the proxy IP address. After the migration pre-check passes, the IP address will be used for subsequent migration.
Port	Enter the port on the source server opened to the Edge device. <ul style="list-style-type: none"> • By default, port 5985 on Windows source servers must be opened to the Edge device. The port cannot be changed. • By default, port 22 on Linux source servers must be opened to the Edge device. You can specify a different port if needed.
Credential	Select the server credential. If the credential has not been added to MgC, go to the Edge console, add the server credential to Edge, and synchronize it to MgC.

- Step 6** Click **Confirm**. The system will verify the correctness of the configuration.
- Step 7** After the configuration is verified, click **Start** in the **Performance Collection** column to start collecting server performance data. The collection status will change to **Collecting**.

After performance data collection starts, you can:

- View the collected data.
 - a. Click a server name to go to its details page. In the **Performance Info** area, you can view the collected performance data. The maximum values in 7 days and 30 days are hourly aggregated data. To view these maximum values, ensure the collection duration exceeds 1 hour.
 - b. Click **View** in the **Operation** column to view the details and line chart about the performance metric in the collection period.
- Stop the collection.
Click **Stop** to pause performance data collection.

----End

2.5.5 Viewing Application Dependencies

To assist you in creating migration plans and designing architectures for the target environment, MgC organizes the relationships between your resources and applications. It then represents these technical architectures and dependencies into graphs.

Prerequisites

You have [imported application associations](#) or [imported discovery results](#).

Viewing the Technical Architecture

- Step 1** On the **Applications** page, click **Technical Architecture** in the **Application** card, and view a matrix of all discovered services, microservices, and resources.
- Step 2** Right-click a service and view its technical architecture, dependencies, and microservices.

----End

Viewing Applications

On the **Applications** page, under **Applications**, you can view all applications in the current migration project. In the application list, you can view the application name, type, business domain as well as the number of involved microservices, downstream applications, and upstream applications.

- To view all microservices contained in an application, click the number in the **Microservices** column.
- To view all applications that an application relies on, click the number in the **Upstream Applications** column.
- To view all applications that an application is relied on, click the number in the **Downstream Applications** column.
- To view what microservices and resources are used by an application as well as their layers and associations, click **Technical Architecture** in the **Operation** column. In the displayed technical architecture, click a microservice or resource node to view its details.
- To view the associations between an application and its upstream and downstream applications, you can click **Dependency Map** in the **Operation**

column. To view the details about this service and its upstream and downstream services, click its box.

Viewing Resource Candidates

Step 1 On the **Application Discovery** page, click **Candidates** in the **Source Resources** card.

Step 2 On the **Resources** tab, view the list of all collected resources and their details.

- To view the associations between a service and its upstream and downstream services, you can click **Service Dependencies** in the **Operation** column.
- To delete a service, click **Delete** in the **Operation** column.

----End

Viewing Microservices

Step 1 On the **Applications** page, click **Candidates** in the **Source Resources** pane.

Step 2 Click the **Microservices** tab to view the list of all collected microservices.

- To view the layer of a microservice and its associations with other resources, click **Technical Architecture** in the **Operation** column. In the displayed technical architecture, click a microservice or resource node to view its details.
- To view the associations between a microservice and its upstream and downstream services, choose **More > Service Dependencies** in the **Operation** column. To view the details about this microservice and its upstream and downstream services, click its box.
- To delete a microservice, click **More > Delete** in the **Operation** column.

----End

Exporting Application Dependencies

On the **Applications** page, click **Export** in the **Applications** card to export the access-layer call chains, database dependencies, middleware dependencies, and application dependencies for further analysis.

2.6 Big Data Lineage

2.6.1 Installing Edge

Before using the big data lineage function, you need to deploy Edge on a server that can access your metadata source.

 **CAUTION**

Edge does not support automatic restart. Do not restart Edge during task execution, or tasks will fail.

Procedure

Step 1 [Install Edge](#).

Step 2 [Connect Edge to MgC](#).

Step 3 [Add credentials for your big data resources](#) to Edge.

----End

2.6.2 Collecting Metadata

2.6.2.1 Creating a Metadata Connection

Create a connection to your metadata source, so you can collect source metadata to extract the list of databases and tables.

You can create connections to big data cloud services and components listed in [Table 2-24](#).

Table 2-24 Supported metadata sources

Type	Metadata Source
Big data components	<ul style="list-style-type: none">• Hive Metastore• Doris• HBase• ClickHouse• Delta Lake (with metadata)• Delta Lake (without metadata)• Hudi (with metadata)• Hudi (without metadata)
Big data cloud services	<ul style="list-style-type: none">• MaxCompute• ApsaraDB for ClickHouse

NOTICE

- Before creating a connection to Hive Metastore, you need to obtain the IP address and port required for connecting to Hive Metastore
- Before creating a connection to MaxCompute, you need to obtain the endpoint for the region where your MaxCompute resources are hosted.
- Before creating a connection to Doris, you need to obtain the IP address and port required for accessing the Doris cluster
- Before creating a connection to HBase, you need to obtain the IP address and connection port of at least one ZooKeeper node in the HBase cluster.

Prerequisites

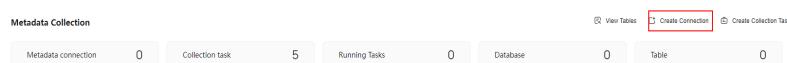
You have **installed Edge** on a server in the source environment.

Procedure

Step 1 Sign in to the **MgC console**.

Step 2 In the navigation pane on the left, choose **Research > Data Lineage**. Select a **migration project** in the upper left corner of the page.

Step 3 In the **Metadata Collection** area, click **Create Connection**.



Step 4 Select a connection type and click **Next**.

Step 5 Based on the selected connection type, configure connection parameters.

- [Parameters for creating a connection to Hive Metastore](#)
- [Parameters for creating a connection to Doris](#)
- [Parameters for creating a connection to HBase](#)
- [Parameters for creating a ClickHouse connection](#)
- [Parameters for creating a connection to Delta Lake \(with metadata\)](#)
- [Parameters for creating a connection to Delta Lake \(without metadata\)](#)
- [Parameters for creating a connection to Hudi \(with metadata\)](#)
- [Parameters for creating a connection to Hudi \(without metadata\)](#)
- [Parameters for creating a connection to MaxCompute](#)
- [Parameters for creating a connection to ApsaraDB for ClickHouse](#)

Table 2-25 Parameters for creating a connection to Hive Metastore

Parameter	Configuration
Connection To	You only need to create a metadata connection to the source.
Connection Name	The default name is Hive-Metastore-4 random characters (including letters and numbers). You can also customize a name.
Edge Device	Select the Edge device in the source environment.

Parameter	Configuration
Secure Connection	Determine whether to enable secure connection. <ul style="list-style-type: none"> If Hive Metastore is deployed in an unsecured cluster, do not enable secure connection. If Hive Metastore is deployed in a secured cluster, enable secure connection and provide access credentials. For details about how to obtain and add credentials to MgC, see "Big data - Hive Metastore" in Adding Resource Credentials.
Hive Version	Select the Hive version at the source. CAUTION If the source Hive version is 2.1.1, select 1.x.
Hive Metastore IP Address	Enter the IP address for connecting to the Hive Metastore node.
Hive Metastore Thrift Port	Enter the port for connecting to the Hive Metastore Thrift service. The default port is 9083 .

Table 2-26 Parameters for creating a connection to Doris

Parameter	Configuration
Connection To	You only need to create a metadata connection to the source.
Connection Name	The default name is Doris-4 random characters (including letters and numbers). You can also customize a name.
Edge Device	Select the Edge device in the source environment.
Doris Credential	Select the Doris credential added to the Edge device. For details about how to add credentials, see "Big data - Doris" in Adding Resource Credentials .
Database IP Address	Enter the IP address for accessing the Doris cluster.
Database Port	Enter the port used for accessing the Doris cluster. The default value is 3306.
Database Name	Enter the name of the Doris database.

Table 2-27 Parameters for creating a connection to HBase

Parameter	Configuration
Connection To	You only need to create a metadata connection to the source.
Connection Name	The default name is HBase-4 random characters (including letters and numbers). You can also customize a name.
Edge Device	Select the Edge device in the source environment. CAUTION You need to configure /etc/hosts on the server where the Edge is installed, so the HBase metadata connection can be established. For more information, see Preparing for Development and Operating Environments .
HBase Credential	Select the HBase credential added to the Edge device. For details about how to add credentials, see "Big data - HBase" in Adding Resource Credentials .
Secured Cluster	Choose whether the cluster is secured.
ZooKeeper IP Address	Enter the IP address for connecting to the ZooKeeper node. You can enter the public or private IP address of the ZooKeeper node.
ZooKeeper Connection Port	Enter the port for connecting to the ZooKeeper node.
HBase Version	Select the HBase version.

Table 2-28 Parameters for creating a connection to ClickHouse

Parameter	Configuration
Connection To	You only need to create a metadata connection to the source.
Connection Name	The default name is ClickHouse-4 random characters (including letters and numbers). You can also customize a name.
Edge Device	Select the Edge device in the source environment.
ClickHouse Credential (Optional)	Select the ClickHouse credential added to Edge. For details about how to add credentials, see "Big data - ClickHouse" in Adding Resource Credentials .
Secured Cluster	Choose whether the cluster is secured.
ClickHouse IP Address	Enter the IP address of the server that hosts ClickHouse.

Parameter	Configuration
HTTP Port	If the ClickHouse cluster is unsecured, enter the HTTP port for communicating with the ClickHouse server. The default value is 8123.
HTTP SSL/TLS Port	If the ClickHouse cluster is secured, enter the HTTPS port for communicating with the ClickHouse server.

Table 2-29 Parameters for creating a connection to Delta Lake (with metadata)

Parameter	Configuration
Connection To	You only need to create a metadata connection to the source.
Connection Name	The default name is Delta-Lake-with-metadata-4 random characters (including letters and numbers). You can also customize a name.
Edge Device	Select the Edge device in the source environment.
Executor Credential	Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in Adding Resource Credentials .
Executor IP Address	Enter the IP address for connecting to the executor.
Executor Port	Enter the port for connecting to the executor.
Spark Client Directory	Enter the installation directory of the Spark client.
Environment Variable Address	Enter the absolute path of the environment variable file (configuration file), for example, /opt/bigdata/client/bigdata_env .
SQL File Location	Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory. NOTICE After the migration is complete, you need to manually clear the folders generated at this location to release storage space.

Table 2-30 Parameters for creating a connection to Delta Lake (without metadata)

Parameter	Configuration
Connection To	You only need to create a metadata connection to the source.

Parameter	Configuration
Connection Name	The default name is Delta-Lake-without-metadata-4 random characters (including letters and numbers). You can also customize a name.
Edge Device	Select the Edge device in the source environment.
Executor Credential	Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in Adding Resource Credentials .
Executor IP Address	Enter the IP address for connecting to the executor.
Executor Port	Enter the port for connecting to the executor.
Spark Client Directory	Enter the installation directory of the Spark client.
Environment Variable Address	Enter the absolute path of the environment variable file (configuration file), for example, /opt/bigdata/client/bigdata_env .
SQL File Location	Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory. NOTICE After the migration is complete, you need to manually clear the folders generated at this location to release storage space.

Table 2-31 Parameters for creating a connection to Hudi (with metadata)

Parameter	Configuration
Connection To	You only need to create a metadata connection to the source.
Connection Name	The default name is Hudi-with-metadata-4 random characters (including letters and numbers). You can also customize a name.
Edge Device	Select the Edge device in the source environment.
Executor Credential	Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in Adding Resource Credentials .
Executor IP Address	Enter the IP address for connecting to the executor.
Executor Port	Enter the port for connecting to the executor.
Spark Client Directory	Enter the installation directory of the Spark client.

Parameter	Configuration
Environment Variable Address	Enter the absolute path of the environment variable file (configuration file), for example, /opt/bigdata/client/bigdata_env .
SQL File Location	Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory. NOTICE After the migration is complete, you need to manually clear the folders generated at this location to release storage space.

Table 2-32 Parameters for creating a connection to Hudi (without metadata)

Parameter	Configuration
Connection To	You only need to create a metadata connection to the source.
Connection Name	The default name is Hudi-without-metadata-4 random characters (including letters and numbers). You can also customize a name.
Edge Device	Select the Edge device in the source environment.
Executor Credential	Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in Adding Resource Credentials .
Executor IP Address	Enter the IP address for connecting to the executor.
Executor Port	Enter the port for connecting to the executor.
Spark Client Directory	Enter the installation directory of the Spark client.
Environment Variable Address	Enter the absolute path of the environment variable file (configuration file), for example, /opt/bigdata/client/bigdata_env .
SQL File Location	Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory. NOTICE After the migration is complete, you need to manually clear the folders generated at this location to release storage space.

Table 2-33 Parameters for creating a connection to MaxCompute

Parameter	Configuration
Connection To	You only need to create a metadata connection to the source.
Connection Name	The default name is MaxCompute-4 random characters (including letters and numbers). You can also customize a name.
Edge Device	Select the Edge device in the source environment.
Alibaba Cloud Credential	Select the credential of the source Alibaba Cloud account. For details about how to add credentials, see "Big data - MaxCompute" in Adding Resource Credentials .
MaxCompute Project	Enter the name of the MaxCompute project to be collected. You can obtain the project name from the MaxCompute console.
Endpoint	Enter the endpoint of the region where the MaxCompute project is located. For details about the MaxCompute endpoints in different regions, see MaxCompute Endpoints .

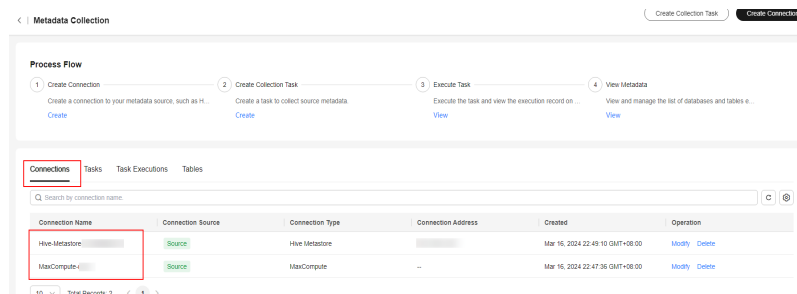
Table 2-34 Parameters for creating a connection to ApsaraDB for ClickHouse

Parameter	Configuration
Connection To	You only need to create a metadata connection to the source.
Connection Name	The default name is ApsaraDB for ClickHouse-4 random characters (including letters and numbers). You can also customize a name.
Edge Device	Select the Edge device in the source environment.
ClickHouse Credential	Select the ApsaraDB for ClickHouse credential added to Edge. For details about how to add credentials, see "Big data - ClickHouse" in Adding Resource Credentials .
Database URL	Enter the public address of the source ClickHouse cluster. You can view the IP address in the cluster details.

Step 6 Click **Test**. MgC verifies whether the connection can be established using the configuration information. If the test is successful, the connection can be established.

Step 7 After the connection test is successful, click **Confirm**. The metadata connection is created.

Step 8 Click **Metadata connections** in the **Metadata Collection** area. On the **Connections** tab, you can view the list of created metadata connections and their basic information. Locate the connection you created and in the **Operation** column, click **Modify** to modify the connection settings.



----End

2.6.2.2 Creating a Metadata Collection Task

Use the created metadata connection to create a collection task that gathers the details about source databases, tables, and fields to MgC.

You can create metadata collection tasks for:

- Hive Metastore
- Doris
- HBase
- ClickHouse
- Hudi (with metadata)
- Hudi (without metadata)
- MaxCompute
- ApsaraDB for ClickHouse

You can also add metadata about tables manually or by importing a file. For details, see [Viewing Metadata](#).

Prerequisites

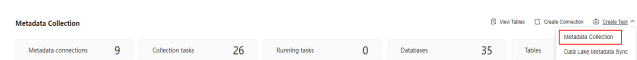
You have [created a metadata connection](#).

Procedure

Step 1 Sign in to the **MgC** console.

Step 2 In the navigation pane on the left, choose **Research > Data Lineage**. Select a **migration project** in the upper left corner of the page.

Step 3 In the **Metadata Collection** area, choose **Create Task > Metadata Collection**.



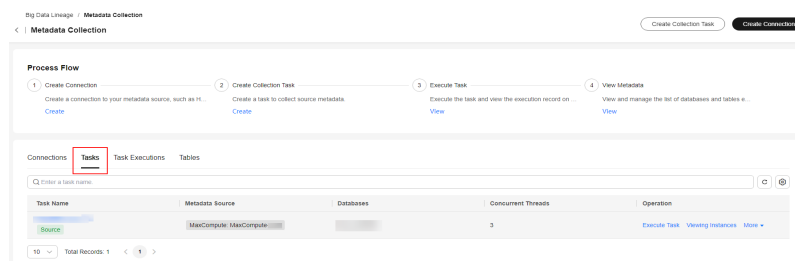
Step 4 Set task parameters based on [Table 2-35](#).

Table 2-35 Parameters for configuring a metadata collection task

Parameter	Configuration
Task Name	The default name is Metadata-Collection-4 random characters (including letters and numbers). You can also specify a name.
Metadata Connection	Select the created metadata connection .
Databases	Enter the names of the databases whose metadata needs to be collected. NOTICE This parameter is mandatory only if a MaxCompute metadata connection is selected. In other cases, it is optional. If it is left blank, the metadata of all databases is collected.
Concurrent Threads	Set the number of concurrent threads for executing the collection. The default value is 3 . The value ranges from 1 to 10 . Configuring more concurrent threads means more efficient collection, but more connection and Edge device resources will be consumed.

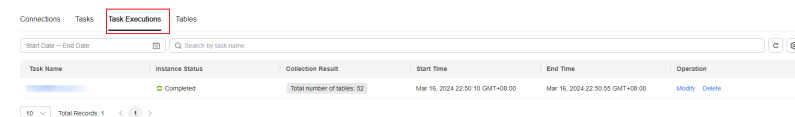
Step 5 Click **Confirm**. The metadata collection task is created.

Step 6 Click **Collection tasks**. Under **Tasks**, you can review the created metadata collection task and its settings. You can modify the task by choosing **More** > **Modify** in the **Operation** column.

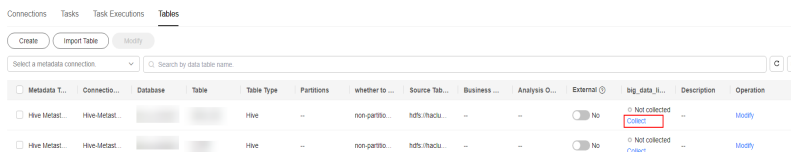


Step 7 Click **Execute Task** in the **Operation** column to run the task. Each time the task is executed, a task execution is generated.

Step 8 Click **View Executions** in the **Operation** column. Under **Task Executions**, you can view the execution records of the task and the status and collection result of each task execution. When a task execution enters a **Completed** status and the collection results are displayed, you can view the list of databases and tables extracted from collected metadata on the **Tables** tab.



Step 9 Locate a table and click **Collect** in the **Lineage** column to **create a lineage collection task**.



----End

2.6.2.3 Creating a Data Lake Metadata Collection Task

Use the created metadata connection to create a collection task that gathers the details about source databases, tables, and fields to MgC. Only Delta lakes with metadata are supported.

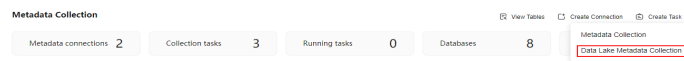
For Delta lakes without metadata, you can manually add information about database tables one by one or import them in a batch. For details, see [Viewing Metadata](#).

Prerequisites

You have [created a connection to Delta Lake \(with metadata\)](#).

Procedure

- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane on the left, choose **Research > Data Lineage**. Select a [migration project](#) in the upper left corner of the page.
- Step 3** In the **Metadata Collection** area, choose **Create Task > Data Lake Metadata Collection**.



- Step 4** Set task parameters based on [Table 2-36](#).

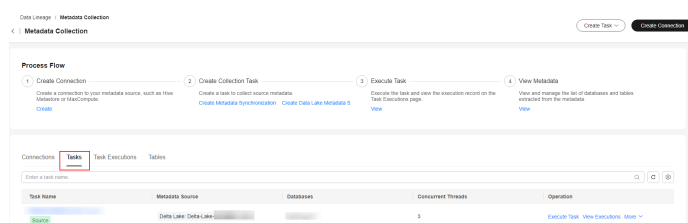
Table 2-36 Parameters for configuring a metadata collection task

Parameter	Configuration
Task Name	The default name is Data-Lake-Metadata-Sync-Task-4 random characters (including letters and numbers). You can also specify a name.
Metadata Connection	Select the created connection to Delta Lake (with metadata) .
Databases	Enter the names of the databases whose metadata needs to be collected.

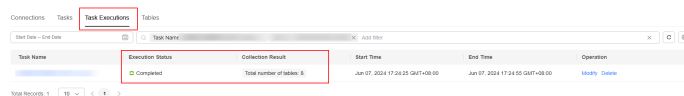
Parameter	Configuration
Concurrent Threads	Set the maximum number of threads for executing the collection. The default value is 3 . The value ranges from 1 to 10 . Configuring more concurrent threads means more efficient collection, but more connection and Edge device resources will be consumed.
Custom Parameters	<p>You can configure custom parameters to specify the tables and partitions to collect or set criteria to filter tables and partitions.</p> <ul style="list-style-type: none"> • If the metadata source is Alibaba Cloud EMR, add the following parameter: <ul style="list-style-type: none"> - Parameter: <code>conf</code> - Value: <code>spark.sql.catalogImplementation=hive</code> • If the source is Alibaba Cloud EMR Delta Lake 2.2 and is accessed through Delta Lake 2.3, add the following parameters: <ul style="list-style-type: none"> - Parameter: <code>master</code> - Value: <code>local</code> • If the source is Alibaba Cloud EMR Delta Lake 2.1.0 and Spark 2.4.8 is configured to process Delta Lake data, add the following parameters: <ul style="list-style-type: none"> - Parameter: <code>mgc.delta.spark.version</code> - Value: <code>2</code> • If the source is Alibaba Cloud EMR and Spark 3 is configured to process Delta Lake data, add the following parameters: <ul style="list-style-type: none"> - Parameter: <code>jars</code> - Value: <code>'/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-core_2.12-*.jar,/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-storage-*.jar'</code> <p>CAUTION Replace the parameter values with the actual environment directory and Delta Lake version.</p>

Step 5 Click **Confirm**. The metadata collection task is created.

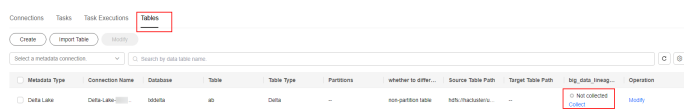
Step 6 Click **Collection tasks**. Under **Tasks**, you can review the created metadata collection task and its settings. You can modify the task by choosing **More** > **Modify** in the **Operation** column.



- Step 7** Click **Execute Task** in the **Operation** column to run the task. Each time the task is executed, a task execution is generated.
- Step 8** Click **View Executions** in the **Operation** column. Under **Task Executions**, you can view the execution records of the task and the status and collection results of each task execution. When a task execution enters a **Completed** status and the collection results are displayed, you can view the list of databases and tables extracted from collected metadata on the **Tables** tab.



- Step 9** Locate a table and click **Collect** in the **Lineage** column to **create a lineage collection task**.



----End

2.6.2.4 Viewing Metadata

You can collect metadata about databases and tables by creating a collection task or manually adding or importing metadata to MgC.

Creating a Collection Task

For details about how to create a collection task, see [Creating a Metadata Collection Task](#). When a task execution enters a **Completed** status and the collection results are displayed, you can view the list of databases and tables extracted from collected metadata on the **Tables** tab.

Manually Adding a Table

- Step 1** Sign in to the **MgC** console.
- Step 2** In the navigation pane on the left, choose **Research > Data Lineage**. Select a **migration project** in the upper left corner of the page.
- Step 3** In the **Metadata Collection** area, click **View Tables**.
- Step 4** On the displayed page, click **Add**.
- Step 5** Configure the parameters listed in [Table 2-37](#).

Table 2-37 Parameters for adding a table

Parameter	Description
Metadata Connection	Select the created metadata connection .
Database	Enter a name.

Parameter	Description
Table	Enter a name.
Source Table Path (Optional) It is mandatory only if a Delta Lake connection is selected for Metadata Connection .	Enter the path for storing the data table in the source database.
Target Table Path (Optional) It is mandatory only if a Delta Lake connection (without metadata) is selected for Metadata Connection .	Enter the path for storing the data table in the target database.
Partition Info (Optional)	User-defined
Is Partitioned (Optional)	Specify whether the table is partitioned.
Business Owner (Optional)	You can specify the owner of the business that the data table belongs to.
Analysis Owner (Optional)	Specify the analysis owner of the table.
External	Set it as required. If the table is external, the consistency verification result of the table is not displayed.
Description (Optional)	Enter a table description.

Step 6 Click **Confirm**. Then you can view the table in the table list.

----End

Importing Tables

Step 1 Sign in to the **MgC** console.

Step 2 In the navigation pane on the left, choose **Research > Data Lineage**. Select a **migration project** in the upper left corner of the page.

Step 3 In the **Metadata Collection** area, click **View Tables**.

Step 4 On the displayed page, click **Import**.

Step 5 Select the **created metadata connection**.

Step 6 Click **Download** to download the import template to the local PC. Open the import template and fill in the template with the information of the tables to be added.

NOTICE

- A maximum of 10,000 tables can be imported at a time.
- The tables to be imported must come from the same metadata source.
- If a connection to Delta Lake (with metadata) is selected for **Metadata Connection**, the **source_path** parameter in the template is mandatory.
- If a connection to Delta Lake (without metadata) is selected for **Metadata Connection**, the **source_path** and **target_path** parameters in the template are mandatory.

Step 7 Go back to the console and click **Select File** to upload the populated template to MgC.

Step 8 Click **Confirm**. The system starts the import. A task execution record is generated for this import. The execution status represents the import status.

----End

2.6.3 Collecting Data Lineage

2.6.3.1 Overview

Collecting data lineage can capture relationships and dependencies between data elements. MgC can virtualize the collected data lineage into graphs.

The following describes the types of jobs data lineage can be collected from and the collection precautions.

Job Type	Collection Precaution
DataArts Studio jobs	You need to export DataArts Studio jobs to an OBS bucket on Huawei Cloud and assign the read and write permissions for the bucket to MgC.
SQL jobs	You need to export SQL jobs and upload them an OBS bucket on Huawei Cloud and assign the read and write permissions for the bucket to MgC.
Lineage template	You need to download the lineage template and fill it with your data.

2.6.3.2 Exporting Jobs

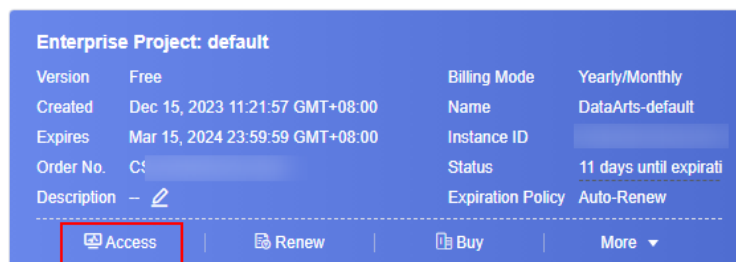
This section describes how to export data jobs from Huawei Cloud DataArts Studio and Alibaba Cloud DataWorks.

Exporting Jobs from Huawei Cloud DataArts Studio

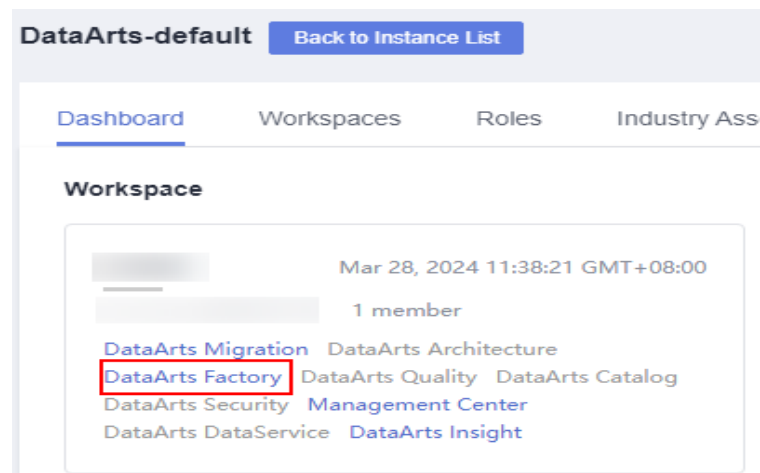
Step 1 Sign in to the [DataArts Studio](#) console.

Step 2 Select your instance, click **Access**, and locate the desired workspace.

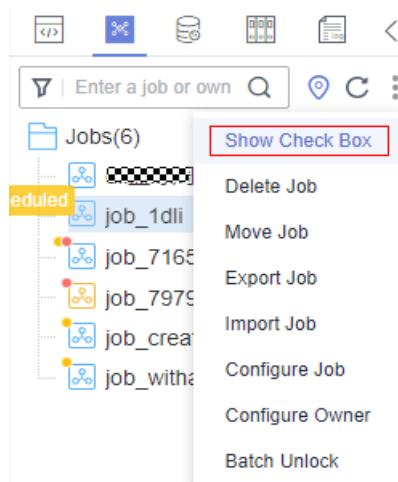
Available Instances



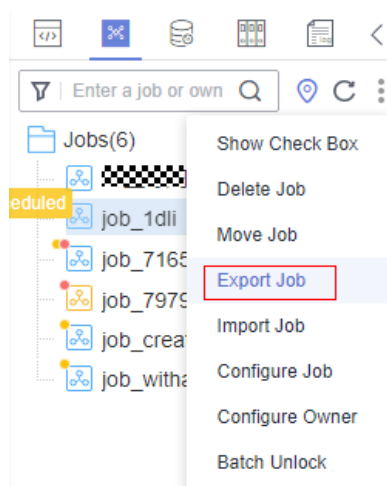
Step 3 Choose **DataArts Factory**.



Step 4 Click  in the job directory and choose **Show Check Box**.



Step 5 Select the jobs to be exported, click , and choose **Export Job**.



Step 6 Set **Export Mode** to **To OBS** and select a path for saving the jobs.

Step 7 Set **Export Scope** and **Job Status** as required.

NOTICE


If the job to be exported has not been submitted for any version, you are advised to set **Export Status** to **Developed**. If **Export Status** is set to **Submitted**, the job will be skipped during the export.

Step 8 Click **OK**. After the export is complete, go to the OBS directory selected in step 6 to obtain the exported package.

----End

Exporting Jobs from Alibaba Cloud DataWorks

Step 1 Sign in to the Alibaba Cloud DataWorks console. In the left navigation pane, choose **Data Modeling and Development > DataStudio**. On the displayed page, select the desired workspace from the drop-down list, and click **Go to DataStudio**.

Step 2 Click the  icon in the upper left corner and choose **All Products > More > Migration Assistant**.

Step 3 Create a full export task. For details, see [Creating and Viewing DataWorks Export Tasks](#).

----End

2.6.3.3 Creating a Lineage Collection Task

Prerequisites

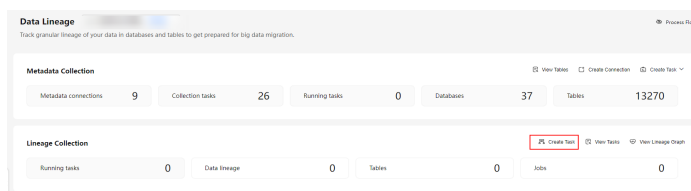
You have [collected metadata](#).

Procedure

Step 1 Sign in to the **MgC** console.

Step 2 In the navigation pane on the left, choose **Research > Data Lineage**. Select a [migration project](#) in the upper left corner of the page.

Step 3 In the **Lineage Collection** area, click **Create Task**.



Step 4 Select a job type and configure the parameters shown.

Type	Parameter	Configuration
Lineage template	File	<p>Download the lineage template to the local PC and set parameters in the template. The following fields are mandatory:</p> <ul style="list-style-type: none"> • Target Database (TargetDataset) • Target Table (TargetTable) • Target Connection Name (TargetConnectionName) • Target Component Type (TargetComponentType) • Upstream Database (SourceDataset) • Upstream Table (SourceTable) • Upstream Connection Name (SourceConnectionName) • Upstream Component Type (SourceComponentType) • Job ID (JobId) <p>NOTICE</p> <ul style="list-style-type: none"> • The value of Target Component Type and Upstream Component Type in the template can be Hive SQL or MaxCompute. • Cells in the template cannot contain formulas. Otherwise, the parsing will fail. <p>Go back to the console and click Select File to upload the saved file to MgC.</p> <p>CAUTION The file size cannot exceed 100 MB.</p>

- **Lineage template.**
 - a. Click **Download Template** to download the template to the local PC.
 - b. Complete the lineage template. The following parameters are mandatory:
 - Target Database (TargetDataset)
 - Target Table (TargetTable)
 - Target Connection Name (TargetConnectionName)
 - Target Component Type (TargetComponentType)
 - Upstream Database (SourceDataset)
 - Upstream Table (SourceTable)
 - Upstream Connection Name (SourceConnectionName)
 - Upstream Component Type (SourceComponentType)

- Job ID (JobId)

NOTICE

- The value of **Target Component Type** and **Upstream Component Type** in the template can be **Hive SQL** or **MaxCompute**.
- Cells in the template cannot contain formulas. Otherwise, the parsing will fail.

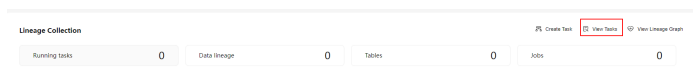
- c. Go back to the console and click **Select File** to upload the saved file to MgC.

CAUTION

The file size cannot exceed 100 MB.

Step 5 Click **Confirm**. The data lineage collection task is created. The system automatically starts collecting data lineage.

Step 6 Click **View Tasks**. On the displayed page, you can view the collection task in the task list.



Step 7 Wait until the task status changes to **Completed**. Then click **View Lineage** in the upper right corner of the page to view the **Lineage Graph**.

----End

2.6.3.4 Viewing Data Lineage

Prerequisites

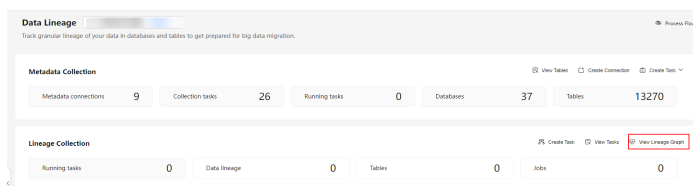
A **lineage collection task** has been completed.

Procedure

Step 1 Sign in to the **MgC** console.

Step 2 In the navigation pane on the left, choose **Research > Data Lineage**. Select a **migration project** in the upper left corner of the page.

Step 3 In the **Lineage Collection** area, click **View Lineage Graph**.



Step 4 On the displayed page, view the lineage graph by database and table. If big data verification is performed, you can also filter data by verification batch.

----End

2.7 Migration Solutions

2.7.1 Associating Source Servers with Target Servers

You can associate source servers with existing servers on Huawei Cloud. Then your workloads can be migrated to these Huawei Cloud servers.

For source servers with target servers associated, there is no need to **assess** them before you create workflows to execute migrations.

Prerequisites

You have finished resource discovery and collection by referring to **Simple Project**.

Notes

A target server must meet the following requirements:

- The target server must be stopped.
- During the migration, disks on the target server are formatted and re-partitioned based on the source disk settings for receiving data migrated from the source server.
- To migrate over the Internet, the target server must be able to access the Internet.
- The target server must be in the same region as the **application** to which the source server is added.

Procedure

Step 1 Sign in to the **MgC** console.

Step 2 In the navigation pane on the left, choose **Design > Migration Solutions**. Select a **migration project** in the upper left corner of the page.

Step 3 Click **View** in the **Target Configuration** card.

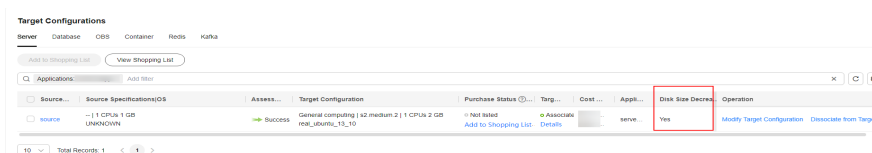
Step 4 On the displayed **Servers** tab, locate a source server and click **Associate** in the **Target Association** column.

Step 5 In the displayed dialog box, select the region of the **application** and select a project. You can select a target server based on the disk usage of the source server. This allows you to choose a target server with a smaller disk capacity or fewer disks than the source server, reducing disk capacity, optimizing resource utilization, and avoiding unnecessary costs.

NOTICE

- Disk downsizing is only available for Linux, and the decreased sizes must be larger than the used sizes of the source disks.
- In the cross-AZ migration scenario, only disk upsizing is supported. Even if you choose to downsize disks here, the settings will not be applied, and the system will create target disks as large as source disks.

Step 6 Click **OK**. After the association is complete, **Associated** appears in the **Target Association** column. You can click **Details** to view the specifications of the associated target server. The system will automatically check whether the associated target server has downsized disks compared with the source server. If it does, **Yes** will be displayed in the **Disk Downsized** column. If it does not, **No** will be displayed.



----End

Dissociating a Source Server from the Target Server

Step 1 On the **Servers** tab, locate the source server and click **Dissociate from Target** in the **Operation** column.

Step 2 In the displayed dialog box, click **Yes**. Please note that this operation cannot be undone.

----End

2.7.2 Getting Target Recommendations

Assessing an application can generate recommendations for rightsized Huawei Cloud resources based on the specifications, performance, and business purpose of the source resources added to the application. These recommendations also take into account your requirements for cost, availability, and compliance.

Target recommendations can be generated for servers, databases, object storage, containers, and middleware.

NOTE

If your source servers have been **associated with existing servers** on Huawei Cloud, you can skip this section and directly create a migration workflow to migrate them.

Prerequisites

You have **discovered resources**, and **grouped the resources as applications**.

Procedure

- Step 1** Sign in to the **MgC** console.
- Step 2** In the navigation pane on the left, choose **Design > Migration Solutions**. Select a **migration project** in the upper left corner of the page.
- On the **Migration Solutions** page, you can view how many source resources and applications are managed in the current migration project, as well as whether the source resources have been configured with target resources.
- Step 3** Click **Assess** in the **Target Configuration** card.
- Step 4** In the **Select Application** drop-down list, select the application you want to assess.
- Step 5** In the **Select Resources** area, select the application resources to be assessed.
- Step 6** Configure the policy used to compute target recommendations based on [Table 2-38](#).

Table 2-38 Settings used for computing target recommendations

Parameter	Description
Target Region	Select the region where you want to purchase resources on Huawei Cloud. You are advised to select a region close to your target users for lower network latency and quick access.
Assessment Policy	<ul style="list-style-type: none">Match source configuration MgC recommends the right Huawei Cloud resources based on source resource specifications.Match business scenario MgC recommends the right Huawei Cloud resources based on the business scenario of source resources and Huawei Cloud best practices.Cross-AZ migration This policy only applies to migration of ECSs between AZs on Huawei Cloud, and MgC only assesses servers in the application. You need to select the target AZ you want to migrate to. <p>For details about how the system recommends appropriate target resources, see How Does MgC Generate Target Recommendations?</p>
Priority	<ul style="list-style-type: none">High performance MgC recommends target resources with optimal performance.Low cost MgC recommends the most cost-effective target resources that meet your demands.

Parameter	Description
Preferences	<p>Configure your preferences for target servers. Your preferences will be first attempted to be matched during the assessment. For details about how the system recommends appropriate target resources, see How Does MgC Generate Target Recommendations?</p> <ul style="list-style-type: none"> • Server Types (Optional) Select the server types you prefer. • Server Series (Optional) Select the server series you prefer. The system will generate recommendations based on your preferred server types and series. <p>NOTICE If you select Display only series allowed on DeHs, Server Types will be dimmed, and the server series allowed on DeHs in the target region will be listed.</p> <ul style="list-style-type: none"> • System Disk (Optional) Select the system disk type you prefer. • Data Disk (Optional) Select the data disk type you prefer. • Sizing Criteria Choose the criteria that the system will use to generate server recommendations. <ul style="list-style-type: none"> - If you select As-in on source, the system will recommend target servers with the same or as close CPU and memory capacity as the source servers. - If you select Performance-based, you need to perform a performance collection for the source servers, and then set assessment parameters. The system will then recommend target servers with your desired CPU and memory capacity. <p>NOTICE The more performance data is collected, the more accurate the recommendations are. The collection of server performance data should take no less than seven days.</p>
	<p>For the container assessment, configure parameters such as Cluster Type, Cluster Version, and Container Network Model for getting recommendations for container resources.</p>

Step 7 Click **Create Assessment**. After the assessment is complete, you can [review the target recommendations](#). You can also [view the performance data of source servers](#).

Step 8 (Optional) Perform the following operations:

- [Modify target recommendations](#). You can modify the recommended specifications for target servers and their disks.

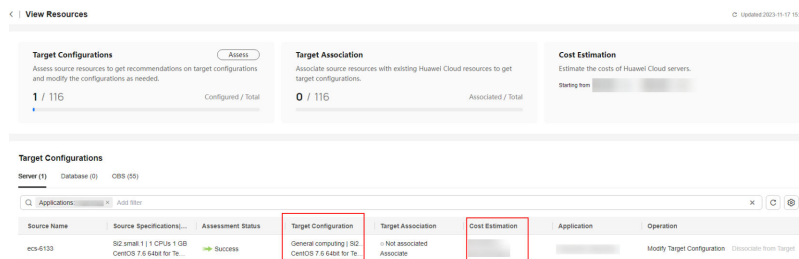
- **Associate source servers with target servers.** If you find that you already have servers that match your requirements on Huawei Cloud based on the target server recommendations, you can associate them with source servers.
- **Associate source servers with DeHs** if you want to migrate to Huawei Cloud DeH.

----End

Viewing Target Recommendations

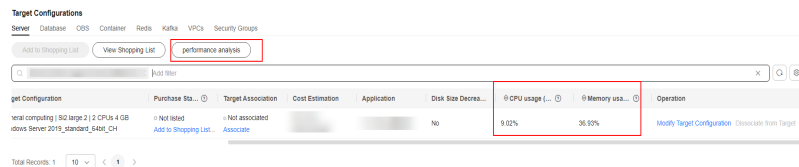
In the application list on the **Migration Solutions** page, click **View Target Configurations** in the **Operation** column.

In the **Target Configurations** area, you can view the specifications of Huawei Cloud resources recommended based on the source resource specifications and your preferences. It also gives you the ability to estimate what it will cost to run your services on Huawei Cloud.



Viewing Server Performance Data

On the **Target Configurations** page, in the server list, you can view the average CPU and memory usage of each server over the last 7 or 30 days. Click **Performance Analysis** to view the performance statistics of all servers.

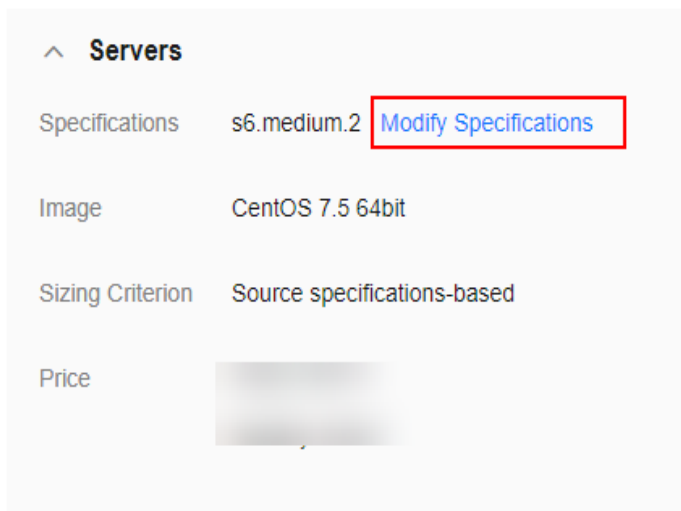


Modifying Target Recommendations

Step 1 In the **Target Configurations** area, locate the server that you want to modify the recommended target configurations for and click **Modify Target Configuration** in the **Operation** column.

Step 2 Modify the specifications and image for the target server.

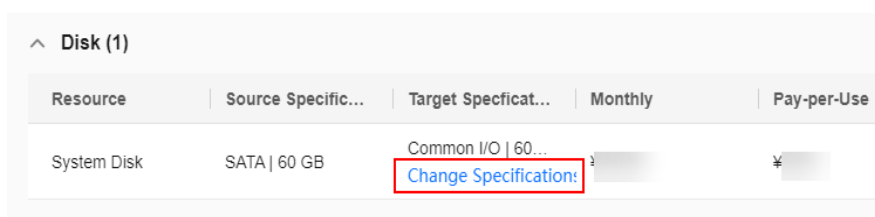
Target Configuration



Step 3 In the disk area, locate a disk and click **Modify Specifications** in the **Target Specifications** column. You can modify the disk type and capacity. You can downsize disks for Linux target servers based on the disk usage of the source servers. If you downsize a disk for the target server, the system will set **Disk Downscaled** to **Yes**. The reverse also applies.

NOTICE

- The system disk capacity ranges from 40 GB to 1,024 GB.
- The data disk capacity ranges from 10 GB to 32,768 GB.
- Disk downsizing is only available for Linux, and the decreased sizes must be larger than the used sizes of the source disks.
- In the cross-AZ migration scenario, only disk upsizing is supported. Even if you choose to downsize disks here, the settings will not be applied, and the system will create target disks as large as source disks.



----End

Associating Source Servers with DeHs

After you associate source servers with DeHs, the system will automatically provision the recommended target servers on the DeHs if you:

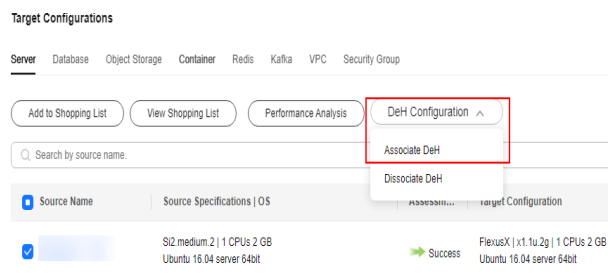
- Buy these recommended target servers using a shopping list.

- Create migration workflows to migrate these source servers.

Step 1 In the **Target Configurations** area, under **Server**, select the source server to be associated with the same DeH.

Step 2 Choose **DeH Configuration > Associate DeH** above the list.

Figure 2-31 Associating source servers with a DeH



Step 3 Select the target DeH to be associated from the drop-down list and click **Confirm**. **Associated** will show up in the **DeH** column. You can click **Details** to view the associated DeH.

----End

2.7.3 Purchasing Resources

After the specifications of target resources are confirmed, you can directly purchase these target resources in batches using a shopping list on MgC. Currently, only servers can be purchased this way. The purchased target servers will be automatically associated with the paired source servers. You can then manually redeploy your services on these target servers. Alternatively, you can create server migration workflows from the beginning to automate the entire purchase and service migration process.

Prerequisites

You have [got target recommendations](#).

Procedure

- Step 1** Sign in to the **MgC** console.
- Step 2** In the navigation pane on the left, choose **Design > Migration Solutions**. Select a **migration project** in the upper left corner of the page.
- Step 3** Click **View** in the **Target Configuration** card.
- Step 4** In the **Target Configurations** area, under **Server**, select a server whose **Assessment Status** is **Success**, and click **Add to Shopping List** in the **Purchase Status** column.
- Step 5** On the top of the page, click **View** in the **Shopping List** card.
- Step 6** In the **Process Flow** area, click **View Templates**. In the **My Templates** window that is displayed on the right, click **Create Template**.

Step 7 In the **Basic Info** area, select a template type (only server is supported currently) and specify a template name. In the **Configuration Info** area, set template parameters based on [Table 2-39](#).

Table 2-39 Parameters for configuring a shopping template

Parameter	Configuration
Region	Select the region where you want to deploy target servers.
Project	Select a project in the target region.
AZ	Random is the default setting. You can also select an AZ.
VPC	Select a VPC in the target region.
Subnet	Select a VPC subnet. The subnet CIDR block must be within the selected VPC CIDR block.
Security Group	Select a security group that meet the following requirements: <ul style="list-style-type: none">• Inbound ports 8899, 8900, and 22 are allowed for Windows migrations.• Inbound port 22 is allowed for Linux migrations
Enterprise Project	Select a commercial enterprise project that you want add purchased target servers to. The default enterprise project is default . An enterprise project makes it easy to manage projects and group cloud resources and users. For details about creating and managing enterprise projects, see the Enterprise Management User Guide .

Step 8 Click **Save**. You can view the created template in the template list.

Step 9 Return to the shopping list page, and click **Attach Shopping Template** in the **Shopping Template** column. In the displayed dialog box, select the created template from the drop-down list and click **Confirm**.

Step 10 Click **Buy** in the **Operation** column. Wait until the purchase status changes to **Purchased**, and view the ID of the purchased resource.

----End

2.7.4 Assessing Migration Risks

You can assess potential migration risks before performing a migration. The assessment results will indicate whether your source servers are compatible with the target cloud in terms of OS, firmware, and specifications.

NOTICE

Only servers can be assessed for migration risks.

Prerequisites

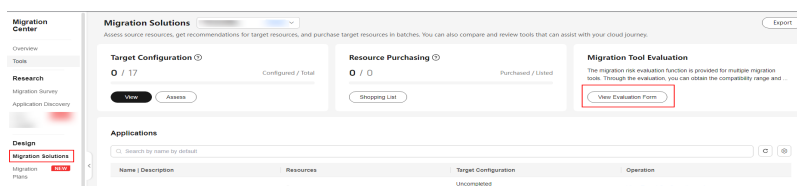
You have added source server information to MgC manually or through an Internet- or intranet- based discovery task.

Procedure

Step 1 Sign in to the **MgC console**.

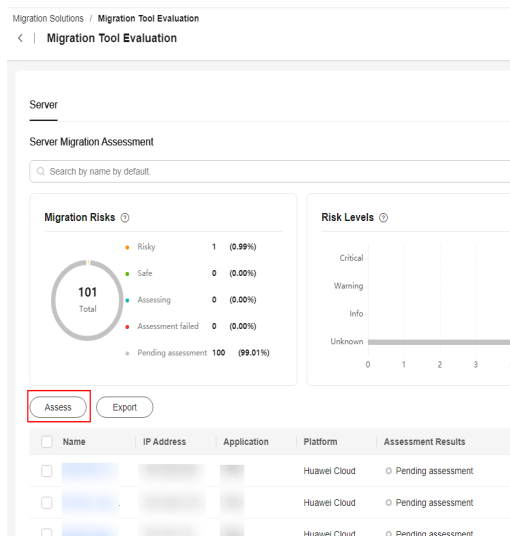
Step 2 In the navigation pane on the left, choose **Design > Migration Solutions**. Select a **migration project** in the upper left corner of the page.

Step 3 Click **View Evaluation List** in the **Migration Tool Evaluation** card.

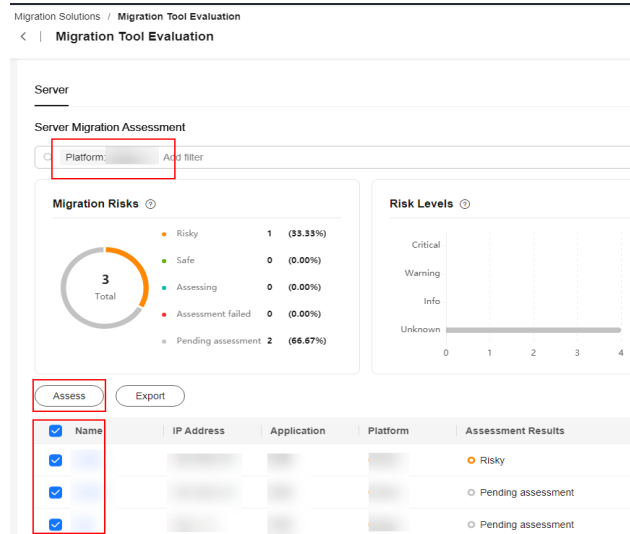


Step 4 On the **Server** tab, you can view the list of all source servers.

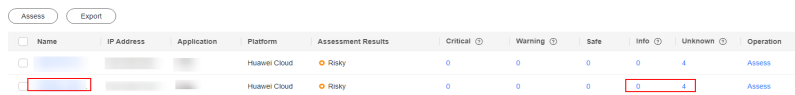
- To assess all servers in the **Pending assessment** state, click **Assess**. In the dialog box that is displayed, click **OK**.



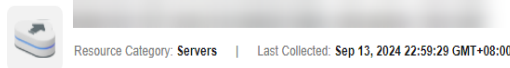
- To assess certain servers, search for them by name, IP address, platform, or application and select them. Click **Assess**. In the displayed dialog box, confirm the number of servers to be assessment and click **OK**.



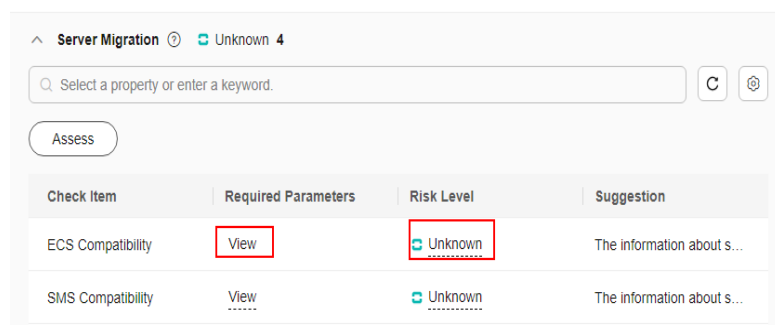
Step 5 In the assessment list, view the assessment status and the number of migration risks at each level. Click the server name or a number in the row. On the **Migration Risks** tab displayed on the right, view all check items, server information required for checking each item, and risk levels.



Resource Details



Source Migration Risks



Step 6 Rectify the migration risks on a server based on the suggestions provided by the system. Then click **Assess** in the **Operation** column to assess the server again.



----End

2.8 Migration Plans

2.8.1 Creating a Server Migration Plan

A server migration plan outlines the source servers to be migrated and the paired target servers. You can create a migration workflow on the top of a migration plan to implement batch migration. The following content describes how to create a server migration plan.

Preparations

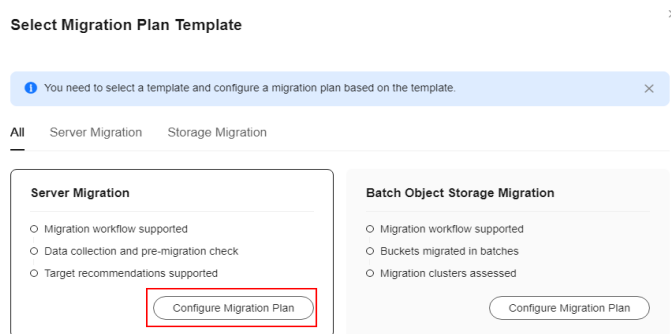
- [Create a migration project](#).
- Discover source servers and collect server details. MgC provides three collection methods to meet your requirements in different scenarios.
 - If your source servers are on a cloud platform, such as Alibaba Cloud, Huawei Cloud, AWS, Tencent Cloud, Google Cloud, or Azure, you can [collect the data about your servers over the Internet](#). You can also [manually add the server details to MgC](#).
 - If your source servers are in an on-premises IDC, you can [collect the server details over the intranet](#). MgC enables you to scan for servers by network range or VMware vCenter Server. You can also [manually add the server details to MgC](#).
- Install Edge in the source intranet environment and register an account. For details, see [Installing Edge for Windows](#). Then [connect Edge to MgC](#).

Notes and Constraints

- Only one migration workflow can be created for a migration plan.
- A server can only be added to one migration plan.
- A maximum of 100 servers can be added to a migration plan.

Procedure

- Step 1** Sign in to the [MgC console](#). In the upper left corner of the page, select the migration project you created.
- Step 2** In the navigation pane, choose **Design > Migration Plans**.
- Step 3** Click **Create Migration Plan** in the upper right corner of the page.
- Step 4** In the **Server Migration** card, click **Configure Migration Plan**.

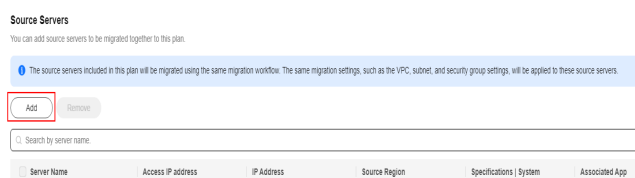


Step 5 In the **Basic Settings** area, set parameters listed in [Table 2-40](#).

Table 2-40 Basic settings

Parameter	Configuration
Migration Plan Name	User-defined
Description (Optional)	
Source Platform	Select the cloud platform where the source servers are located. NOTICE A migration plan can only include servers from the same platform.
Target Region	Select the region you want to migrate to.

Step 6 In the **Source Servers** area, click **Add**.



Step 7 Select the servers to be migrated together and click **Confirm**.

CAUTION

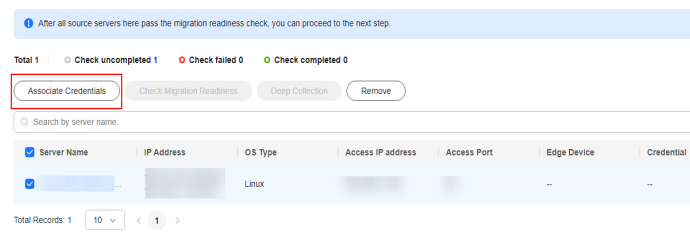
- The source servers included in this plan will be migrated using the same migration workflow. The same migration settings, such as the VPC, subnet, and security group settings, will be applied to these source servers.
- The selected servers must come from the source platform selected in [step 4](#).

Step 8 Click **Save and Next** to go to the **Check Source Servers** phase.

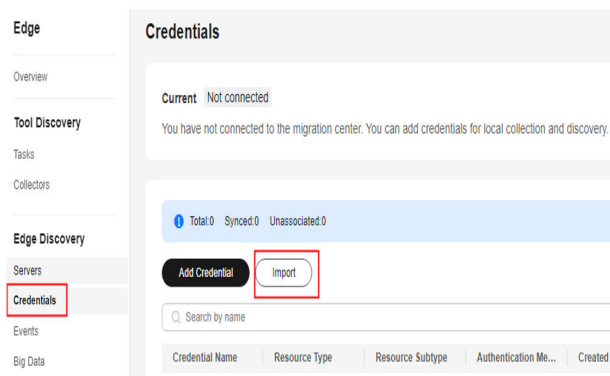
Step 9 Configure server credentials. There are two methods for you to do this:

- **Manual addition:** You can choose this method if you configure credentials for a small number of servers. For details, see [Adding Resource Credentials](#).

- **Batch addition:** You can choose this method if you configure credentials for a large number of servers.
 - a. Click **Associate Credentials** above the list of source servers to download the template for batch configuring credentials. Open the template file, enter the credential information (username and password) of all servers in the current migration plan, and save the file.

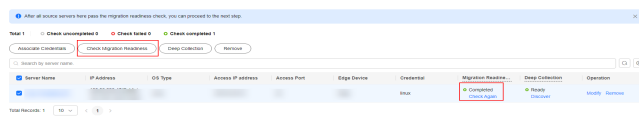


- b. Import the saved template file to the **Edge device you connect to MgC**. The system automatically configures the Edge device and credentials for the servers.



You can use **Modify** in the **Operation** column to update settings, such as **Access IP Address**, **Access Port**, **Edge Device**, and **Credential**.

Step 10 Select all the servers and click **Check Migration Readiness** above the list. The system checks if the source servers are ready for migration.



- If the **Migration Readiness Check** column displays a **Completed** status, the source server passes the check and is ready for migration.
- If the **Migration Readiness Check** column displays a **Check failed** status and the failure cause is that certain source server information is missing, click **Collect** in the **Deep Collection** column to collect the server details.
- If the **Migration Readiness Check** column displays a **Check failed** status and the failure cause is that the source server is unreachable, check whether the access information you provided is correct. If it is correct, check the migration readiness again.

Step 11 After **Completed** shows up in the **Migration Readiness Check** column for all the source servers, click **Next** to go to the optional phase **Conduct Performance Collection**.

Step 12 (Optional) Collect server performance data. The collected data can be used to get target server recommendations in the next step. A collection takes some time because performance data is sampled from source servers once every 5 minutes. You can determine whether to perform performance collection. For more constraints, see [Precautions for performance collection](#). If you do not need to collect server performance data, click **Next** to go to the **Configure Target** phase.

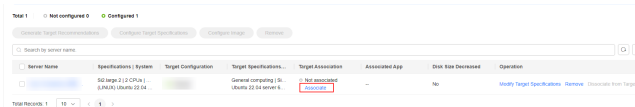
Select the source servers whose performance data needs to be collected and choose **Performance Collection > Start** above the list. **Collecting** will be displayed in the **Performance Collection** column

After the performance data collection is complete, you can:

- Click **View Performance** in the **Operation** column to view the collected server performance data.
- Choose **Performance Collection > Stop** above the list to suspend performance data collection for servers.

Step 13 Configure target servers. You can use the following methods to complete this job:

- **Associating source servers with target servers:** If you have cloud servers on Huawei Cloud, you can associate them with the source servers. Then in the migration workflow, these cloud servers will receive data and workloads migrated from the source servers. For requirements about your existing cloud servers (target servers), see [Associating Source Servers with Target Servers](#).
 - a. Locate a source server in the list, click **Associate** in the **Target Association** column.



Server Name	Specifications System	Target Configuration	Target Specifications	Target Association	Associated App	Disk Size Downscaled	Operation
...	General computing 50 Ubuntu 22.04 server 6	Not associated	-	No	View Target Specifications Details Associate

- b. In the displayed dialog box, select the region and project where the existing cloud servers are located. If the source server's storage disks are overprovisioned, regardless of the quantity or space, you can choose an existing cloud server that precisely fits your needs to optimize resource utilization and save costs.

NOTICE

- Ensure that the target server has an EIP bound.
 - Disk downsizing is only available for Linux, and the decreased sizes must be larger than the used sizes of the source disks.
 - In the cross-AZ migration scenario, only disk upsizing is supported. Even if you choose to downsize disks here, the settings will not be applied, and the system will create target disks as large as source disks.
- c. Click **Confirm**. After the association is complete, **Associated** shows up in the **Target Association** column. You can click **Details** to view the details of the associated target server. The system will automatically check whether the associated target server has downsized disks compared with

the source server. If it does, **Yes** will be displayed in the **Disk Downsized** column. If it does not, **No** will be displayed.

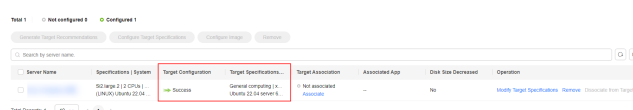
- **Generating target server recommendations:** You can choose to let the system recommend you rightsized Huawei Cloud servers based on the source server specifications. You can also manually adjust the recommended server specifications. In the subsequent migration workflow, the target servers will be automatically created based on the specifications configured here. Source servers with target servers associated will be skipped during the recommendation process.
 - a. In the source server list, select the ones that you want to generate target server recommendations for and click **Generate Target Recommendations** above the list.
 - b. Configure the policy used to compute target recommendations based on [Table 2-41](#).

Table 2-41 Settings used for computing target recommendations

Parameter	Description
Priority	<ul style="list-style-type: none"> ▪ High performance MgC recommends target servers with optimal performance. ▪ Low cost MgC recommends the most cost-effective target servers that meet your demands.

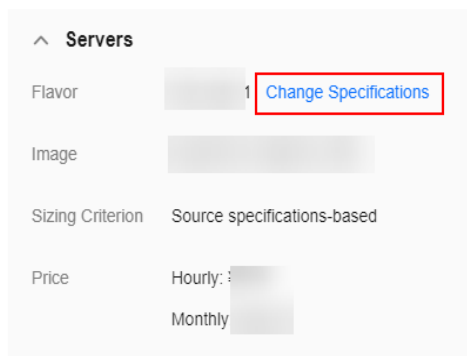
Parameter	Description
Preferences	<p>Configure your preferences for target servers. Your preferences will be the first attempted to be matched during the recommendation. For details about how the system recommends appropriate target resources, see How Does MgC Generate Target Recommendations?</p> <ul style="list-style-type: none"> ▪ Server Types (Optional) Select the server types you prefer. ▪ Server Series (Optional) Select the server series you prefer. The system will generate recommendations based on your preferred server types and series. <p>NOTICE If you select Display only series allowed on DeHs, Server Types will be dimmed, and the server series allowed on DeHs in the target region will be listed.</p> <ul style="list-style-type: none"> ▪ System Disk (Optional) Select the system disk type you prefer. ▪ Data Disk (Optional) Select the data disk type you prefer. ▪ Sizing Criteria Choose the criteria that the system will use to generate server recommendations. <ul style="list-style-type: none"> ○ If you select As-in on source, the system will recommend target servers with the same or as close CPU and memory capacity as the source servers. ○ If you select Performance-based, you need to perform a performance collection for the source servers, and then set assessment parameters. The system will then recommend target servers with your desired CPU and memory capacity. <p>NOTICE The more performance data is collected, the more accurate the recommendations are. The collection of server performance data should take no less than seven days.</p>

- c. Click **Confirm**. If **Success** shows up in the **Target Configuration** column, the target recommendation is generated. You can check the recommended configuration in the next column



- d. (Optional) Modify target server specifications recommended by the system if needed.
 - i. Locate a source server and click **Modify Target Specifications** in the **Operation** column.
 - ii. Modify the specifications and image for the target server.

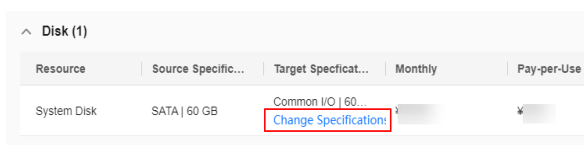
Recommendation



- iii. In the disk area, locate a disk and click **Modify** in the **Target Specifications** column to modify the disk type and capacity. Only disks on Linux target servers can be downsized if the paired source servers have over-provisioned storage resources. If you downsize a disk for the target server, the system will set **Disk Downized** to **Yes**. The reverse also applies.

NOTICE

- The system disk capacity ranges from 40 GB to 1,024 GB.
- The data disk capacity ranges from 10 GB to 32,768 GB.
- Disk downsizing is only available for Linux, and the decreased sizes must be larger than the used sizes of the source disks.
- In the cross-AZ migration scenario, only disk upsizing is supported. Even if you choose to downsize disks here, the settings will not be applied, and the system will create target disks as large as source disks.

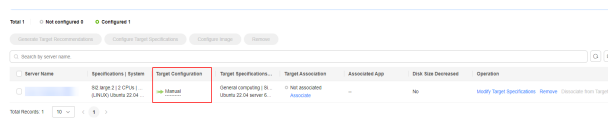


- **Configuring target server specifications:** You can manually configure the same target server specifications for the source servers all at once.

CAUTION

When selecting server specifications, it is crucial to ensure they meet your requirements. The system does not check whether they match the source servers. MgC does not assume responsibility for any issues arising from inappropriate server specifications.

- a. In the server list, select the source servers and click **Configure Target Specifications** above the list.
- b. Select the target server specifications and click **OK**. Then you can see **Target Configuration** changes to a **Manual** status.

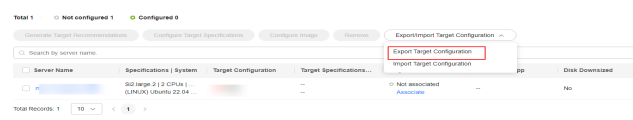


- **Configuring an image for target servers:** You can select an image to apply to all the target servers.

CAUTION

When selecting an image, it is crucial to ensure it meets your requirements. The system does not check whether it matches the source servers. MgC does not assume responsibility for any issues arising from inappropriate images.

- a. In the server list, select the source servers and click **Configure Image** above the list.
 - b. On the displayed page, choose an image type, an OS, and an OS version and click **Confirm**. If a target server has a system disk smaller than what defined in the image you choose, configuring the image will fail for that server.
- **Exporting and then importing target server configurations:** You can export the target server configurations, modify or configure the server, disk, and image settings, and then import the updated configurations back. Some technical expertise is needed for this process.
 - a. In the list of source servers, choose **Export/Import Target Configuration > Export Target Configuration** to download the server information to the local PC as an Excel file.



- b. Open the exported file. On the first sheet named **servers**, the blue columns (columns A to G) indicate the source server information, which **does not need to be modified**. The yellow columns (columns H to K) indicate the target server information, which **needs to be configured**.

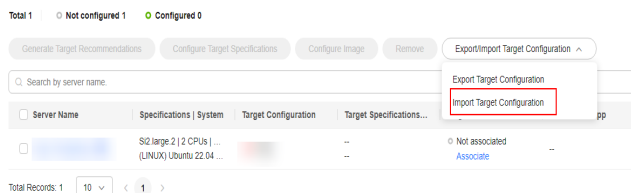
ID	name	connect_ip	cpu_cores	mem	os_type	os_info	error	diskname	disk_type	image_type	image
UAD1	example		4	4G	Linux	Red Hat Enterprise Linux (3 target)		/dev/vda	public	Public-CAD-HCE-BasicTemplate-2.0.24061.v85_04-stan	

- c. Configure the target server information (in columns H to K) according to [Table 2-42](#).

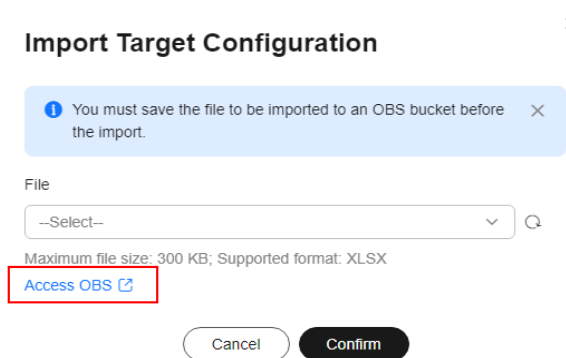
Table 2-42 Parameters in columns H to K

Parameter	Configuration
flavor	<p>Enter the flavor name for the target server. The second sheet flavors lists the flavors of S- (general-purpose) and C- (computing-plus) series on sale in the target region. Choose a proper flavor and copy the flavor name to this cell.</p> <p>NOTE If a source server has been assessed, the recommended flavor is included in the exported file. If a source server has not been assessed, its flavor field is empty.</p>
disks(name,osDisk,type,capacity;)	<p>Enter the information about all disks. Separate multiple disks with semicolons (;). You must specify the name, function (system or not), type, and size for each disk. Separate these items with commas (,). Please keep in mind that the disk size is a number without unit. The default unit is GiB.</p> <p>Example: /dev/sda,true,SAS,1024;/dev/sdb,false,SAS,2046</p> <p>NOTE If a source server has been assessed, the recommended disk specifications show up in the exported file. If a source server has not been assessed, the source disk specifications are used, except the disk type. The target disk type defaults to SAS.</p>
image_type	<p>Enter the image type. The options are:</p> <ul style="list-style-type: none"> ▪ public: public image ▪ private: private image ▪ shared: shared image
image	<p>Enter the image name. You can view all available images in the target region on the third sheet images.</p>

- d. After configuring the target server information for all source servers, save the Excel file. Return to the MgC console. Choose **Export/Import Target Configuration > Import Target Configuration** above the list of source servers.



- e. In the displayed dialog box, click **Access OBS** to go to the OBS page.



- f. Select a bucket and upload the Excel file to the bucket.
- g. After the upload is successful, return to the MgC console. In the **Import Target Configuration** dialog box, select the file stored in the OBS bucket from the drop-down list.
- h. Click **Confirm** to import the target server configurations.

NOTE

- If the **flavor** parameter is empty in a row, this row will be ignored during the import.
 - If the **disk** or **image** parameter is left empty in a row, the source server's disk and image information is used during the import.
 - If the number in the **disk** field of a row is inconsistent with what the source server actually has, an error message is reported, indicating that the disk numbers are inconsistent.
 - If in a row, the disk type conflicts with the flavor, an error message is displayed, indicating that the disk type is incorrect.
- **Associating source servers with DeHs** if you want to migrate to Huawei Cloud DeH. Then after you create a migration workflow for this plan, the system will provision the recommended target servers on the DeHs.
 - a. In the source server list, select the ones to be associated with a DeH.
 - b. Choose **DeH Configuration > Associate DeH** above the list.
 - c. Select the target DeH to be associated from the drop-down list and click **Confirm**. **Associated** will show up in the **DeH** column. You can click **Details** to view the associated DeH.

Step 14 Perform subsequent operations as needed.

- Create a server migration workflow.
Click **Create Workflow** to create a migration workflow. For more information, see [Step 5](#).

- Only save the migration plan.
Click **Confirm** to save the migration plan. Then you can:
 - Click **Design** in the **Operation** column to modify the migration plan.
 - Click **Create Workflow** in the **Operation** column to create a server migration workflow to migrate the source servers included in the migration plan. For more information, see [Step 5](#).

----End

2.8.2 Creating a Batch Storage Migration Plan

You can configure migration plans using templates designed for different resources and create migration workflows on the top of these plans. You can also view the migration settings for resources by application. Follow this section to configure a migration plan for batch migrating object storage buckets.

If only one object storage bucket needs to be migrated, you can [create a migration workflow](#) directly.

Prerequisites

- Source buckets have been discovered over the Internet and their details have been collected.
- (Optional) A deep collection has been performed for the buckets to be migrated.

Notes

- A migration plan can be used to migrate buckets from the same source platform and to the same target region.
- A source bucket can be included in multiple migration plans.
- Source buckets in a migration plan may have different prefixes. You can give them the same prefix after they are migrated to the target bucket.

Procedure

- Step 1** Sign in to the [MgC console](#). In the navigation pane, choose **Design > Migration Plans**.
- Step 2** Click **Create Migration Plan** in the upper right corner of the page.
- Step 3** In the **Batch Object Storage Migration** card, click **Configure Migration Plan**.
- Step 4** In the **Basic Settings** area, set parameters listed in [Table 2-43](#).

Table 2-43 Basic settings

Parameter	Configuration
Migration Plan Name	User-defined
Description (Optional)	User-defined

Parameter	Configuration
Source Platform	Select the cloud platform where the source resources are located.
Target Region	Select the region where the target buckets are located.

Step 5 Above the source bucket list, click **Add**.

Step 6 Select the buckets to be migrated in a batch. For each of the selected buckets, click **Modify** in the **Operation** column to specify the migration method. For details about the migration methods, see [Table 2-44](#). Then click **Confirm**.

 **CAUTION**

- The selected resources must come from the source platform selected in **Basic Settings**.
- A maximum of 100 buckets can be added.

Table 2-44 Migration methods

Migration Method	Description
Full migration	Migrates all data in the source bucket or specified directories.
List migration	Migrates objects recorded in the list files. The list files must be stored in the target bucket.
Prefix migration	Migrates objects matched with the specified names or prefixes.

Step 7 In the list of buckets to be migrated, click **Modify** in the **Operation** column.

Step 8 Select the resource credential. It is best to enter the total number and size of objects to be migrated. Then click **Confirm**.

- If the migration method configured for the bucket is **List migration**, in the **List Path** box, enter the directory that stores the lists of objects to be migrated. The directory must end with a slash (/).
- If the migration method configured for the bucket is **Prefix migration**, add the names or prefixes of objects to be migrated. Note that you need to click **Save** each time you add an object name or prefix.

 **NOTE**

If the files to be migrated are stored in the root directory of the source bucket, add their name prefixes directly. If the files are stored in a non-root directory, add their directories and name prefixes in the format of *Directory/Prefix*.

Step 9 After you configure the migration settings for all buckets to be migrated, click **Next**.

- Step 10** For each source bucket, click **Modify** in the **Operation** column. Then select the credential used for accessing the target bucket, specify the target bucket, enter a prefix to rename or relocate migrated objects, and click **Save**.
- Step 11** After you configure the target bucket settings for all buckets to be migrated, click **Next**. You can assess how large of a migration cluster is required for the migration and then create a migration cluster with the recommended specifications. Alternatively, you can skip this step and use an existing migration cluster. For details about how to create a cluster, see [Creating a Migration Cluster](#).
- Step 12** Click **Next** to select an existing migration cluster. All resources in this plan will be migrated using this cluster.
- Step 13** Click **Select Cluster**. The **Select Cluster** dialog box is displayed on the right.
- Step 14** In the cluster list, select the cluster you want to use and click **Confirm**. If you want to modify an existing cluster to meet your requirements, see [Managing a Migration Cluster](#).
- Step 15** Click **OK**. After migration plan is created, you can see it in the list.
- If you need to modify the plan settings, click **Design** in the **Operation** column.
 - After **Completed** appears in the **Progress** column, click **Create Workflow** in the **Operation** column to [create a migration workflow](#) to migrate all buckets in the plan in a batch.

----End

2.8.3 Creating a Batch File Storage Migration Plan

Follow this section to configure a migration plan for batch migrating file systems.

The Batch Object Storage Migration template can be used to migrate multiple file systems in a batch. If only one file system needs to be migrated, [create a migration workflow](#) directly.

Preparations

- Creating a migration project
Create a migration project on the MgC console. For details, see [Managing Migration Projects](#).
- Creating a migration cluster
Create a dedicated migration cluster for this migration. A cluster consists of a master node and several list and migration nodes. For details about how to create a cluster, see [Creating a Migration Cluster](#).
- Creating target file systems
Create target file systems for receiving migrated source data. For details, see [Creating a General Purpose File System](#) or [Creating an SFS Turbo File System](#).

Notes

- Only one migration workflow can be created for a migration plan.

- A maximum of 100 file systems can be added to a migration plan.
- Target file systems included in a migration plan must be in the same region.

Procedure

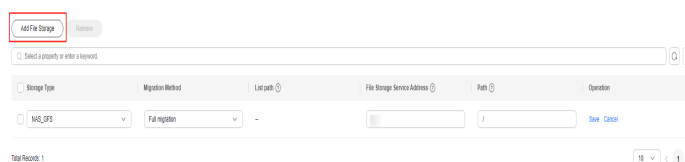
- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane, choose **Design > Migration Plans**.
- Step 3** Click **Create Migration Plan** in the upper right corner of the page.
- Step 4** In the **Batch File Storage Migration** card, click **Configure Migration Plan**.
- Step 5** In the **Basic Settings** area, set parameters listed in [Table 2-45](#).

Table 2-45 Basic settings

Parameter	Configuration
Migration Plan Name	User-defined
Description (Optional)	User-defined
Target Region	Select the region where the target file storages are located.

- Step 6** Click **Add**. A new row will be added below, allowing you to configure a source file system. Each click of this button will add another row, enabling you to include multiple source file systems in this plan.

Figure 2-32 Adding a source file system



- Step 7** Configure a source file system based on [Table 2-46](#).

Table 2-46 Parameters for configuring a source file system

Parameter	Description	Remarks
Storage Type	Supported source storage types include NAS_GFS, NAS_NFS_V3_PROTOCOL, and NAS_NFS_V3_MOUNT.	-

Parameter	Description	Remarks
Migration Method	Select a migration method. <ul style="list-style-type: none"> ● Full migration: This method is used to migrate all data in a specific path in the source file system. ● List migration: This method is used to migrate files and directories recorded in lists. 	-
List Path	If the list migration method is used, enter the path to the list files. If the full migration method is used, leave it blank.	A list file must meet the following requirements: <ul style="list-style-type: none"> ● A list file cannot exceed 30 MB. ● A list file must be a .txt file. ● A list file must be in UTF-8 without BOM. ● Each line in a list file can contain only one file or directory name, and the name must be URL encoded. ● Each line in a list file cannot exceed 16,384 (16 × 1,024) bytes, or the migration will fail. ● A list file can contain a maximum of 10,000 lines.



Parameter	Description	Remarks
File System Address	<p>Enter the mount address of the source file system.</p> <ul style="list-style-type: none"> If the storage type is NAS_GFS, the file system address can include a host name, domain name, (optional) subdomain, port, and path. If the storage type is NAS_NFS_V3_PROTOCOL or NAS_NFS_V3_MOUNT, the file system address must match any of the following formats: <ul style="list-style-type: none"> <code><IP-address>:/</code> <code><IP-address>:<path></code> <code><domain-name>:/</code> <code><domain-name>:<path></code> 	<p>For a full migration, the combination of a source file system address and the path to be migrated must be unique. For a list migration, the combination of a source file system address and the list path must be unique. In both cases, the prefix matching rule is applied.</p> <p>For example, if you have added the file system address 192.168.0.1:/a with a migration path /abc/a, an error will be reported if you add the file system address 192.168.0.1:/a with a migration path /abc. To overwrite an existing path, you need to delete the existing address and path combination first.</p>
Path	<p>Enter the directory where files and directories to be migrated are located. The format is <i>/ Folder name</i>.</p>	<p>If the list migration method is selected, enter / in the Path text box.</p>

Step 8 Each time after you configure a source file system, click **Save** in the **Operation** column. After all source file systems to be migrated are configured, click **Next**.

Step 9 In the list, click **Modify** in the **Operation** column to configure a target files system for each source file system.

Table 2-47 Parameters for configuring a target file system

Parameter	Description	Remarks
Source Path	This path is automatically generated by combining the source file system address with the path to be migrated.	-
Storage Type	Only NAS_NFS_V3_MOUNT is supported.	

Parameter	Description	Remarks
File System Address	<ul style="list-style-type: none"> If a General Purpose file system is used as the target, enter the mount address of the file system. To obtain the mount address, go to the file system list and click the  icon next to the address in the Mount Point column. If an SFS Turbo file system is used as the target, enter the shared path of the file system. To obtain the shared path, go to the SFS Turbo file system list, click  next to the path in Shared Path column. 	Combinations of target file system addresses and paths can be duplicated.
Path	Enter the directory for storing files and directories migrated. The format is <i>/Folder name</i> .	-

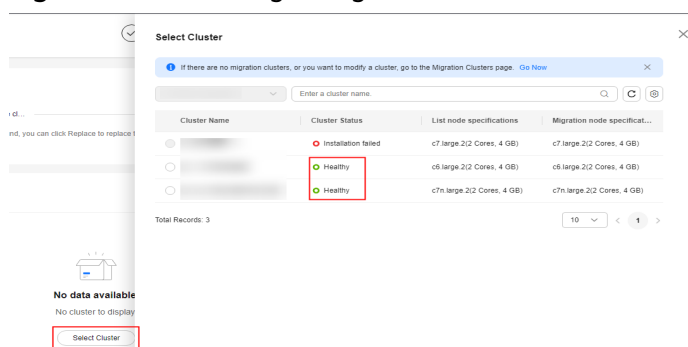
Step 10 Each time after you configure a target file system, click **Save** in the **Operation** column. After you configure a target file system for each source file system, click **Next**. You can assess how large of a migration cluster is required for the migration and then create a migration cluster with the recommended specifications. Alternatively, you can skip this step and use an existing migration cluster. For details about how to create a cluster, see [Creating a Migration Cluster](#).

Step 11 Click **Next** to select an existing migration cluster. All resources in this plan will be migrated using this cluster.

Step 12 Click **Select Cluster**. The **Select Cluster** page is displayed on the right.

Step 13 In the cluster list, select the cluster to be used and click **OK**. The cluster must be in a healthy state. If you want to modify an existing cluster to meet your requirements, see [Managing a Migration Cluster](#).

Figure 2-33 Selecting a migration cluster



Step 14 Click **OK**. After migration plan is created, you can see it in the list.

- If you need to modify the plan settings, click **Design** in the **Operation** column.
- After **Completed** appears in the **Progress** column, click **Create Workflow** in the **Operation** column to [create a migration workflow](#) to migrate all source file systems in the plan in a batch.

----End

2.9 Migration Clusters

2.9.1 Creating a Migration Cluster

You can create dedicated migration clusters to accelerate storage migration. A migration cluster consists of nodes that have the migration plugin installed and are used to execute migration and listing tasks.

Precautions

- A maximum of two migration clusters can be created in each region in an account.
- To ensure migration stability and data security, you are not allowed to log in to nodes in migration clusters. If you indeed need to log in to the nodes, contact technical support.
- If a migration cluster is idle for more than 30 days, its status will change to **Discarded**. The cluster will not be deleted but cannot be restored.
- You can see the details about resources contained in a migration cluster and the security group settings of all cluster nodes in [Migration Cluster Resources and Settings](#).

Billing

You are billed at standards rates for migration clusters and additional resources used during migrations.

- Master, migration, and list nodes in migration clusters are all ECSs, and you pay for these ECSs. For details, see [ECS Pay-per-Use Billing](#) or [ECS Price Calculator](#).
- If you migrate over the Internet, you need to pay for NAT gateways used by migration clusters. For details, see [NAT Gateway Billing](#) or [NAT Gateway Price Calculator](#).
- If you choose to enable log collection, you need to pay Log Tank Service (LTS) for resources you consume. For details, see [LTS Billing](#) or [LTS Price Calculator](#).

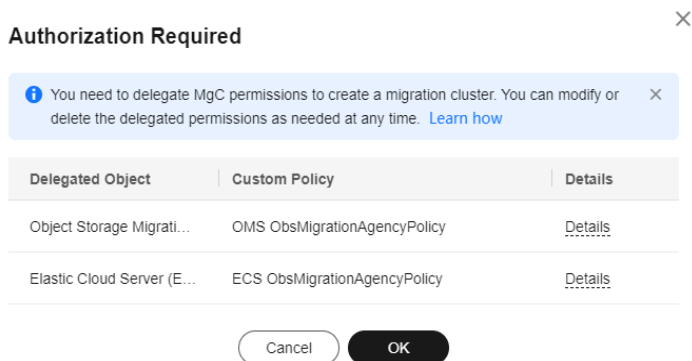
Procedure

Step 1 Sign in to the [MgC console](#).

Step 2 In the left navigation pane, choose **Deploy > Migration Clusters**.

Step 3 Click **Create Cluster** in the upper right corner of the page.

If this is your first time to create a migration cluster, you need to delegate MgC the required permissions. For more information about the required permissions, see [Agency Permissions](#).



Step 4 Configure the parameters listed in [Table 2-48](#).

Table 2-48 Parameters for creating a cluster

Area	Parameter	Configuration	Constraints
Basic Settings	Cluster Name	Enter a name.	The cluster name must be unique in the same account.
	Region	Select the region to provision the cluster.	The cluster must be provisioned in the target region you are migrating to.
	Cluster Type	Select what the cluster will be used for.	Currently, only storage migration is supported.
Node Settings	Master Node	It is used to manage migration nodes and list nodes.	A cluster can only have one master node.

Area	Parameter	Configuration	Constraints
	Migration Node	Migration nodes are used for executing migration and verification tasks. The recommended specifications are 8 vCPUs and 16 GB of memory.	<ul style="list-style-type: none"> • The node specifications cannot be modified after the cluster is created. • The number of nodes must meet the following requirements: <ul style="list-style-type: none"> - Number of migration nodes + Number of list nodes + 1 ≤ 100 - Number of migration nodes + Number of list nodes + 1 ≤ Number of unused IP addresses in the subnet
	List Node	List nodes are used for listing tasks. The recommended specifications are 8 vCPUs and 16 GB of memory.	
Network Settings	VPC	Select a VPC from the drop-down list.	-
	Subnet	Make sure that there are enough unused IP addresses for the migration and list nodes in this cluster.	Number of unused IP addresses in the subnet ≥ Number of migration nodes + Number of list nodes + 1

Area	Parameter	Configuration	Constraints
	Network Type	<ul style="list-style-type: none"> ● Internet: You need to select a public NAT gateway. If there is no gateway available, choose Buy Gateway from the drop-down list and select the gateway specifications and EIPs you want to associate with the gateway. A maximum of 20 EIPs can be selected at a time. ● Intranet: This option is suitable for data migration within a region. ● Private line: Source data is directly accessed through the private line. For details about Direct Connect, see Direct Connect. 	-
Advanced Settings	DNS Configuration (Optional)	Enter the IP address of the DNS server to update the value of nameserver in the /etc/resolv.conf file. Use commas (,) to separate multiple DNS server addresses, for example, 192.0.2.1,192.0.2.2.	A maximum of three DNS IP addresses can be specified.
	Domain Mapping (Optional)	Add mappings between domain names and IP addresses to update the /etc/hosts file.	A maximum of 500 mappings can be added.

Area	Parameter	Configuration	Constraints
-	Traffic Limiting	<p>Allocate the maximum bandwidth to be used by the workflow during a specified period.</p> <ul style="list-style-type: none"> If you do not select this option, migration traffic is not limited. If you select this option, limit the migration traffic by setting the start time, end time, and bandwidth limit. <p>NOTICE For example, if you set Start Time to 08:00, End Time to 12:00, and Maximum Bandwidth to 20 MB/s, the maximum migration speed is limited to 20 MB/s when the migration task is running in the period from 08:00 to 12:00. The migration speed is not limited beyond this period.</p>	<ul style="list-style-type: none"> A maximum of five traffic limiting rules can be added. The time is the local standard time of the region you are migrating to.
	Log Collection	<ul style="list-style-type: none"> If this option is enabled, logs generated during the migration are collected for possible troubleshooting later. If this option is disabled, logs generated during storage migrations are not collected. 	-

Step 5 Click **Confirm**. Then you can view the cluster in the list. For details about cluster statuses, see [Cluster Statuses](#). If the cluster status is **Creation failed**, move the cursor to the status to view the failure cause. After the fault is rectified, choose **More > Retry** to try to create the cluster again.

Step 6 After the migration cluster is created, perform the following operations:

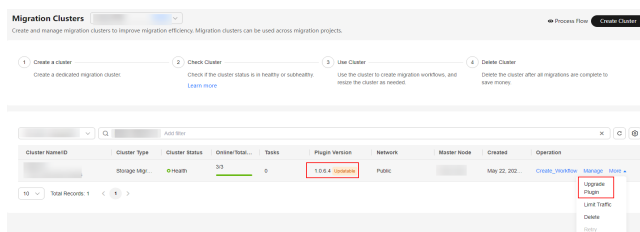
- If the cluster status is **Healthy** or **Subhealthy**, click **Create Workflow** in the **Operation** column to .

- Click **Manage** in the **Operation** column to add or delete nodes and traffic limiting rules for the cluster. For details, see [Managing a Migration Cluster](#).

----End

Upgrading Plug-ins

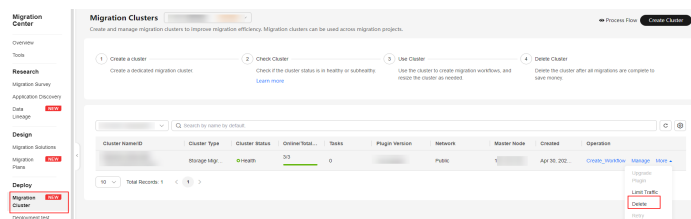
You can upgrade the migration plugin to the latest version for a cluster by choosing **More > Upgrade Plugin** in the **Operation** column.



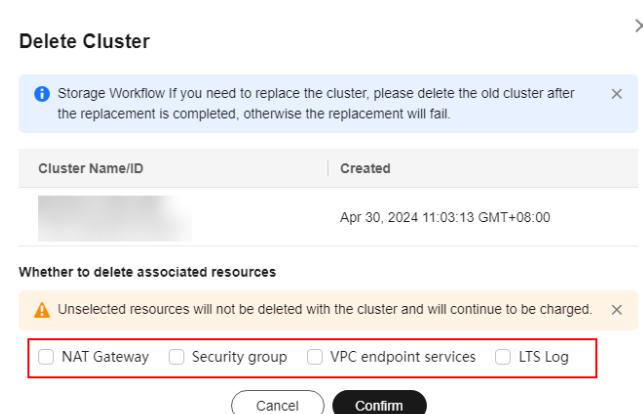
Deleting a Migration Cluster

If a migration cluster is no longer needed after your data migration is complete, you can delete the cluster and the associated resources.

- Step 1** In the cluster list, locate the cluster to be deleted and choose **More > Delete** in the **Operation** column.



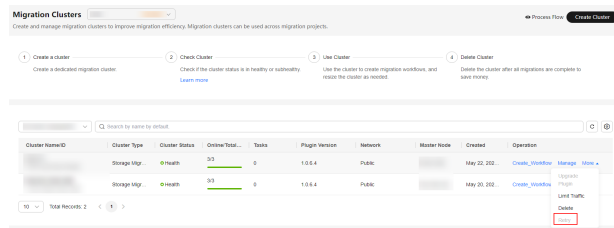
- Step 2** Select whether to delete associated resources and click **OK**.



----End

Retrying to Create a Migration Cluster

If a migration cluster fails to be created, after you rectify the fault, you can try to create the cluster again by choosing **More > Retry** in the **Operation** column.



2.9.2 Managing a Migration Cluster

For a migration cluster, you can configure traffic limiting rules and add or remove nodes as needed.

Prerequisites

You have [created a cluster](#).

Adding a Traffic Limiting Rule

- Step 1** Sign in to the **MgC** console. In the left navigation pane, choose **Deploy > Migration Clusters**.
- Step 2** In the cluster list, locate a migration cluster and click **Manage** in the **Operation** column.
- Step 3** In the **Traffic Limiting** area, click **Add** to add a rule.
- Step 4** Configure the start time, end time, and bandwidth limit.

For example, if you set **Start Time** to **08:00**, **End Time** to **12:00**, and **Maximum Bandwidth** to **20 MB/s**, the maximum migration speed is limited to 20 MB/s when the migration task is running in the period from 08:00 to 12:00. The migration speed is not limited beyond this period.

NOTICE

- The time is the local standard time of the region you are migrating to.
- A maximum of five rules can be added.

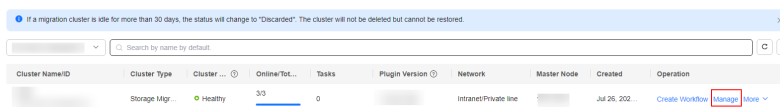
- Step 5** Click **Confirm**.

----End

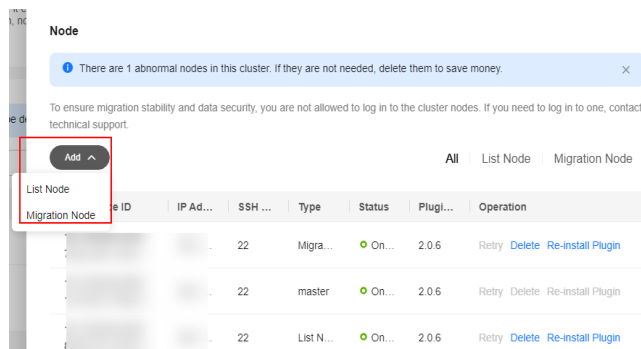
Adding Nodes

The procedure for adding a migration cluster node is the same as that for adding a list node.

- Step 1** Sign in to the **MgC** console. In the left navigation pane, choose **Deploy > Migration Clusters**.
- Step 2** In the cluster list, click **Manage** in the **Operation** column.

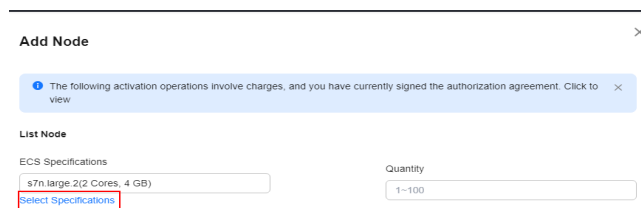


Step 3 In the node information area, choose **Add > Migration Node**.



Step 4 Select the node specifications and enter the number of nodes to be added. The number of nodes in the cluster must meet the following requirements:

- Number of migration nodes + Number of list nodes + 1 ≤ 100
- Number of migration nodes + Number of list nodes + 1 ≤ Number of unused IP addresses in the subnet



Step 5 Click **Confirm**. After the nodes are added, MgC starts to install the migration plugin on these nodes, and you can view the added nodes in the node list.

----End

2.9.3 Billing

You are billed at standards rates for migration clusters and additional resources used during migrations.

- Master, migration, and list nodes in migration clusters are all ECSs, and you pay for these ECSs. For details, see [ECS Pay-per-Use Billing](#) or [ECS Price Calculator](#).
- If you migrate over the Internet, you need to pay for NAT gateways used by migration clusters. For details, see [NAT Gateway Billing](#) or [NAT Gateway Price Calculator](#).
- If you choose to enable log collection, you need to pay Log Tank Service (LTS) for resources you consume. For details, see [LTS Billing Description](#) or [LTS Price Calculator](#).

2.9.4 Cluster Statuses

For details about cluster statuses, see [Table 2-49](#).

Table 2-49 Cluster statuses

Status	Description
Creating	Cluster resources are being created.
Creation failed	Cluster resources fail to be created.
Connecting	The master node is waiting for going online, and other nodes are waiting for creation.
Healthy	All nodes are online.
Subhealthy	At least one migration node and one list node are online.
Unavailable	All migration nodes or all list nodes are offline.
Offline	The master node is offline. The cause may be that the network is interrupted or the ECS is deleted. Check the VPCEP service and ECS resources.
Upgrading	Plugins are being upgraded in the cluster.
Upgrade failed	Plugins failed to be upgraded in the cluster.
Discarding	The cluster is being discarded because no tasks have run in the cluster within 30 days.
Discard failed	The cluster failed to be discarded.
Deleting	The cluster is being deleted.
Deletion failed	The cluster failed to be deleted.
Discarded	The cluster is discarded since its VPCEP resources are deleted.
Pending creation	Cluster resources are waiting for creation.
Installing	Plugins are being installed on the master node.
Installation failed	Plugins failed to be installed on the master node.
Pending installation	The master node is waiting for plugin installation.
Pending upgrade	The cluster is waiting for plugin upgrade.
Pending deletion	The cluster is waiting for deletion.

2.9.5 Migration Cluster Resources and Settings

This section describes the resources and their settings of a migration cluster.

Migration Cluster Resources

Resource	Configurable During Cluster Creation	Mandatory	Quantity	Naming Rule	Description
ECSs	Yes	Yes	<ul style="list-style-type: none"> Master node: 1 Migration nodes: created based on the settings specified during cluster creation List nodes: created based on the settings specified during cluster creation 	<i>oms_cluster_ecs_Node ID</i>	These ECSs have the migration plug-in installed and are used to schedule and perform migration tasks.
NAT gateway	Yes	No	1	<i>oms_cluster_nat_Cluster ID</i>	This NAT gateway enables list and migration nodes to communicate with migration sources over the public network, so that source data can be migrated.

Resource	Configurable During Cluster Creation	Mandatory	Quantity	Naming Rule	Description
LTS	Yes	No	1	Host group name: oms_lts_host_group_ <i>Cluster ID</i> Host group name: oms_lts_host_group_label_ <i>Cluster ID</i> Log group name: oms_lts_log_group_ <i>Cluster ID</i> Log stream name: oms_lts_stream_group_ <i>Cluster ID</i> Log access name: oms_lts_access_config_ <i>Cluster ID</i>	LTS is used to save and search for logs of the migration cluster. If Log Collection is not enabled during cluster creation, these LTS resources will not be created.

Resource	Configurable During Cluster Creation	Mandatory	Quantity	Naming Rule	Description
VPC endpoint service	No	Yes	1	<i>Region name.oms-cluster.Service ID</i>	<p>This VPC endpoint service allows OMS to communicate with the master node in the migration cluster to manage migration tasks.</p> <p>For details, see VPC Endpoint Service Configuration.</p>

Resource	Configurable During Cluster Creation	Mandatory	Quantity	Naming Rule	Description
Security groups	No	Yes	2	oms_cluster_sg_master _Cluster ID	<p>This is the security group of the master node in the migration cluster. It enables the communication between OMS and the migration cluster.</p> <p>For details about the security group settings, see Security Group Settings for the Master Node.</p>

Resource	Configurable During Cluster Creation	Mandatory	Quantity	Naming Rule	Description
				oms_cluster_sg_agent_ <i>Cluster ID</i>	<p>This is the security group of the list and migration nodes in the migration cluster. It enables communication between nodes in the migration cluster.</p> <p>For details about the security group settings, see Security Group Settings for List and Migration Nodes.</p>

VPC Endpoint Service Configuration

Item	Configuration	Description
VPC	The VPC where the migration cluster works is selected.	-
Service Type	Interface	-
Connection Approval	This option is enabled.	VPC endpoints need to be approved before they can connect to this endpoint service.
Port Mapping	Ports 22 and 9002 are mapped.	They are used for plugin installation, task delivery, and task management.
Backend Resource Type	ECS	The ECS used as the master node.
Connection Management	The VPC endpoint of OMS is allowed to access this VPC endpoint service.	Allows OMS to communicate with the master node in the migration cluster.
Permission Management	OMS is added to the whitelist.	Allows access from the VPC endpoint of OMS.

Security Group Settings for the Master Node

Direction	Priority	Action	Type	Protocol & Port	Source or Destination	Description
Inbound	1	Allow	IPv4	All	Security group of the master node	Allows VMs in the security group to communicate with each other.
Inbound	1	Allow	IPv6	All	Security group of the master node	Allows VMs in the security group to communicate with each other.
Inbound	1	Allow	IPv4	TCP: 22	198.19.128.0/17	Allows OMS to communicate with the master node to install the migration plugin.

Direction	Priority	Action	Type	Protocol & Port	Source or Destination	Description
Inbound	1	Allow	IPv4	TCP: 9002	198.19.128.0/17	Allows OMS to communicate with the master node to deliver and manage tasks.
Inbound	1	Allow	IPv6	All	The security group of the list and migration nodes	Allows the list and migration nodes to communicate with the master node.
Inbound	1	Allow	IPv4	All	The security group of the list and migration nodes	Allows the list and migration nodes to communicate with the master node.
Outbound	1	Allow	IPv6	All	::/128	Allows outbound traffic to communicate with the migration source.
Outbound	1	Allow	IPv4	All	0.0.0.0/0	Allows outbound traffic to communicate with the migration source.
Outbound	1	Allow	IPv6	All	The security group of the list and migration nodes	Allows the list and migration nodes to communicate with the master node.
Outbound	1	Allow	IPv4	All	The security group of the list and migration nodes	Allows the list and migration nodes to communicate with the master node.

Security Group Settings for List and Migration Nodes

Direction	Priority	Action	Type	Protocol & Port	Source or Destination	Description
Inbound	1	Allow	IPv6	All	Security group of the mater node	Allows the list and migration nodes to communicate with the master node.
Inbound	1	Allow	IPv4	All	Security group of the mater node	Allows the list and migration nodes to communicate with the master node.
Inbound	1	Allow	IPv4	All	The security group of the list and migration nodes	Allows VMs in the security group to communicate with each other.
Inbound	1	Allow	IPv6	All	The security group of the list and migration nodes	Allows VMs in the security group to communicate with each other.
Outbound	1	Allow	IPv4	All	0.0.0.0/0	Allows outbound traffic to communicate with the migration source.
Outbound	1	Allow	IPv6	All	::/128	Allows outbound traffic to communicate with the migration source.
Outbound	1	Allow	IPv6	All	Security group of the mater node	Allows the list and migration nodes to communicate with the master node.
Outbound	1	Allow	IPv4	All	Security group of the mater node	Allows the list and migration nodes to communicate with the master node.

2.10 Migration Workflows

2.10.1 Workflow Quotas

To ensure smooth migrations, MgC has the following limits on migration workflows.

- A maximum of 50 migration workflows can be created per day in a project.
- A maximum of 1,000 servers can be concurrently. For any servers beyond this number, the workflows will pause at the first step and put these servers in a pending state until other servers complete their migration. The workflows will then automatically start on these servers in the order the workflows were created.
- A maximum of 100 resources can be included in a workflow.

2.10.2 Creating a Server Migration Workflow

This section describes how to create a server migration workflow using the standard template.

Constraints

- A workflow can contain a maximum of 100 servers.
- You can migrate a maximum of 1,000 servers concurrently. For any servers beyond this number, the workflows will pause at the first step and put these servers in a pending state until other servers complete their migration. The workflows will then automatically start on these servers in the order the workflows were created.
- If this is your first time to create a server migration workflow, you need to delegate MgC the required permissions. For more information about the required permissions, see [Agency Permissions](#).

Notes

Before creating a server migration workflow, read and understand the following precautions.

Item	Precaution
Source download bandwidth	Used to download the migration Agent to source servers. <ul style="list-style-type: none">• If each source server uses a dedicated bandwidth, the bandwidth must be at least 30 Mbit/s.• If source servers share a bandwidth, the average bandwidth must be at least 50 Mbit/s.
Migration bandwidth	<ul style="list-style-type: none">• Used to migrate data. It affects the migration speed and duration.• For details about how to estimate the migration duration, see How Long Does a Migration Take?

Item	Precaution
CPU and memory	<ul style="list-style-type: none">At least 520 MB of available memoryAt least 0.3 CPUs available in Linux and at least 1 CPU available in Windows
OS compatibility	For details about what OSs are supported, see Supported OSs .
Server migration statements	For details about the important statements you need to understand before the migration, see What Are the Important Statements of SMS?
Notes and constraints	For details about the notes and constraints for server migration, see Notes and Constraints .
Billing	For details about the fees that may be incurred during the migration, see Billing .
Permissions configuration	For details about the permissions the target account must have, see Permissions Management .
Migration network and ports	For details about the requirements for the migration network and ports, see How Do I Set Up a Secure Migration Network for Using SMS?

Prerequisites

- You have [discovered source servers](#).
- Servers to be migrated have been added to an application, and the application servers have been assessed. For details, see [Grouping Resources as Applications](#) and [Getting Target Recommendations](#). After the assessment is complete, you can purchase recommended target servers in batches. For details, see [Purchasing Resources](#). Source servers with target servers associated do not need to be assessed. For details, see [Associating Source Servers with Target Servers](#).

Procedure

- Step 1** Sign in to the [MgC](#) console.
- Step 2** In the navigation pane on the left, choose **Migrate > Workflows**. Select a [migration project](#) in the upper left corner of the page.
- Step 3** Click **Create Workflow** in the upper right corner of the page.
- Step 4** In the **Server Migration** card, click **Preview Steps** to view the steps predefined in the template and the detailed description of each step. If the type of a step is **Automated**, the step is automatically performed by MgC. If the type of a step is **Manual**, you need to perform the step manually. Click **Next: Configure Workflow** in the lower right corner.
- Step 5** Configure the workflow parameters based on [Table 2-50](#).

Table 2-50 Parameters for configuring a server migration workflow

Area	Parameter	Description
Workflow Details	Name	User-defined
	Description	
	Select Source Resources	<ul style="list-style-type: none"> • By application: Servers in the selected application will be migrated together. • By migration plan: Servers in the selected migration plan will be migrated together.
Application	Application	If Select Source Resources is set to By application , select the application that contains the servers to be migrated.
Migration Plan	Migration Plan	If Select Source Resources is set to By migration plan , select the plan that contains the servers to be migrated. For details about how to create a migration plan, see Creating a Server Migration Plan .
Migration Network	Network Type	If you select Public , ensure that all target servers have EIPs bound. These EIPs will be used for the migration.
		<p>If you select Private, configure Direct Connect connections, VPN connections, VPC peering connections, or subnets in the target VPC in advance to ensure that the source environment can access the target environment.</p> <ul style="list-style-type: none"> • If the source environment cannot access the Internet, you need to enter the private IP address of the source proxy server and the port used by the proxy software. • If the source proxy server cannot access the Internet, put the SMS-Agent installation package at a location where the source servers can access directly or over a proxy. You can download the SMS-Agent installation package from the SMS console.
Target Environment	Region	The target region. It defaults to the one you selected when you assessed the application.
	Project	A project in the target region.

Area	Parameter	Description
	VPC	<ul style="list-style-type: none"> • If the source IP address is 192.168.X.X, you are advised to create a VPC and a subnet that both belong to network range 192.168.0.0/16. • If the source IP address is 172.16.X.X, you are advised to create a VPC and a subnet that both belong to network range 172.16.0.0/12. • If the source IP address is 10.X.X, you are advised to create a VPC and a subnet that both belong to network range 10.0.0.0/8.
	Subnet	The subnet has to be in the same network segment as the VPC.
	Security Group	<ul style="list-style-type: none"> • If there are Windows source servers, the security group must allow access on ports 8899, 8900, and 22. • If there are Linux source servers, the security group must allow access on port 22. <p>CAUTION</p> <ul style="list-style-type: none"> - For security purposes, you are advised to only allow traffic from the source servers on these ports. - The firewall of the target servers must allow traffic to these ports.
	Enable Disk Encryption	If you select No , the system and data disks will not be encrypted for target server newly created in the workflow.

Area	Parameter	Description
		<p>If you select Yes, the system and data disks will be encrypted for target servers newly created by the workflow.</p> <p>To enable disk encryption, you need to create an agency to authorize EVS to access KMS. If you have the right to grant the permissions, grant the KMS access permissions to EVS directly. After the authorization succeeds, you do not need to perform the authorization again. If you do not have the right to grant the permissions, contact a user with the Security Administrator permissions to grant you the right and then repeat the preceding operations. After the authorization is successful, configure the following parameters:</p> <ul style="list-style-type: none"> • Select an existing key Select a key from the drop-down list. You can select one of the following keys: Default keys: After the KMS access permissions have been granted to EVS, the system automatically creates a default key and names it evs/default. Custom keys: You can choose an existing key or create a new one. For details about how to create a key, see Creating a Key. • Enter a key ID Enter the ID of a key shared from another user. Ensure that the key is in the target region. For details, see Creating a Grant. <p>NOTICE</p> <ul style="list-style-type: none"> • This setting does not apply to existing target servers associated with the source servers. • This setting applies to all target servers newly created by the workflow. The disks on these new target servers will be encrypted using the same key. • The encryption attribute of a disk cannot be modified after the disk is created. • Keys can be shared with accounts, not users.
Advanced Settings	Start Target After Migration	<ul style="list-style-type: none"> • If you select No, the target servers will be stopped after the migration is complete. • If you select Yes, the target servers will be started after the migration is complete.

Area	Parameter	Description
	Set Bandwidth Limit	<ul style="list-style-type: none">If you select No, the migration traffic is not limited.If you select Yes, you can limit the bandwidth that can be used for migration based on the source bandwidth and service requirements. CAUTION Consider the migration scale to set an appropriate bandwidth limit. If the bandwidth allocated to the workflow is too small, migration tasks in the workflow may preempt the limited bandwidth resource, and some servers may fail to be migrated.
	Install rsync on Source	<ul style="list-style-type: none">If you select No, the rsync component will not be installed on the source servers.If you select Yes, the rsync component will be automatically installed on the source servers. CAUTION Linux migrations depend on rsync. If rsync is not installed on a source server, the server will fail to be migrated.
	Retain IP Address	Enable this option to retain the private IP addresses of the source servers on the target servers. Enabling it may cause risks. You need to evaluate and take responsibility for any potential risks.
	Enable Quick Mode	Enable this option if incremental synchronization is not required. This option is disabled by default. If it is enabled, incremental synchronization is skipped and then subsequent steps are performed after full replication is complete in the workflow. Set this option based on your requirements.
	Enterprise Project	Select the enterprise project you want to migrate to. The enterprise project default is selected by default.

Step 6 Click **Next: Confirm**.

Step 7 Confirm the workflow settings, and click **Confirm**. The **Run Workflow** dialog box is displayed, which indicates that the workflow has been created.

- If you want to start the migration immediately, click **Confirm** to run the workflow.
- If you want to [add a stage or step](#) to the workflow, click **Cancel**. The workflow enters a **Waiting** state, and the migration is not started. To start the migration, click **Run** in the **Operation** column.

- Step 8** On the migration workflow details page, view the workflow settings and the migration progress. After the step for starting the migration Agent is completed, a migration task is automatically created on the SMS console. For details about the server information mapping between MgC and SMS, see [What Are the Information Mappings Between MgC and SMS?](#)
- Move the cursor to the migration progress bar. In the box that is displayed, view more migration details.
 - When the migration progress bar reaches a step that requires manual confirmation, move the cursor to the progress bar and click **Confirm** next to the step status in the displayed window, so that the subsequent migration steps can be executed.
 - When the workflow reaches the **ResizeDiskPartition** step, the system identifies whether disk capacity reduction has been performed on the target server.
 - If yes, go to [SMS console](#) and resize disks and partitions for the target server. For details, see the **Partition Resizing** parameter in [Configuring a Target Server](#). After the adjustment is complete, go back to the MgC console and click **Confirm** next to the step status so that the workflow can continue.
 - If no, skip this step.
 - The **StartSynchronization** step is repeated before you verify your services on the target server.
 - When the progress bar reaches **Cutover**, the migration is complete. You need check whether your service systems are running properly on the target server. If they are, manually switch services to the target server. After the switchover is complete, click **Confirm** in the workflow. The system automatically performs the following steps **SourceClear** and **MigrationTaskClear**.

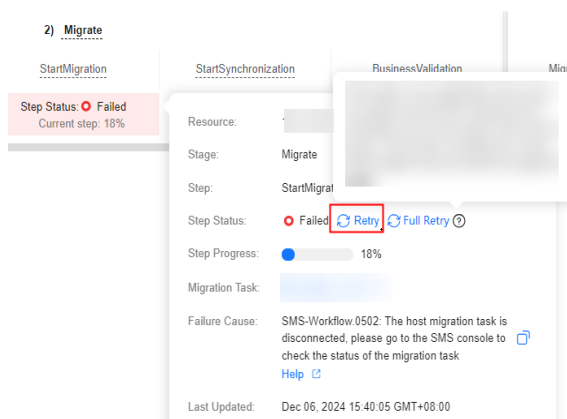
----End

When to Use the Retry and Full Retry Buttons

During the running of the server migration workflow, Edge launches an SMS-Agent migration process on each source server. After the process is started, it communicates with the SMS console and receives commands to perform migration. During the **StartMigration** and **StartSynchronization** steps in the workflow, if the SMS-Agent process on a source server disconnects from the SMS console, the MgC console will detect the disconnection, causing the migration workflow to fail on that source server. On the migration workflow details page, you will see options **Retry** and **Full Retry**. The appropriate choice depends on the cause of the disconnection. The possible causes for the disconnection include:

- **Possible cause 1:** There is a network exception.
In this case, the SMS-Agent process still opens on the source server. You only need to restore the network, wait until the connection to the SMS console is restored, and click **Retry** to resume the migration.

Figure 2-34 Retry



Command for checking the SMS-Agent process on Linux:

```
# ps -ef | grep -v grep | grep linuxmain
```

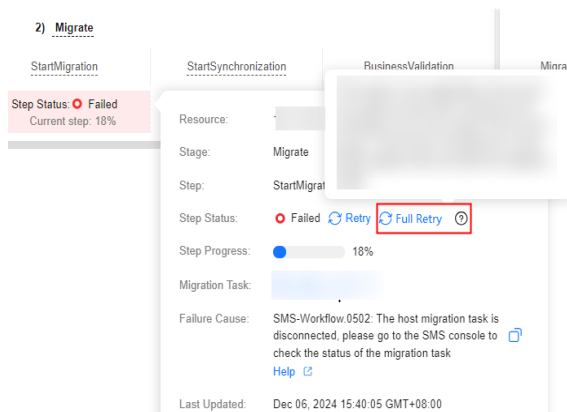
Command for checking the SMS-Agent process on Windows:

```
# Get-Process -Name SMSAgentDeploy -ErrorAction SilentlyContinue
```

- **Possible cause 2:** The SMS-Agent process is stopped due to a restart of the source server.

In this case, the SMS-Agent process is stopped, and the migration cannot be resumed. You need to create an SMS migration task again by clicking the **Full Retry** button. After the migration task is cleared, the workflow starts from the **StartUpAgent** step to restart the SMS-Agent process on the source server and create an SMS migration task again.

Figure 2-35 Full Retry



CAUTION

Clicking the **Full Retry** button will delete the original migration task and create a new one. The migrated data will be overwritten.

2.10.3 Creating a Cross-AZ Migration Workflow

This section describes how to create a cross-AZ migration workflow using the standard template.

Prerequisites

- You have discovered servers by referring to [Simple Project](#).
- Servers to be migrated have been added to an application, and the application servers have been assessed or associated with existing target servers. For details, see [Grouping Resources as Applications](#) and [Getting Target Recommendations](#).

Procedure

- Step 1** Sign in to the [MgC](#) console.
- Step 2** In the navigation pane on the left, choose **Migrate > Workflows**. Select a [migration project](#) in the upper left corner of the page.
- Step 3** Click **Create Workflow** in the upper right corner of the page.
- Step 4** In the **Cross-AZ Migration** card, click **Preview Steps** to view the steps predefined in the template and the detailed description of each step. If the type of a step is **Automated**, the step is automatically performed by MgC. If the type of a step is **Manual**, you need to perform the step manually. Click **Configure Workflow** in the lower right corner.
- Step 5** Configure the workflow parameters listed in [Table 2-51](#).

Table 2-51 Parameters required for creating a cross-AZ migration workflow

Region	Parameter	Description
Workflow Details	Name	Enter a workflow name.
	Description	Describe the workflow.
Application	Application	Select the application which contains the servers to be migrated.
Migration Settings	Target Region	Select the region where the source AZ is located. The region configured in the application is populated by default.
	Target AZ	Select the AZ you want to migrate to. The configuration must be the same as that of the created application.
	Target Network	Only Retain original is available.

Region	Parameter	Description
	Target Server	Create now. MgC creates backups and images for source servers, and uses the images to create target servers immediately after the workflow runs.
	Stop Target Server	<ul style="list-style-type: none"> If you select Yes, target servers will be stopped after being created. If you select No, target servers will be started after being created.
	Stop Source Server	<ul style="list-style-type: none"> If you select Yes, source servers will be stopped before incremental backups are created for them. This ensures data consistency as high as possible. If you select No, source servers remain running when incremental backups are created for them.
	Create System Disk Image	<ul style="list-style-type: none"> If you select Yes, a system disk image will be created for each of the source servers. The images can be used to reinstall the OS for the paired target servers. If you select No, the system will not create system disk images for the source servers.
Advanced Settings	Delete Intermediate Resources	If this function is enabled, intermediate resources generated during the migration, such as backups, snapshots, and images, will be deleted after the service cutover is complete.
	Retain Primary NIC IP Addresses	If this function is enabled, the private and public IP addresses of the primary NIC on source servers will be retained on target servers, and random private IP addresses will be allocated to source servers. If a rollback is needed, it has to be performed manually.

Step 6 Click **Next: Confirm**.

Step 7 Confirm the workflow settings, and click **Confirm**. The **Run Workflow** dialog box is displayed, which indicates that the workflow has been created.

- If you want to start the migration immediately, click **Confirm** to run the workflow.
- If you want to [add a stage or step](#) to the workflow, click **Cancel**. The workflow enters a **Waiting** state, and the migration is not started. To start the migration, click **Run** in the **Operation** column.

Step 8 On the migration workflow details page, view the workflow settings and the migration progress.

- Move the cursor to the migration progress bar. In the box that is displayed, view more migration details.
- When the migration progress bar reaches a step that requires manual confirmation, move the cursor to the progress bar and click **Confirm** next to the step status in the displayed window, so that the subsequent migration steps can be executed.

----End

2.10.4 Creating a Storage Migration Workflow

This section describes how to create a storage migration workflow from the predefined template.

The following regions are supported:

- LA-Santiago
- LA-Sao Paulo
- TR-Istanbul
- AP-Bangkok
- AP-Singapore
- AP-Jakarta
- ME-Riyadh
- CN North-Beijing4
- CN East-Shanghai1

Notes and Constraints

- For more information, see [What Are the Restrictions on Using MgC for Storage Migration?](#)
- Data in the Deep Cold Archive storage of Alibaba Cloud OSS cannot be restored using the restoration function of MgC. You need to manually restore the data before migration.

Warnings

When you create a workflow, there are three options for **Overwrite Existing**: **Never**, **Always**, and **If older or different size**. If you choose **Never**, restarting the migration task after interruptions or pauses may cause incomplete data migration, but the task may still be displayed as successful, which affects data integrity. Use the **Never** option with caution.

Prerequisites

- You have created an [OBS bucket](#) or [SFS file system](#) on Huawei Cloud.
- You have [created a migration cluster](#).

Procedure

Step 1 Sign in to the [MgC](#) console.

- Step 2** In the navigation pane on the left, choose **Migrate > Workflows**. Select a **migration project** in the upper left corner of the page.
- Step 3** Click **Create Workflow** in the upper right corner of the page.
- Step 4** In the **Storage Migration** card, click **Preview Steps** to view the stages and steps predefined in the template and the detailed description of each stage and step. Steps of the **Automated** type will be automatically performed by MgC. Click **Configure Workflow** in the lower right corner.
- Step 5** Set workflow basics based on [Table 2-52](#).

Table 2-52 Basic parameters

Parameter	Description
Name	Enter a workflow name.
Region	Select a region you are migrating to.
Description	Enter a description.
Cluster	Select a migration cluster. The cluster consists of a master node and several migration and list nodes. If no cluster is available, create a cluster . NOTICE A master node is created by the system in a migration cluster by default. You do not need to configure it.

- Step 6** Configure the migration source and target based on [Table 2-53](#) and [Table 2-54](#).

Table 2-53 Parameters for configuring a migration source

Parameter	Description	Remarks
Location Type	The supported migration sources include: <ul style="list-style-type: none"> ● Huawei Cloud OBS ● Alibaba Cloud OSS ● Baidu Cloud BOS ● Tencent Cloud COS ● Kingsoft Cloud KS3 ● Qiniu Cloud KODO ● UCloud US3 ● Amazon S3 ● Azure Blob Storage ● NAS_GFS ● NAS_SMB ● NAS_NFS_V3_MOUNT ● NAS_NFS_V3_PROTOCOL ● HTTP/HTTPS data source 	-


Parameter	Description	Remarks
AK	Enter the AK of the source cloud account.	These parameters are available when cloud storage is selected for Location Type .
SK	Enter the SK of the source cloud account.	
Bucket	Enter the name of the source bucket to be migrated.	
Endpoint	Enter the endpoint of the region where the source bucket is located. For example, if Location Type is set to Alibaba Cloud OSS and the source bucket is located in CN East 1 (Hangzhou) , enter oss-cn-hangzhou.aliyuncs.com .	
Type	Set this parameter based on the source bucket type. You can view the bucket type in the basic information .	This parameter is available when Huawei Cloud OBS is selected for Location Type .
APPID	Enter the APPID of your Tencent Cloud account. NOTE You can view the APPID on the account information page of the Tencent Cloud console.	This parameter is available when Tencent Cloud COS is selected for Location Type .
Authentication Type	The following authentication types are supported: <ul style="list-style-type: none"> • Connection string • Storage account name and key For details about how to obtain the credentials, see How Do I Obtain Credentials for Accessing Microsoft Azure?	This parameter is available when Azure Blob Storage is selected for Location Type .

Parameter	Description	Remarks
List Path	<p>Enter the path where the lists of files to be migrated are stored. These lists must be stored in the same region as the target bucket.</p> <p>You need to write the URLs of files to be migrated and their new names at the target into the lists. Each line in the list can contain only one URL and one file name.</p> <p>Restrictions on list files are:</p> <ul style="list-style-type: none"> • The files must be in .txt format, and their metadata Content-Type must be text/plain. • A single file can contain a maximum of 100,000 rows. • A single file cannot exceed 300 MB. • A maximum of 10,000 list files can be stored in the folder. • The files must be in UTF-8 without BOM. • The length of each line in a file cannot exceed 65,535 characters, or the migration will fail. • The Content-Encoding metadata of the files must be left empty, or the migration will fail. • In the files, a tab character (\t) must be used to separate the URL and new file name in each line. The format is [URL] [Tab character][New file name]. Only the Chinese and special characters in the names must be URL encoded. • Spaces are not allowed in each line in a file. Spaces may cause migration failures because they may be mistakenly identified as object names. 	<p>These parameters are available when HTTP/HTTPS data source is selected for Location Type.</p>
File System Address	<p>Enter the mount address of the source file system. The format is <i>IP address:/</i> or <i>IP address:/xxx</i>, for example, 192.1.1.1:/0001.</p>	<p>These parameters are available when Location Type is set to NAS_SMB, NAS_NFS_V3_MOUNT, or NAS_NFS_V3_PROTOCOL.</p>
Path	<p>Enter the directory where files to be migrated are located. The format is <i>/Folder name</i>.</p>	

Parameter	Description	Remarks
Username	Enter the username of the account that can access all files in the source file system, for example, administrator .	These parameters are available when Location Type is set to NAS_SMB .
Password	Enter the password of the account.	
Domain on Windows	Enter the domain of the source node. NOTE You only need to enter the content before .com. For example, if the domain is test.com, enter test.	

Table 2-54 Parameters for configuring a migration target

Parameter	Description	Remarks
Location Type	Select Huawei Cloud storage based on the source storage type.	-
AK	Enter the AK of the Huawei Cloud account you are migrating to.	These parameters are available when Location Type is set to Huawei Cloud OBS .
SK	Enter the SK of the Huawei Cloud account you are migrating to.	
Bucket	Select the OBS bucket you are migrating your data to.	
Endpoint	Enter the endpoint of the region where the target OBS bucket is located. For example, if the target bucket is located in the CN North-Beijing4 region of Huawei Cloud, enter obs.cn-north-4.myhuaweicloud.com . NOTE If the migration source is an OBS bucket, you can view the endpoint in the OBS bucket overview.	
Specify Prefix	Specify a prefix to rename or relocate objects migrated to the target bucket. For example, if you specify the prefix /D , source file /A/B/C.txt will be relocated to /D/A/B/C.txt after being migrated to the target bucket. For details, see: Adding a Name Prefix or Path Prefix to Migrated Objects	

Parameter	Description	Remarks
File System Address	Enter the mount address of the target file system. To obtain the mount address, go to the SFS file system list and click the  icon next to the address in the Mount Point column.	These parameters are available when Location Type is set to NAS_SMB or NAS_NFS_V3_MOUNT .
Path	Enter the directory for storing files migrated. The format is <i>/Folder name</i> .	
Username	Enter the username of the account that can access all files in the target file system, for example, administrator .	These parameters are available when Location Type is set to NAS_SMB .
Password	Enter the password of the account.	
Domain on Windows	Enter the domain of the target node. NOTE You only need to enter the content before .com. For example, if the domain is test.com, enter test.	

Step 7 Configure the migration task based on [Table 2-55](#).

Table 2-55 Parameters for configuring a migration task

Parameter	Value	Description
Task Type	Full migration	Migrates all data in the source bucket or specified paths.

Parameter	Value	Description
	List migration	<p>Migrates files recorded in the list files.</p> <p>In List Path box, enter the path of the object lists stored in the target bucket. Restrictions on an object list file vary with the target location.</p> <ul style="list-style-type: none"> ● Target location: Huawei Cloud OBS <ul style="list-style-type: none"> - An object list file cannot exceed 30 MB. - An object list file must be a .txt file, and the Content-Type metadata must be text/plain. - An object list file must be in UTF-8 without BOM. - Each line in an object list file can contain only one object name, and the object name must be URL encoded. - Each line in an object list file cannot exceed 16 KB, or the migration will fail. - The Content-Encoding metadata of an object list file must be left empty, or the migration will fail. - An object list file can contain a maximum of 10,000 lines. ● Target location: NAS <ul style="list-style-type: none"> - An object list file cannot exceed 30 MB. - An object list file must be a .txt file. - An object list file must be in UTF-8 without BOM. - Each line in an object list file can contain only one object name, and the object name must be URL encoded. - Each line in an object list file cannot exceed 16 KB, or the migration will fail. - An object list file can contain a maximum of 10,000 lines.
	Prefix migration	<p>This option is only available for migration from cloud storage.</p> <p>If you enter a file name or name prefix in the Prefix box, only the objects that exactly match the specified name or prefix are migrated.</p> <p>NOTICE</p> <ul style="list-style-type: none"> ● If the files to be migrated are stored in the root directory of the source bucket, add their name prefixes directly. If the files are stored in a non-root directory, add their directories and name prefixes in the format of <i>Directory/Prefix</i>. ● Use commas (,) to separate multiple prefixes.

Parameter	Value	Description
Concurrent Subtasks	-	Specify the maximum number of concurrent subtasks. There cannot be more than 10 concurrent subtasks for each online migration node. For example, if there are 2 online migration nodes, the maximum number of subtasks can be 20 or any number below.
Overwrite Existing	Never	Files existing at the target will never be overwritten. WARNING <ul style="list-style-type: none"> If you choose Never for the initial migration, the attributes of involved parent folders at the source will not be migrated to the target. As a result, the folder attributes may be incomplete at the target. To avoid this issue, use the Never option with caution for the initial migration. If a migration task is paused or interrupted and then restarted or resumed, the Never option will cause the system to skip files that were not completely migrated earlier, but the task may still be marked as successful. This affects data integrity. To avoid this issue, use the Never option with caution.
	Always	Files existing at the migration target will always be overwritten.
	If older or different size	<ul style="list-style-type: none"> Files that already exist at the target will be overwritten if they are older than or have different sizes from the paired files at the source. Verification will be performed for folders after their contents are migrated. Folders that already exist at the target will be overwritten if they have different last modification times, sizes, or permissions from the paired folders at the source. NOTE For empty folders, the overwrite policy is the same as that for files.
Migrate Metadata	-	Decide whether to migrate metadata. <ul style="list-style-type: none"> If you select this option, object metadata will be migrated. If you do not select this option, only the Content-Type and Content-Encoding metadata will be migrated.
Clear Cluster	-	Determine whether to clear the migration cluster after the migration is complete. <ul style="list-style-type: none"> If you select this option, a step for clearing the migration cluster will be created in the workflow. You can also choose whether to clear resources used by the cluster, such as NAT gateways, security groups, and VPCEP resources. If you do not select this option, a step for clearing the migration cluster will not be created in the workflow.

Step 8 (Optional) Configure advanced options based on [Table 2-56](#).**Table 2-56** Advanced options

Parameter	Description	Remarks
Target Storage Class	Choose the storage class that your data will be migrated to in the target bucket. For details about storage classes, see Introduction to Storage Classes .	-
Enable KMS Encryption	<ul style="list-style-type: none">If you do not select this option, whether migrated data will be encrypted in the target bucket depends on the server-side encryption setting of the bucket.If you select this option, all migrated objects will be encrypted before they are stored in the target bucket. NOTE <ul style="list-style-type: none">Using KMS to encrypt migrated data may slow down the migration speed by about 10%.This option is only available when KMS is supported in the region you are migrating to.	This parameter is only available for migrations to Huawei Cloud OBS.
Restore Archive Data	<ul style="list-style-type: none">If you do not select this option, the system directly records archive objects in the list of objects that failed to be migrated and continues to migrate other objects in the migration task.If you select this option, the system automatically restores and migrates archive objects in the migration task. If an archive object fails to be restored, the system skips it and records it in the list of objects that failed to be migrated and continues to migrate other objects in the migration task. NOTE <p>The system will restore archive data before migrating it, and you pay the source cloud platform for the API requests and storage space generated accordingly.</p>	-
Filter Source Data	Filter files to be migrated by applying filters. For details about the filters, see Source Data Filters .	

Parameter	Description	Remarks
Download Data from CDN	<p>If the default domain name cannot meet your migration requirements, then as long as the source cloud service provider supports custom domain names, you can bind a custom domain name to the source bucket, and enable the CDN service on the source platform to reduce data download expenses. Enter a custom domain name in the Domain Name text box and select a transmission protocol. HTTPS is more secure than HTTP and is recommended.</p> <p>If the migration source is the Alibaba Cloud OSS or Tencent Cloud COS, you also need to select an authentication type and enter an authentication key.</p>	
Send SMN Notification	<p>Determine whether to use SMN to get notifications about migration results.</p> <ul style="list-style-type: none"> • If you do not select this option, no SMN messages are sent after the migration. • If you select this option, after the migration, SMN messages are sent to the subscribers of the selected topic. You can select the language and trigger conditions for sending messages. 	
Limit Traffic	<p>Allocate the maximum bandwidth to be used by the workflow during a specified period.</p> <ul style="list-style-type: none"> • If you do not select this option, migration traffic is not limited. • If you select this option, limit the migration traffic by setting Start Time, End Time, and Bandwidth Limit. <p>For example, if you set Start Time to 08:00, End Time to 12:00, and Bandwidth Limit to 20 MB/s, the maximum migration speed is limited to 20 MB/s when the migration task runs from 08:00 to 12:00. The migration speed is not limited beyond this period.</p> <p>NOTE</p> <ul style="list-style-type: none"> - The rate limit ranges from 0 MB/s to 1,048,576 MB/s. - A maximum of five rules can be added. - The time is the local standard time of the region you are migrating to. 	-

Parameter	Description	Remarks
Schedule Migration	<p>Schedule the migration to automatically run during a period.</p> <ul style="list-style-type: none"> If you do not select this option, you need to manually start or stop the migration. If you select this option, the migration runs during the specified period and stops beyond that period. For example: <ul style="list-style-type: none"> If you set Start Time to 08:00 and End Time to 12:00, the migration task runs from 08:00 to 12:00 every day. The migration stops beyond that period. If you set Start Time to 12:00 and End Time to 08:00, the migration runs from 12:00 of the current day to 08:00 of the next day. The migration stops beyond that period. 	-

Step 9 Click **Next: Confirm**.

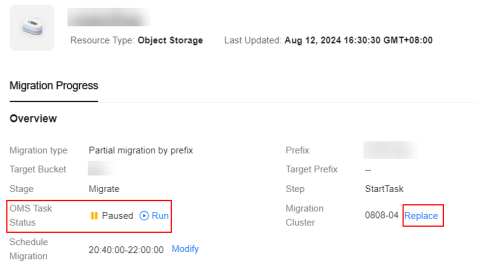
Step 10 Confirm the workflow settings, and click **Confirm**. The **Run Workflow** dialog box is displayed, which indicates that the workflow has been created.

- If you want to start the migration immediately, click **Confirm** to run the workflow.
- If you want to **add a stage or step** to the workflow, click **Cancel**. The workflow enters a **Waiting** state, and the migration is not started. To start the migration, click **Run** in the **Operation** column.

Step 11 On the migration workflow details page, view the workflow settings and the migration progress. You can also perform the following operations:

- Move the cursor to the migration progress bar of a resource. In the displayed window, view the migration details about the resource.
- When a migration reaches a step that requires manual confirmation, place the cursor on the progress bar and click **Confirm** next to the step status in the displayed window. The migration can continue only after you confirm.
- In the **Basic Information** area, click **Manage** next to the cluster name. The cluster details page is displayed on the right. On the displayed page, you can:
 - Add, edit, or delete traffic limiting rules to control cluster traffic based on your requirements.
 - Add or delete migration nodes or list nodes, or upgrade plug-ins for existing nodes as required.

Step 12 (Optional) Click the migration progress bar or click **Migration Progress** in the window displayed when you move the cursor to the progress bar. The migration details page is displayed on the right. You can view the task overview and progress details. You can also perform the following operations:

Operation	Description
<p>Change the migration cluster.</p>	<p>You can change the migration cluster only when the migration task (workflow) is Paused.</p>  <p>1. In the Overview area, click Replace next to the migration cluster name.</p> <p>2. In the displayed dialog box, select a new cluster from the drop-down list and click Confirm. After the cluster is changed, the workflow starts to run automatically.</p>
<p>Modify the migration schedule.</p>	<p>1. In the Overview area, click Modify next to Schedule Migration.</p> <p>2. Set Start Time and End Time, and click Confirm.</p>
<p>Modify the number of concurrent subtasks.</p>	<p>1. In the Progress area, click Modify under Expected Concurrent Subtasks to change the expected number of concurrent subtasks. There cannot be more than 10 concurrent subtasks for each online migration node. For example, if there are 2 online migration nodes, the maximum number of subtasks can be 20 or any number below.</p> <p>2. Click Confirm.</p>
<p>Add traffic limiting rules.</p>	<p>1. In the Migration Speed area, click Add to add a rule to limit the bandwidth the migration can use in a specified period.</p> <p>NOTICE</p> <ul style="list-style-type: none"> - The bandwidth limit ranges from 1 MB to 1,024 GB. - Time periods in different rules cannot overlap. For example, if there is a rule added for the period from 8:00 to 12:00, you cannot configure rules for any overlapped periods, such as from 7:00 to 13:00, 7:00 to 8:00, and 9:00 to 12:00. - The start time of a rule cannot be later than the end time. For example, the time period from 23:00 to 01:00 is not allowed. <p>2. Click Save.</p>

Operation	Description
Obtain the list of files that fail to be migrated, skipped or migrated.	In the File Statistics area, view the path of the list of files that failed to be migrated, skipped, or migrated. Click a file path, and it will take you to the OBS bucket where the list is stored. You can download the list from the bucket.
View traffic statistics.	In the Traffic Statistics area, view the migration traffic in the last hour, last 6 hours, last 24 hours, or the entire migration period.

----End

Source Data Filters

The following table describes the rules and restrictions for setting source data filters.

Table 2-57 Filter options

Option	Description	Patten Rule	Constraint
Exclude Patterns	If a file matches any excluded pattern, the file will not be migrated or compared for consistency. Both exact match and fuzzy match are supported.	<ul style="list-style-type: none"> Exact match You need to specify absolute paths and use slashes (\) to escape special characters in the paths. 	<ul style="list-style-type: none"> Except for {}, consecutive characters specified in pattern rules are not allowed, for example, <code>***</code>, <code>*?</code>, <code>**?</code>, <code>?*</code>, <code>?**</code>, <code>*{*,}*</code>, <code>*}{*,*}</code>, <code>?{*</code>, <code>{*}</code>, <code>{,}</code>, <code>{*,,,*}</code>, and <code>,*</code>.
Include Patterns	<ul style="list-style-type: none"> If no included patterns are specified, all files in the source will be migrated. If included patterns are specified, only the files whose absolute paths match the specified patterns will be migrated or compared for consistency. 		<ul style="list-style-type: none"> Only asterisks (*) can be used as wildcard characters in {}. {1} cannot be nested in {0}. Excluded patterns take precedence over included patterns. Semicolons (;) are used to separate patterns outside {}.

Option	Description	Pattern Rule	Constraint
		<p>CAUTION Precautions for configuring exclude and include patterns:</p> <ul style="list-style-type: none"> If the file system address ends with <code>:/</code>, when you configure the paths to be excluded or included, enter their absolute paths relative to the mount point. For example, if the file system address is 192.1.1.1:/ and the mount point is /mnt/turbo, enter absolute paths relative to /mnt/turbo. <p>For example: <pre>[root@oms-cluster-ecs-filter_test]# pwd /mnt/sts_turbo/mgc/filter_test [root@oms-cluster-ecs-filter_test]# ll drwxr-xr-x 2 root root 0 Aug 16 15:27 test2 -rw-r--r-- 1 root root 5 Aug 16 15:27 test2.log</pre> To exclude the test2.log file from the migration, you can enter its absolute path /mgc/filter_test/test2.log in the Exclude</p>	

Option	Description	Patten Rule	Constraint
		<ul style="list-style-type: none"> • Fuzzy match <ul style="list-style-type: none"> - An asterisk (*) matches zero or more characters except for slashes (/). - A pair of asterisks (**) matches zero or more characters including slashes (/). - A question mark (?) matches exactly one character, but not slashes (/). - Commas (,) are used to separate patterns in {}. Patterns in {} are in an OR relationship. - Wildcard characters asterisk (*) and question mark (?) are escaped by backslashes (\). In other cases, a backslash (\) means itself. 	

Option	Description	Patten Rule	Constraint
Time Range	Filters files and directories to be migrated based on when they were last modified. Only files and directories whose last modification times fall in the configured time range will be migrated. The start time and end time can be left empty. If they are left empty, the system will not filter out source files by time. The time can be precise to the minute.		

The following table lists example pattern rules for different scenarios.

NOTICE

Assume that you want to migrate the directory **test** in the source storage system.

- If the source storage system is a NAS device, enter **/test** as an "include" pattern.
- If the source storage system is an object storage system, enter **test** as an "include" pattern.

Scenario	Example Pattern for NAS	Example Pattern for Object Storage	Description
File paths that end with <i>xx</i>	<i>/xx /**xx</i>	<i>xx/**xx</i>	<i>xx</i> can be an expression containing asterisks (*) and question marks (?).
Files whose names start with <i>xx</i> in the root directory	<i>/xx*</i> <ul style="list-style-type: none"> • /testssss matches the pattern. • /test/xx does not match the pattern. 	<i>/xx*</i> <ul style="list-style-type: none"> • testssss matches the pattern. • /test/xx does not match the pattern. 	
File paths that start with <i>xx</i>	<i>/xx**</i> <i>/xx/**</i>	<i>xx**</i> <i>xx/**</i>	
Files whose names contain <i>xx</i>	<i>**xx*</i>	<i>**xx*</i>	
File paths that contain <i>xx</i>	<i>**xx**</i>	<i>**xx**</i>	

Scenario	Example Pattern for NAS	Example Pattern for Object Storage	Description
File paths that start with <i>xx</i> and end with <i>yy</i> .	<code>/xx**yy</code>	<code>xx**yy</code>	<i>xx</i> and <i>yy</i> can be expressions containing asterisks (*) and question marks (?).
File paths that end with <i>xx</i> or <i>yy</i>	<code>**{xx,yy}</code>	<code>**{xx,yy}</code>	
Files whose names contain <i>xx</i> or <i>yy</i>	<code>**{xx,yy}*</code>	<code>**{xx,yy}*</code>	
Files paths that contain <i>xx</i> or <i>yy</i>	<code>**{xx,yy}**</code>	<code>**{xx,yy}**</code>	

2.10.5 Creating a Batch Object Storage Migration Workflow

This section describes how to create a workflow to efficiently migrate buckets in batches.

Notes and Constraints

- For more information, see [What Are the Restrictions on Using MgC for Storage Migration?](#)
- Data in the Deep Cold Archive storage of Alibaba Cloud OSS cannot be restored using the restoration function of MgC. You need to manually restore the data before migration.

Warnings

When you create a workflow, there are three options for **Overwrite Existing: Never, Always, and If older or different size**. If you choose **Never**, restarting the migration task after interruptions or pauses may cause incomplete data migration, but the task may still be displayed as successful, which affects data integrity. Use the **Never** option with caution.

Prerequisites

You have [created a batch object storage migration plan](#).

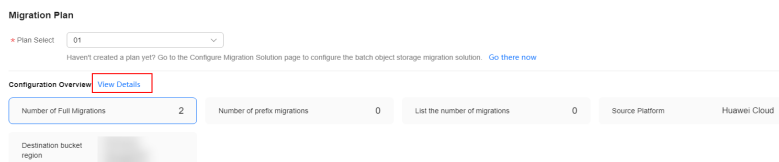
Procedure

- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane on the left, choose **Migrate > Workflows**. Select a [migration project](#) in the upper left corner of the page.
- Step 3** Click **Create Workflow** in the upper right corner of the page.
- Step 4** In the **Batch Object Storage Migration** card, click **Preview Steps** to view the stages and steps predefined in the template and the detailed description of each

stage and step. Steps of the **Automated** type will be automatically performed by MgC. Click **Configure Workflow** in the lower right corner.

Step 5 In the **Basic Information** area, enter a name and description for the workflow.

Step 6 In the **Migration Plan** area, select the created **migration plan**. Then you should view the overview of the migration plan. Click **View Details** to view more information about the plan.



Step 7 In the **Migration Cluster** area, select the cluster used for the migration. The cluster selected in the migration plan is used by default, but you can select another one if needed. The modification is applied to the current workflow but not to the migration plan.

Step 8 Configure the migration task based on [Table 2-58](#).

Table 2-58 Parameters for configuring a migration task

Parameter	Value	Description
Concurrent Subtasks	-	Set the maximum number of concurrent subtasks. There cannot be more than 10 concurrent subtasks for each online migration node. For example, if there are 2 online migration nodes, the maximum number of subtasks can be 20 or any number below.
Overwrite Existing	Never	Files existing at the migration target are never overwritten. WARNING <ul style="list-style-type: none"> If you choose Never for the initial migration, the attributes of involved parent folders at the source will not be migrated to the target. As a result, the folder attributes may be incomplete at the target. To avoid this issue, use the Never option with caution for the initial migration. If a migration task is paused or interrupted and then restarted or resumed, the Never option will cause the system to skip files that were not completely migrated earlier, but the task may still be marked as successful. This affects data integrity. To avoid this issue, use the Never option with caution.
	Always	Files existing at the migration target are always overwritten.

Parameter	Value	Description
	If older or different size	<ul style="list-style-type: none"> Files that already exist at the target will be overwritten if they are older than or have different sizes from the paired files at the source. Verification will be performed for folders after their contents are migrated. Folders that already exist at the target will be overwritten if they have different last modification times, sizes, or permissions from the paired folders at the source. <p>NOTE For empty folders, the overwrite policy is the same as that for files.</p>
Migrate Metadata	-	<p>Decide whether to migrate metadata.</p> <ul style="list-style-type: none"> If you select this option, object metadata will be migrated. If you do not select this option, only the Content-Type and Content-Encoding metadata will be migrated.

Step 9 (Optional) Configure advanced options based on [Table 2-59](#).

Table 2-59 Advanced options

Parameter	Description
Target Storage Class	Choose the storage class that your data will be migrated to in the target bucket. For details about storage classes, see Introduction to Storage Classes .
Enable KMS Encryption	<ul style="list-style-type: none"> If you do not select this option, whether migrated data will be encrypted in the target bucket depends on the server-side encryption setting of the bucket. If you select this option, all migrated objects will be encrypted before they are stored in the target bucket. <p>NOTE</p> <ul style="list-style-type: none"> Using KMS to encrypt migrated data may slow down the migration speed by about 10%. This option is only available when KMS is supported in the region you are migrating to.

Parameter	Description
Restore Archive Data	<ul style="list-style-type: none"> If you do not select this option, the system records archive objects in the list of objects that failed to be migrated and continues to migrate other objects in the migration task. If you select this option, the system automatically restores and migrates archive objects in the migration task. If an archive object fails to be restored, the system skips it and records it in the list of objects that failed to be migrated and continues to migrate other objects in the migration task. <p>NOTE The system will restore archive data before migrating it, and you pay the source cloud platform for the API requests and storage space generated accordingly.</p>
Filter Source Data	Filter files to be migrated by applying filters. For details about the filters, see Source Data Filters .
Download Data from CDN	<p>If the default domain name cannot meet your migration requirements, then as long as the source cloud service provider supports custom domain names, you can bind a custom domain name to the source bucket, and enable the CDN service on the source platform to reduce data download expenses. Enter a custom domain name in the Domain Name text box and select a transmission protocol. HTTPS is more secure than HTTP and is recommended.</p> <p>If the migration source is the Alibaba Cloud OSS or Tencent Cloud COS, you also need to select an authentication type and enter an authentication key.</p>
Send SMN Notification	<p>Determine whether to use SMN to get notifications about migration results.</p> <ul style="list-style-type: none"> If you do not select this option, no SMN messages are sent after the migration. If you select this option, after the migration, SMN messages are sent to the subscribers of the selected topic. You can select the language and trigger conditions for sending messages.

Parameter	Description
Limit Traffic	<p>Allocate the maximum bandwidth to be used by the workflow during a specified period.</p> <ul style="list-style-type: none">• If you do not select this option, migration traffic is not limited.• If you select this option, limit the migration traffic by setting Start Time, End Time, and Bandwidth Limit. For example, if you set Start Time to 08:00, End Time to 12:00, and Bandwidth Limit to 20 MB/s, the maximum migration speed is limited to 20 MB/s when the migration task runs from 08:00 to 12:00. The migration speed is not limited beyond this period. <p>NOTE</p> <ul style="list-style-type: none">- The rate limit ranges from 0 MB/s to 1,048,576 MB/s.- A maximum of five rules can be added.- The time is the local standard time of the region you are migrating to.

Step 10 Click **Next: Confirm**.

Step 11 Confirm the workflow settings, and click **Confirm**. The **Run Workflow** dialog box is displayed, which indicates that the workflow has been created.

- If you want to start the migration immediately, click **Confirm** to run the workflow.
- If you want to **add a stage or step** to the workflow, click **Cancel**. The workflow enters a **Waiting** state, and the migration is not started. To start the migration, click **Run** in the **Operation** column.

Step 12 On the migration workflow details page, view the workflow settings and the migration progress. You can also perform the following operations:

- Move the cursor to the migration progress bar of a resource. In the displayed window, view the migration details about the resource.
- When a migration reaches a step that requires manual confirmation, place the cursor on the progress bar and click **Confirm** next to the step status in the displayed window. The migration can continue only after you confirm.
- In the **Basic Information** area, click **Manage** next to the cluster name. The cluster details page is displayed on the right. On the displayed page, you can:
 - Add, edit, or delete traffic limiting rules to control cluster traffic based on your requirements.
 - Add or delete migration nodes or list nodes, or upgrade plug-ins for existing nodes as required.

----End

2.10.6 Creating a Batch File Storage Migration Workflow

This section describes how to create a workflow to efficiently migrate file systems in batches.

Notes and Constraints

For more information, see [What Are the Restrictions on Using MgC for Storage Migration?](#)

Warnings

When you create a workflow, there are three options for **Overwrite Existing**: **Never**, **Always**, and **If older or different size**. If you choose **Never**, restarting the migration task after interruptions or pauses may cause incomplete data migration, but the task may still be displayed as successful, which affects data integrity. Use the **Never** option with caution.

Prerequisites

You have [created a batch file storage migration plan](#).

Procedure

- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane on the left, choose **Migrate > Workflows**. Select a [migration project](#) in the upper left corner of the page.
- Step 3** Click **Create Workflow** in the upper right corner of the page.
- Step 4** In the **Batch File Storage Migration** card, click **Preview Steps** to view the stages and steps predefined in the template and the detailed description of each stage and step. Steps of the **Automated** type will be automatically performed by MgC. Click **Configure Workflow** in the lower right corner.



Batch File Storage Migration

A template used for batch migrating file storage data to Huawei Cloud over dedicated migration clusters and private networks.

File storage migration Dedicated migration clusters

- Migrate
- Complete cutover

[Preview Steps](#)

[Configure Workflow](#)

- Step 5** In the **Basic Information** area, enter a name and description for the workflow.
- Step 6** In the **Migration Plan** area, select the created [migration plan](#). Then you should view the overview of the migration plan. Click **View Details** to view more information about the plan.



Step 7 In the **Migration Cluster** area, select the cluster used for the migration. The cluster specified in the migration plan is preselected by default, but you can select another one if needed. The modification is applied to the current workflow but not to the migration plan.

Step 8 Configure the migration task based on [Table 2-60](#).

Table 2-60 Parameters for configuring a migration task

Parameter	Value	Description
Concurrent Subtasks	-	Set the maximum number of concurrent subtasks. There cannot be more than 10 concurrent subtasks for each online migration node. For example, if there are 2 online migration nodes, the maximum number of subtasks can be 20 or any number below.
Overwrite Existing	Never	Files existing at the migration target are never overwritten. WARNING <ul style="list-style-type: none"> If you choose Never for the initial migration, the attributes of involved parent folders at the source will not be migrated to the target. As a result, the folder attributes may be incomplete at the target. To avoid this issue, use the Never option with caution for the initial migration. If a migration task is paused or interrupted and then restarted or resumed, the Never option will cause the system to skip files that were not completely migrated earlier, but the task may still be marked as successful. This affects data integrity. To avoid this issue, use the Never option with caution.
	Always	Files existing at the migration target are always overwritten.
	If older or different size	<ul style="list-style-type: none"> Files that already exist at the target will be overwritten if they are older than or have different sizes from the paired files at the source. Verification will be performed for folders after their contents are migrated. Folders that already exist at the target will be overwritten if they have different last modification times, sizes, or permissions from the paired folders at the source. NOTE For empty folders, the overwrite policy is the same as that for files.
Migrate Metadata	-	Decide whether to migrate metadata. <ul style="list-style-type: none"> If you select this option, object metadata will be migrated. If you do not select this option, only the Content-Type and Content-Encoding metadata will be migrated.

Step 9 (Optional) Configure advanced options based on [Table 2-61](#).

Table 2-61 Advanced options

Parameter	Description
Sync Incremental Before Cutover	<ul style="list-style-type: none"> If you select Yes, an incremental migration step will be automatically added after the migration verification step in the migration phase. If you select No, the service cutover phase starts after the migration verification step in the migration phase is complete.
Filter Source Data	Filter files and directories to be migrated by applying filters. For details about the filters, see Source Data Filters .
Send SMN Notification	<p>Determine whether to use SMN to get notifications about migration results.</p> <ul style="list-style-type: none"> If you do not select this option, no SMN messages will be sent after the migration is complete. If you select this option, after the migration is complete, SMN messages are sent to the subscribers of the selected topic. You can select the language and trigger conditions for sending messages.
Limit Traffic	<p>Allocate the maximum bandwidth to be used by the workflow during a specified period.</p> <ul style="list-style-type: none"> If you do not select this option, migration traffic is not limited. If you select this option, limit the migration traffic by setting Start Time, End Time, and Bandwidth Limit. For example, if you set Start Time to 08:00, End Time to 12:00, and Bandwidth Limit to 20 MB/s, the maximum migration speed is limited to 20 MB/s when the migration runs from 08:00 to 12:00. The migration speed is not limited beyond this period. <p>NOTE</p> <ul style="list-style-type: none"> The bandwidth limit ranges from 0 MB/s to 1,048,576 MB/s. A maximum of five rules can be added. The time is the local standard time of the region you are migrating to.

Step 10 Click **Next: Confirm**.

Step 11 Confirm the workflow settings, and click **Confirm**. The **Run Workflow** dialog box is displayed, which indicates that the workflow has been created.

- If you want to start the migration immediately, click **Confirm** to run the workflow.

- If you want to **add a stage or step** to the workflow, click **Cancel**. The workflow enters a **Waiting** state, and the migration is not started. To start the migration, click **Run** in the **Operation** column.

Step 12 In the workflow list, click the workflow name to go to its details page. You can view the configuration information and migration progress of the workflow. You can also perform the following operations:

- Move the cursor to the migration progress bar of a resource. In the displayed window, view the migration details about the resource.
- When a migration reaches a step that requires manual confirmation, place the cursor on the progress bar and click **Confirm** next to the step status in the displayed window. The migration can continue only after you confirm.
- In the **Basic Information** area, click **Manage** next to the migration cluster name. The cluster details page is displayed on the right. On the displayed page, you can:
 - Add, edit, or delete traffic limiting rules to control cluster traffic based on your requirements.
 - Add or delete migration nodes or list nodes, or upgrade plug-ins for existing nodes as required.

----End

2.10.7 Adding a Stage or Step

You can customize a migration workflow to fit your requirements better by adding stages or steps to the workflow.

CAUTION

- You can only add a stage before or after an existing stage when the existing stage is in **Waiting** or **Paused** state. This is true for step additions.
 - If the previous stage is in **Running**, **Paused**, or **Complete** state, you can only add a stage after the existing stage. This is also true for step additions.
 - You cannot add steps after repeatable steps.
-

Adding a Stage

Step 1 On the migration workflow details page, move the cursor to the migration stage before or after which you want to add a stage. In the displayed window, choose **Add Stage Before** or **Add Stage After**.

Step 2 Enter a stage name and description, click **Add Step**, select a step type, enter a step name and description, and click **Confirm**. Multiple steps can be added.

Step 3 Click **Confirm**.

NOTICE

Manually added stages can be modified or deleted, but pre-defined stages cannot.

----End

Adding a Step

- Step 1** On the migration workflow details page, move the cursor to the step before or after which you want to add a step. In the displayed window, choose **Add Step Before** or **Add Step After**.
- Step 2** Select a step type based on [Table 2-62](#), enter a step name and description, and click **Confirm**.

Table 2-62 Step types

Type	Description
Checkpoint	You need to manually confirm this type of steps, so that the workflows can continue.

- Step 3** Go back to the migration stage and view the added step.

NOTICE

Manually added steps can be modified or deleted, but pre-defined steps cannot.

----End

2.11 Big Data Migration

2.11.1 Precautions

Notes and Constraints

- MgC cannot migrate the DATETIME type of data from MaxCompute. Before the migration, you need to convert such data to the STRING format.
- MgC cannot migrate the VARCHAR or CHAR type of data from MaxCompute. Before the migration, you need to convert such data to the STRING format.
- MgC cannot migrate the metadata of transaction tables (those with the **transactional=true** field in DDL statements).
- The TIMESTAMP_NTZ type of data in MaxCompute is not supported by the Alibaba Cloud SDK. As a result, the metadata of involved tables will fail to be migrated.

Notes

- Editing a CSV template file
When using the CSV template provided by MgC to filter data, do not use Excel to edit the CSV file. The file edited and saved in Excel cannot be identified by MgC.

- Selecting a DLI connection
Metadata migration and data migration require different DLI connections. Metadata migration requires a DLI connection with a SQL queue configured, and data migration requires a DLI connection with a general-purpose queue configured. If an incorrect connection is configured for the migration task, the migration task will fail.
- Constraints on the number of databases
During the metadata migration, MgC automatically creates the same number of databases identified in metadata on DLI. A maximum of 10 DLI databases can be created in an account. If the number of databases you want to migrate exceeds the quota, the metadata migration may fail.

2.11.2 Preparations

To ensure a smooth migration, you need to make the following preparations.

Preparing a Huawei Account

Before using MgC, prepare a HUAWEI ID or an IAM user that can access MgC and obtain an AK/SK pair for the account or IAM user. For details, see [Making Preparations](#).

Obtaining an AK/SK Pair for Your Alibaba Cloud Account

Obtain an AK/SK pair for your Alibaba Cloud account. For more information, see [Viewing the AccessKey Pairs of a RAM User](#).

Ensure that the AK/SK pair has the following permissions:

- **AliyunReadOnlyAccess**: read-only permission for OSS
- **AliyunMaxComputeReadOnlyAccess**: read-only permission for MaxCompute

For details about how to obtain these permissions, see [Granting Permissions to RAM Users](#).

(Optional) If there are partitioned tables to be migrated, grant the **Information Schema** permission to the source account. For details, see [Authorization for RAM Users](#).

Creating a Migration Project

On the MgC console, create a migration project. For details, see [Managing Migration Projects](#).

Configuring an Agency

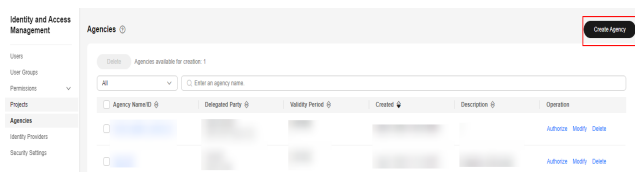
To ensure that DLI functions can be used properly, you need to configure an agency with DLI and OBS permissions.

Step 1 Sign in to the Huawei Cloud management console.

Step 2 Hover the mouse over the username in the upper right corner and choose **Identity and Access Management** from the drop-down list.

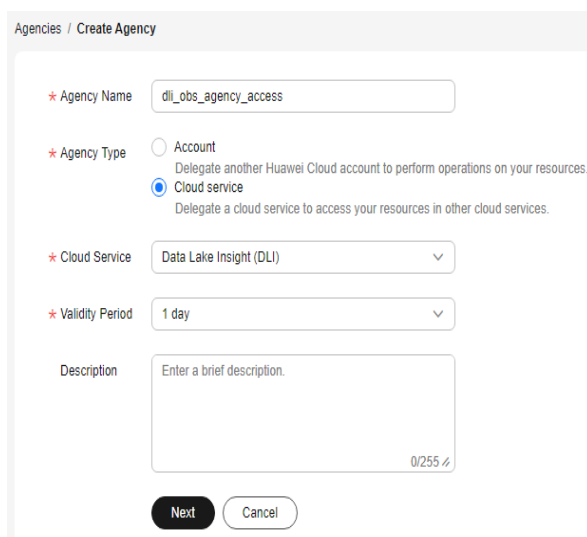
Step 3 In the navigation pane, choose **Agencies**.

Step 4 Click **Create Agency**.



Step 5 On the **Create Agency** page, set the following parameters:

- **Agency Name:** Set a name, for example, **dli_obs_agency_access**.
- **Agency Type:** Select **Cloud service**.
- **Cloud Service:** Select **(Data Lake Insight) DLI** from the drop-down list.
- **Validity Period:** Set a period as needed.
- **Description:** This parameter is optional.



Step 6 Click **Next**. The **Select Policy/Role** tab is displayed.

Step 7 Click **Create Policy** in the upper right corner. Create two policies (one for OBS and one for DLI) by referring to [Step 8](#) and [Step 9](#). If there are existing policies containing the required permissions, you can use them and skip this step, as well as steps 8 and 9.

Step 8 Configure policy information.

1. **Policy Name:** Set a name, for example, **dli-obs-agency**.
2. **Policy View:** Select **JSON**.
3. Copy and paste the following content to the **Policy Content** box.



Replace **bucketName** with the name of the bucket where the JAR packages are stored.

```
{
  "Version": "1.1",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "obs:bucket:GetBucketPolicy",
        "obs:bucket:GetLifecycleConfiguration",
        "obs:bucket:GetBucketLocation",
        "obs:bucket:ListBucketMultipartUploads",
        "obs:bucket:GetBucketLogging",
        "obs:object:GetObjectVersion",
        "obs:bucket:GetBucketStorage",
        "obs:bucket:GetBucketVersioning",
        "obs:object:GetObject",
        "obs:object:GetObjectVersionAcl",
        "obs:object:DeleteObject",
        "obs:object:ListMultipartUploadParts",
        "obs:bucket:HeadBucket",
        "obs:bucket:GetBucketAcl",
        "obs:bucket:GetBucketStoragePolicy",
        "obs:object:AbortMultipartUpload",
        "obs:object:DeleteObjectVersion",
        "obs:object:GetObjectAcl",
        "obs:bucket:ListBucketVersions",
        "obs:bucket:ListBucket",
        "obs:object:PutObject"
      ],
      "Resource": [
        "OBS:*:*:bucket:bucketName", //Replace bucketName with the name of the bucket where
the JAR packages are stored.
        "OBS:*:*:object:*"
      ]
    },
    {
      "Effect": "Allow",
      "Action": [
        "obs:bucket:ListAllMyBuckets"
      ]
    }
  ]
}
```

Step 9 Configure policy information.

1. **Policy Name:** Set a name, for example, **dli-agency**.
2. **Policy View:** Select **JSON**.
3. Copy and paste the following content to the **Policy Content** box.

```
{
  "Version": "1.1",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "dli:table:showPartitions",
        "dli:table:alterTableAddPartition",
        "dli:table:alterTableAddColumns",
        "dli:table:alterTableRenamePartition",
        "dli:table:delete",
        "dli:column:select",
        "dli:database:dropFunction",
        "dli:table:insertOverwriteTable",
        "dli:table:describeTable",
        "dli:database:explain",
        "dli:table:insertIntoTable",
        "dli:database:createDatabase",
        "dli:table:alterView",
        "dli:table:showCreateTable",

```

```
"dli:table:alterTableRename",
"dli:table:compaction",
"dli:database:displayAllDatabases",
"dli:database:dropDatabase",
"dli:table:truncateTable",
"dli:table:select",
"dli:table:alterTableDropColumns",
"dli:table:alterTableSetProperties",
"dli:database:displayAllTables",
"dli:database:createFunction",
"dli:table:alterTableChangeColumn",
"dli:database:describeFunction",
"dli:table:showSegments",
"dli:database:createView",
"dli:database:createTable",
"dli:table:showTableProperties",
"dli:database:showFunctions",
"dli:database:displayDatabase",
"dli:table:alterTableRecoverPartition",
"dli:table:dropTable",
"dli:table:update",
"dli:table:alterTableDropPartition"
    ]
  }
}
```

Step 10 Click **Next**.

Step 11 Select the created custom policies with OBS and DLI permissions and click **Next**. Set **Scope** to **All resources**.

Step 12 Click **OK**. It takes 15 to 30 minutes for the authorization to be in effect.

Step 13 Update the agency permissions by referring to [Updating DLI Agency Permissions](#).

----End

Creating a VPC

Before purchasing an ECS, you need to create a VPC and subnet for it. For details, see [Creating a VPC and Subnet](#).

CAUTION

The VPC of the ECS must not conflict with the CIDR block used by the DLI elastic resource pool you prepare below. When you create a DLI queue, the preset CIDR block is 172.16.0.0/18.

Purchasing an ECS

- Purchase a Linux ECS. The ECS and the DLI resources you prepare later must be in the same region. For details, see [Purchasing an ECS](#). Select the [created VPC and subnet](#) for the ECS. The ECS must:
 - Be able to access the Internet and the domain names of MgC, IoTDA, and other cloud services. For details about the domain names to be accessed, see [Domain Names](#).
 - Allow outbound traffic on 8883 if the ECS is in a security group.

- Run CentOS 8.X.
- Have at least 8 vCPUs and 16 GB of memory.
- Configure an EIP for the ECS, so that the ECS can access the Internet. For details, see [Assigning an EIP](#) and [Binding an EIP to an ECS](#).
 - **Billing Mode:** Select **Pay-per-use**.
 - **Bandwidth:** 5 Mbit/s is recommended.

Installing Edge and Connecting Edge to MgC

- On the purchased ECS, install Edge, which will be used for data verification. For details, see [Installing Edge for Linux](#).
- Register an Edge account. In the address box of a browser, enter the NIC IP address of the Linux ECS and port 27080, for example, https://x.x.x.x:27080. After the first login, the registration page is displayed. Enter a username and password, confirm the password, and click **Privacy Statement**. Read the statement carefully, select **I have read and agree to the Privacy Statement**, and click **OK** to complete the registration.
- [Connect Edge to MgC](#).



CAUTION

Edge does not support automatic restart. Do not restart Edge during task execution, or tasks will fail.

Adding Credentials

On the Edge console, add the AK/SK pairs of your Alibaba Cloud account and Huawei Cloud account. For details, see [Adding Resource Credentials](#).

- Enter the AK/SK pair of your source Alibaba Cloud account. This key pair will be used to access your MaxCompute resources.

Add Credential

* Resource Type	Bigdata
* Resource Subtype	MaxCompute
* Credential Name	<input type="text"/>
* Authentication Method	AK/SK
* ak	<input type="text" value="ak"/>
* sk	<input type="text" value="sk"/>
<input type="button" value="Cancel"/> <input type="button" value="OK"/>	

- Enter the AK/SK pair of your Huawei Cloud account. This key pair will be used to access your DLI resources.

Add Credential

* Resource Type

* Resource Subtype

* Credential Name

* Authentication Method

* ak

* sk

Creating an OBS Bucket and Uploading JAR Packages

Create a bucket on Huawei Cloud OBS and upload the Java files (in JAR packages) that data migration depends on to the bucket. For details about how to create an OBS bucket, see [Creating a Bucket](#). For details about how to upload files, see [Uploading an Object](#).

The JAR packages that data migration depends on are **migration-dli-spark-1.0.0.jar**, **fastjson-1.2.54.jar**, and **datasource.jar**. Below, you'll find a description of what each package is used for and how to obtain them.

- **migration-dli-spark-1.0.0.jar**
 - This package is used to create Spark sessions and submit SQL statements.
 - You can obtain the package from the `/opt/cloud/Edge/tools/plugins/collectors/bigdata-migration/dliSpark` directory on the [ECS where Edge is installed](#).
- **fastjson-1.2.54.jar**
 - This package provides fast JSON conversion.
 - You can obtain the package from the `/opt/cloud/Edge/tools/plugins/collectors/bigdata-migration/deltaSpark` directory on the [ECS where Edge is installed](#).
- **datasource.jar**
 - This package contains the configuration and connection logic of data sources and allows Edge to connect to different databases or data storage systems.
 - You need to obtain and compile files in **datasource.jar** as required..


Purchasing an Elastic Resource Pool and Adding a Queue on DLI

An elastic resource pool provides compute resources (CPU and memory) required for running DLI jobs. For details about how to buy a resource pool, see [Buying an Elastic Resource Pool](#).

You can add a general-purpose queue and an SQL queue to the pool for running jobs. For more information, see [Creating Queues in an Elastic Resource Pool](#).

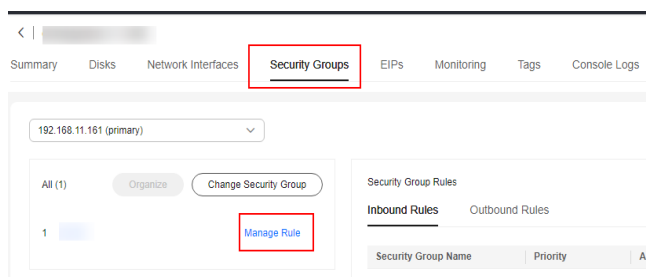
Creating an Enhanced Datasource Connection on DLI

Step 1 Sign in to the DLI console. In the navigation pane on the left, choose **Resources > Resource Pool**.

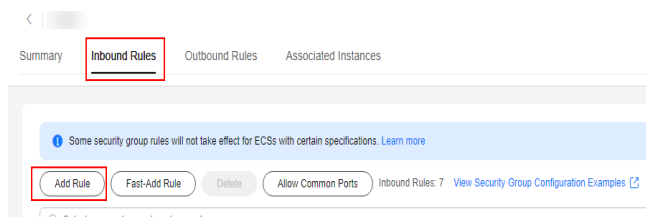
Step 2 Click  next to the name of the elastic resource pool. In the expanded information, obtain the CIDR block of the elastic resource pool.

Step 3 In the security group of the ECS with Edge installed, add an inbound rule to allow access from the CIDR block of the elastic resource pool.

1. Sign in to the ECS console.
2. In the ECS list, click the name of the Linux ECS with Edge installed.
3. Click the **Security Groups** tab and click **Manage Rule**.



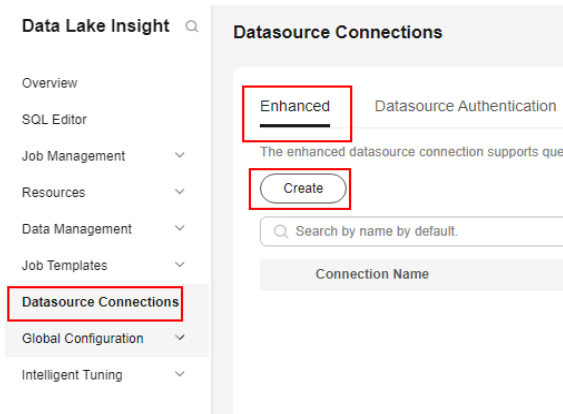
4. Under **Inbound Rules**, click **Add Rule**.



5. Configure parameters for the inbound rule.
 - **Priority:** Set it to **1**.
 - **Action:** Select **Allow**.
 - **Type:** Select **IPv4**.
 - **Protocol & Port:** Select **Protocols/All**.
 - Source: Select **IP Address** and enter the CIDR block of the elastic resource pool.
6. Click **OK**.

Step 4 Switch to the DLI console. In the navigation pane on the left, click **Datasource Connections**.

Step 5 Under **Enhanced**, click **Create**.



Step 6 Configure enhanced datasource connection information based on [Table 2-63](#).

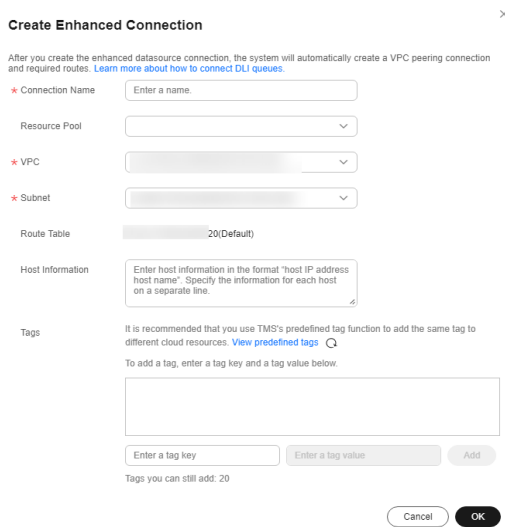


Table 2-63 Parameters required for creating an enhanced connection

Parameter	Configuration
Connection Name	Enter a name.
Resource Pool	Select the purchased elastic resource pool .
VPC	Select the created VPC and subnet .
Subnet	
Route Table	Retain the preset value.

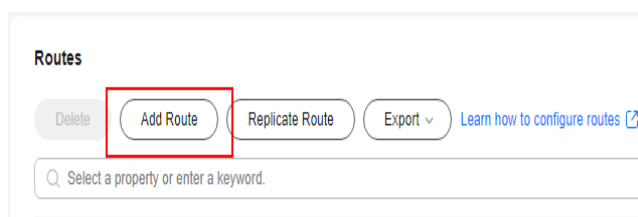
Parameter	Configuration
Host Information	<p>Add the information about the source MaxCompute hosts in the following format:</p> <p>EndpointIP Endpoint (with a space in between) TunnelEndpointIP TunnelEndpoint (with a space in between)</p> <p>Separate two pieces of information by pressing Enter. For example:</p> <pre>118.178.xxx.xx service.cn- hangzhou.maxcompute.aliyun.com.vipgds.alibabadns.com 47.97.xxx.xx dt.cn-hangzhou.maxcompute.aliyun.com</pre> <p>To obtain the values of EndpointIP and TunnelEndpointIP, use any server with a public IP address to ping the endpoint and tunnel endpoint of the region where the source MaxCompute cluster is located. The corresponding IP addresses will display in the command output.</p> <p>For details about MaxCompute endpoints and Tunnel endpoints, see Endpoints in different regions.</p>

Step 7 Click **OK**. After the creation process is finished, the **Connection Status** of the newly created connection will be **Active**, indicating that the connection has been successfully created.

----End

Adding and Configuring Routes

- Add routes.
Add two routes for the [DLI enhanced datasource connection](#). For details, see [Adding a Route](#). In the routes, the IP address must be the same as the host IP addresses configured during datasource connection creation.
- Configure routes.
 1. Sign in to the VPC console.
 2. In the navigation pane on the left, choose **Virtual Private Cloud > Route Tables**.
 3. In the route table list, click the route table used for creating a datasource connection (that is, the route table of the VPC where the ECS resides).
 4. Click **Add Route**.

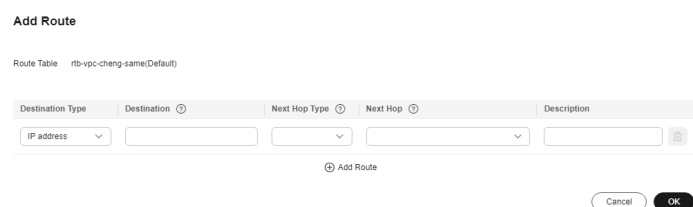


5. Set the parameters by following the instructions. You need to click



to add two routes.

- **Destination Type:** Select **IP address**.
- **Destination:** Enter the host IP address configured during datasource connection creation.
- **Next Hop Type:** Select **Server**.
- **Next Hop:** Select the **purchased ECS**.



Configuring SNAT Rules

Configure SNAT rules for the ECS by following the instructions below. Restarting the ECS will clear the rules, so you will need to reconfigure them after a restart.

Step 1 Log in to the **purchased ECS**.

Step 2 Run the following commands in sequence:

```
sysctl net.ipv4.ip_forward=1
```

This command is used to enable IP forwarding in Linux.

```
iptables -t nat -A POSTROUTING -o eth0 -s {CIDR block where the DLI elastic resource pool resides} -j SNAT --to {Private IP address of the ECS}
```

This command is used to set an iptables rule for network address translation.

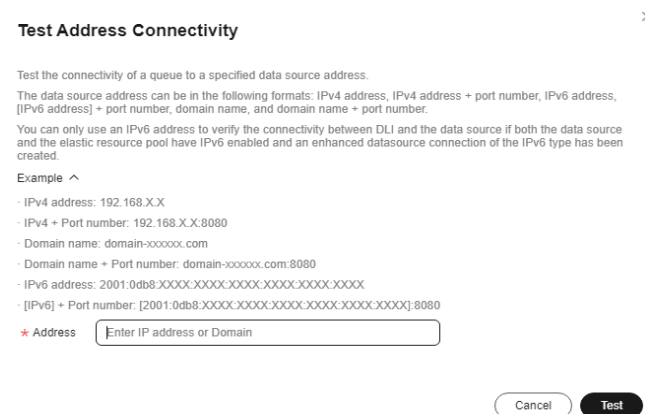
----End

Testing the Connectivity Between the DLI Queue and the Data Source

Step 1 Sign in to the DLI console. In the navigation pane on the left, choose **Resources > Queue Management**.

Step 2 Locate the elastic resource pool that **the DLI queue was added** and choose **More > Test Address Connectivity** in the **Operation** column.

Step 3 Enter the endpoint, endpoint IP address, Tunnel endpoint, and Tunnel endpoint IP address of MaxCompute to perform four connectivity tests. You are advised to use port 443.



Step 4 Click Test.

If the test address is reachable, you will receive a message.

If the test address is unreachable, you will also receive a message. Check the network configurations and try again. Network configurations include the VPC peering and the datasource connection. Check whether they have been activated.

----End

Adding to the DLI Spark 3.3 Whitelist and the JAR Program Whitelist for Metadata Access

Contact the DLI technical support to whitelist you to use the DLI Spark 3.3 feature and allow Jar access to DLI metadata.

(Optional) Enabling DLI Spark Lifecycle Whitelist

If the metadata to be migrated has a lifecycle (that is, the DDL contains the LIFECYCLE field), contact DLI technical support to enable the Spark lifecycle feature whitelist.

(Optional) Enabling the CIDR Block 100 Whitelist

If you use Direct Connect to migrate data, you need to request VPC support to enable the whitelist of the 100.100.x.x segment.

Submit a service ticket to the VPC service and provide the following information:

- Huawei Cloud account and project ID of the region where your DLI resources reside. For details about how to obtain them, see [API Credentials](#).
- DLI tenant name and tenant project ID: Contact DLI technical support to obtain them.

2.11.3 Creating a Source Connection

A source connection enables Edge to access and read data in Alibaba Cloud MaxCompute.

Prerequisites

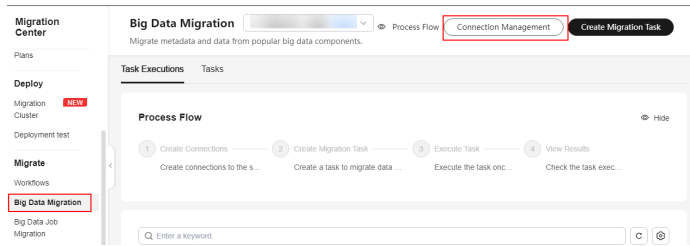
You have completed all [preparations](#).

Procedure

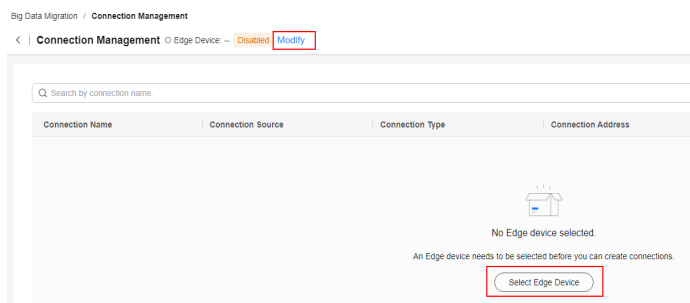
Step 1 Sign in to the [MgC console](#).

Step 2 In the navigation pane on the left, choose **Migrate > Big Data Migration**. In the upper left corner of the page, select the migration project created in [Preparations](#).

Step 3 Click **Connection Management** in the upper right corner of the page.



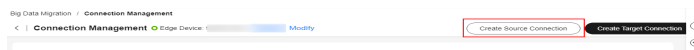
Step 4 If you are performing a big data migration on MgC for the first time, you need to select an Edge device to enable this migration feature. Click **Modify** in the upper left corner of the page or click **Select Edge Device**. In the drop-down list, select the Edge device you connected to MgC in [Making Preparations](#).



CAUTION

Ensure that the selected Edge device is always **Online** and **Enabled** until your migration is complete.

Step 5 Click **Create Source Connection** in the upper right corner of the page.



Step 6 On the **Select Connection Type** page, select **MaxCompute** and click **Next**.

Create Connection

1 Select Connection Type ——— 2 Configure Connection

Big Data Component

Select the component that provides metadata management.

- [Hive Metastore](#)
- [Doris](#)
- [HBase](#)
- [ClickHouse](#)
- [Glue](#)

Big Data Service

Cloud services for data query and computing.

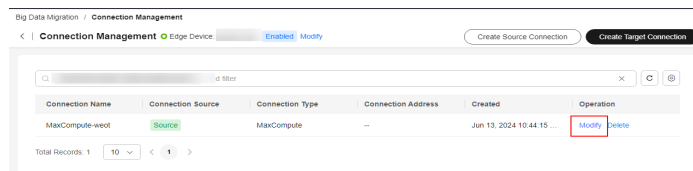
- [MaxCompute](#)

Step 7 Configure the [parameters for creating a MaxCompute connection](#), and click **Test**. If the test is successful, the connection is set up.

Table 2-64 Parameters for creating a MaxCompute connection

Parameter	Configuration
Connection To	Select Source .
Connection Name	The default name is MaxCompute-4 random characters (including letters and numbers). You can also customize a name.
Edge Device	Select the Edge device you connected to MgC in Preparations .
Alibaba Cloud Credential	Select the Alibaba Cloud credential (an AK/SK pair) you added on Edge in Making Preparations .
MaxCompute Project	Enter the name of the MaxCompute project where the data to be migrated is managed. You can obtain the project name from the Projects page on the MaxCompute console.
Endpoint	Enter the VPC endpoint of the region where the MaxCompute project is located. For details about the MaxCompute VPC endpoint in each region, see Endpoints in different regions (VPC) .

After the source connection is created, you can view it in the list on the **Connection Management** page. If necessary, click **Modify** in the **Operation** column to modify the connection configuration.



----End

2.11.4 Creating a Target Connection

A target connection is used to write source data to DLI.

Precautions

For a metadata migration, a DLI connection with an SQL queue configured is required.

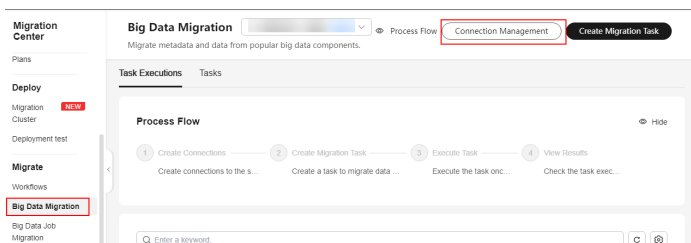
For a data migration, two DLI connections are required: one with an SQL queue configured and the other with a general queue.

Prerequisites

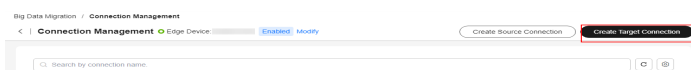
You have completed all **preparations**.

Procedure

- Step 1** Sign in to the **MgC console**.
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Migration**. In the upper left corner of the page, select the migration project created in **Preparations**.
- Step 3** Click **Connection Management** in the upper right corner of the page.



- Step 4** In the upper right corner of the page, click **Create Target Connection**.




- Step 5** On the **Select Connection Type** page, select **Data Lake Insight (DLI)** and click **Next**.



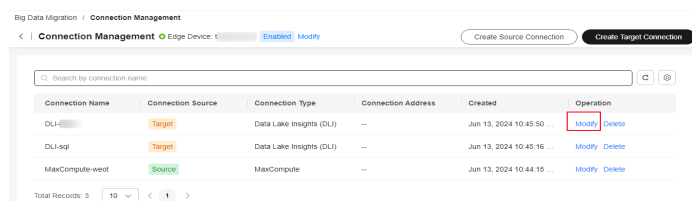
- Step 6** Configure the parameters listed in **Table 2-65**, and click **Test**. If the test is successful, the connection is set up.

Table 2-65 Parameters for creating a DLI connection

Parameter	Configuration
Connection To	Select Target .
Connection Name	The default name is DLI-4 random characters (including letters and numbers). You can also customize a name.

Parameter	Configuration
DLI Credential	Select the Huawei Cloud credential (an AK/SK pair) you added on Edge in Making Preparations . If the selected credential is the one you currently use to access MgC, you can select This is my MgC credential , and the projects in the region you choose will be listed.
Region	Select the region where your DLI resources are located. If you do not select This is my MgC credential , you need to manually enter the region code, for example, cn-north-1 .
Project	Select the project where your DLI resources are managed. Your source data will be managed in this project after being migrated. If you do not select This is my MgC credential , you need to manually enter the project ID. For details about how to obtain the project ID, see Obtaining Project Information . 
Queue	Enter the name of the SQL queue or general queue created in Purchasing an Elastic Resource Pool and Adding a Queue on DLI . <ul style="list-style-type: none"> • If you are creating a connection using an SQL queue, enter the name of the SQL queue. • If you are creating a connection using a general queue, enter the name of the general queue.

After the target connection is created, you can view it in the list on the **Connection Management** page. If necessary, click **Modify** in the **Operation** column to modify the connection configuration.



----End

2.11.5 Migrating Big Data

2.11.5.1 Migrating Full Metadata

Migrate all metadata from source databases to Huawei Cloud DLI.

NOTICE

The system cannot migrate the metadata of transaction tables (those with the **transactional=true** field in DDL statements).

Prerequisites

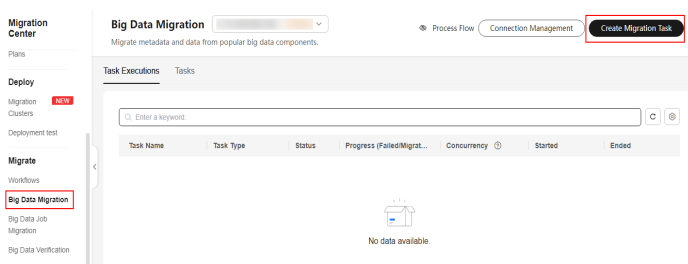
- You have completed all [preparations](#).
- [A source connection has been created](#).
- [Target connections have been created](#).

Procedure

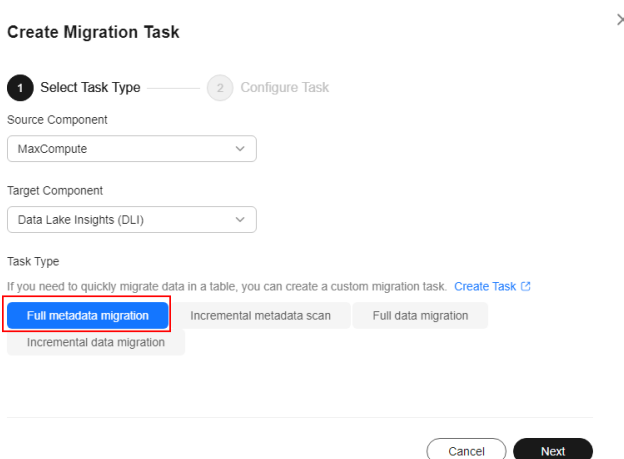
Step 1 Sign in to the [MgC console](#).

Step 2 In the navigation pane on the left, choose **Migrate > Big Data Migration**. In the upper left corner of the page, select the migration project created in [Preparations](#).

Step 3 In the upper right corner of the page, click **Create Migration Task**.

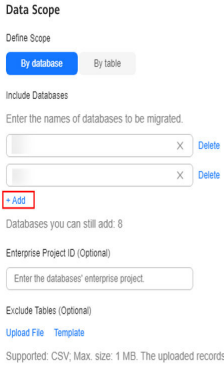


Step 4 Select **MaxCompute** for **Source Component**, **Data Lake Insight (DLI)** for **Target Component**, **Full metadata migration** for **Task Type**, and click **Next**.



Step 5 Set parameters required for creating a full metadata migration task based on [Table 2-66](#).

Table 2-66 Parameters required for creating a full metadata migration task

Area	Parameter	Configuration
Basic Settings	Task Name	The default name is Full-metadata-migration-from-MaxCompute-to-DLI-4 random characters (including letters and numbers). You can also customize a name.
	Edge Device	Select the Edge device you connected to MgC in Preparations .
Source Settings	Source Connection	Select the source connection you created .
	MaxCompute Parameters	The parameters are optional and usually left blank. If needed, you can configure the parameters by referring to MaxCompute Documentation .
Data Scope	By database	<p>Enter the names of databases to be migrated in the Include Databases text box. Click Add to add more entries. A maximum of 10 databases can be added.</p>  <p>If there are tables you do not want to migrate, download the template in CSV format under Exclude Tables, add information about these tables to the template, and upload the template to MgC. For details, see steps Step 5.2 to Step 5.5.</p>

Area	Parameter	Configuration
	By table	<ol style="list-style-type: none"> Download the template in CSV format. Open the downloaded CSV template file with Notepad. <p>CAUTION Do not use Excel to edit the CSV template file. The template file edited and saved in Excel cannot be identified by MgC.</p> Retain the first line in the CSV template file. From the second line onwards, enter the information about tables to be migrated in the format of {MaxCompute project name}, {Table name}. <i>MaxCompute project name</i> refers to the name of the MaxCompute project to be migrated. <i>Table name</i> refers to the data table to be migrated. <p>NOTICE</p> <ul style="list-style-type: none"> Use commas (,) to separate the MaxCompute project name and the table name in each line. Do not use spaces or other separators. After adding the information about a table, press Enter to start a new line. After all table information is added, save the changes to the CSV file. Upload the edited and saved CSV file to MgC.
	Enterprise Project ID (Optional)	Enter the ID of the enterprise project to which the target DLI databases belong. For details about how to obtain an enterprise project ID, see How Do I Obtain an Enterprise Project ID?
	Convert Internal Table To External	<ul style="list-style-type: none"> If you set this option to No, the migrated data will be stored in DLI. If you set this option to Yes, the migrated data will be stored in the OBS path you specify.
Target Settings	Overwriting Policy	<p>Select the policy for processing tables that already exist at the target.</p> <ul style="list-style-type: none"> Skip: Such tables will be skipped during the migration, and no operation will be performed on them. Rebuild: Such tables and the data in them will be deleted from the target, and new empty tables will be created at the target based on the source table settings.

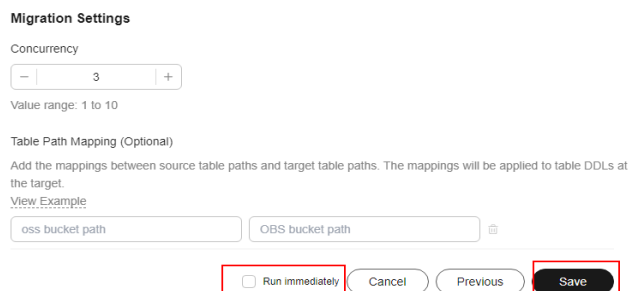
Area	Parameter	Configuration
	Target Connection	Select the DLI connection with a SQL queue you created. CAUTION Do not select the connection with a general queue configured.
	Custom Parameters	Configure the parameters as needed. For details, see Configuration parameter description and Custom Parameters .
	Table Type	Select an option as required.
	File Format	Select an option as required.
	Compression Format	Select an option as required.
Migration Settings	Concurrency	Set the number of concurrent migration subtasks. The default value is 3 . The value ranges from 1 to 10 .

Area	Parameter	Configuration
	(Optional) Table Path Mapping	<p>Map storage paths for metadata of external tables between the source and the target. This can help smoothly move the metadata of MaxCompute external tables from Alibaba OSS to Huawei Cloud OBS.</p> <p>The mapped paths in Huawei Cloud OBS must be created in advance. In the paths, the bucket names can be different, and other parts must be the same.</p> <p>Assume that at the source, external tables are stored in oss://oss-cn-hangzhou.aliyuncs.com/ali-test/documents/example_table. In the path, oss-cn-hangzhou.aliyuncs.com is the endpoint of the region where the involved bucket resides, ali-test is the bucket name, documents is the root directory of the bucket, and example_table is the directory that stores metadata of external tables (called table directory below). When you configure a mapped target path, the root directory and the table directory must remain unchanged, for example, obs://hw-test/documents/example_table.</p> <p>Example:</p> <ul style="list-style-type: none"> • Source: oss://oss-cn-hangzhou.aliyuncs.com/ali-test/documents/example_table • Target: obs://hw-test/documents/example_table <p>NOTE The preceding path mapping is only an example.</p>

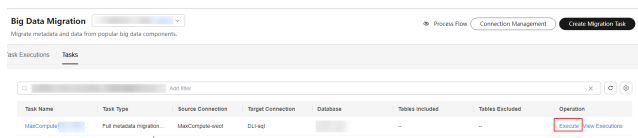
Step 6 After the configuration is complete, execute the task.

NOTICE

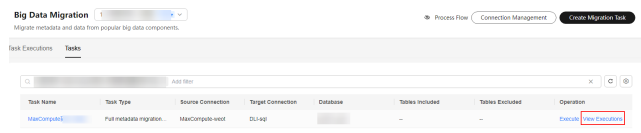
- A migration task can be executed repeatedly. Each time a migration task is executed, a task execution is generated.
- You can click the task name to modify the task configuration.
- You can select **Run immediately** and click **Save** to create the task and execute it immediately. You can view the created task on the **Tasks** page.



- You can also click **Save** to just create the task. You can view the created task on the **Tasks** page. To execute the task, click **Execute** in the **Operation** column.



Step 7 After the migration task is executed, click **View Executions** in the **Operation** column. On the **Task Executions** tab, you can view the details of the running task execution and all historical executions.



Click **View** in the **Progress** column. On the displayed page, [view and export the task execution results](#).

----End

2.11.5.2 Scanning for Incremental Metadata

Identify the metadata that has been changed in the source databases after the previous migration is complete, and synchronize the incremental metadata to Huawei Cloud CLI.

Prerequisites

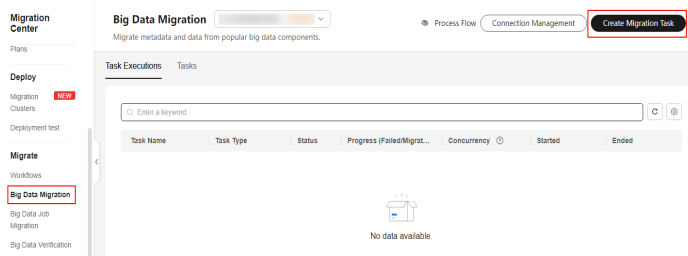
- A source connection has been created.**
- Target connections have been created.**
- At least a **full metadata migration** has been completed.

Preparations

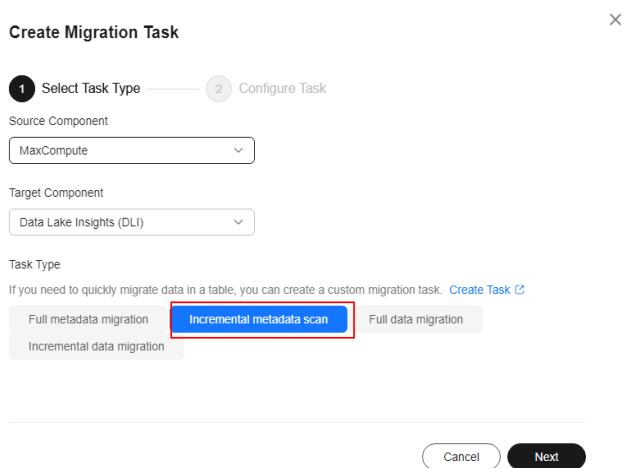
- Gain whitelist access to the Spark 3.3.1 feature.
Contact technical support to whitelist you to use the Spark 3.3.1 feature.
- Configure a DLI job bucket.
You need to purchase a bucket or parallel file system on OBS. The bucket is used to store temporary data generated by DLI. For details, see [Configuring a DLI Job Bucket](#).

Procedure

- Step 1** Sign in to the **MgC console**.
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Migration**. In the upper left corner of the page, select the migration project created in **Preparations**.
- Step 3** In the upper right corner of the page, click **Create Migration Task**.



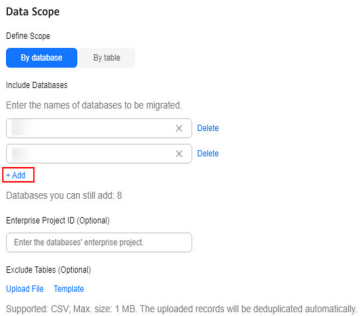
- Step 4** Select **MaxCompute** for **Source Component**, **Data Lake Insight (DLI)** for **Target Component**, **Incremental metadata scan** for **Task Type**, and click **Next**.



- Step 5** Configure parameters required for creating an incremental metadata scan based on **Table 2-67**.

Table 2-67 Parameters required for creating an incremental metadata scan

Area	Parameter	Configuration
Basic Settings	Task Name	The default name is Incremental-data-scan-of-MaxCompute-and-DLI-4 random characters (including letters and numbers). You can also customize a name.
	Edge Device	Select the Edge device you connected to MgC in Preparations .
Source Settings	Source Connection	Select the source connection you created .

Area	Parameter	Configuration
	Time Range	<ul style="list-style-type: none"> If you select All, MgC will scan for the incremental metadata generated in the source databases since the last metadata migration. If you select Custom, select a T-N option to limit the scan scope to the incremental metadata generated within a specific time period ($24 \times N$ hours) before the task start time (T). Assume that you select T-1 and the task was executed at 14:50 on June 6, 2024. The system scans for incremental metadata generated from 14:50 on June 5, 2024 to 14:50 on June 6, 2024.
	MaxCompute Parameters (Optional)	The parameters are optional and usually left blank. If needed, you can configure the parameters by referring to MaxCompute Documentation .
Data Scope	By database	<p>Enter the names of databases to be scanned in the Include Databases text box. Click Add to add more entries. A maximum of 10 databases can be added.</p>  <p>If there are tables you do not want to migrate, download the template in CSV format, add information about these tables to the template, and upload the template to MgC. For details, see steps Step 5.2 to Step 5.5.</p>

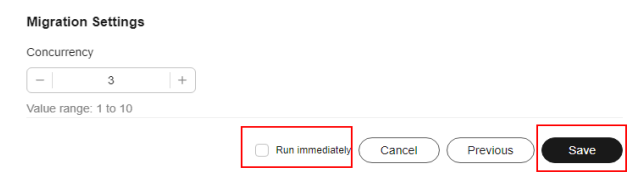
Area	Parameter	Configuration
	By table	<ol style="list-style-type: none"> Download the template in CSV format. Open the downloaded CSV template file with Notepad. <p>CAUTION Do not use Excel to edit the CSV template file. The template file edited and saved in Excel cannot be identified by MgC.</p> Retain the first line in the CSV template file. From the second line onwards, enter the information about tables to be migrated in the format of {MaxCompute project name}, {Table name}. <i>MaxCompute project name</i> refers to the name of the MaxCompute project to be migrated. <i>Table name</i> refers to the data table to be migrated. <p>NOTICE</p> <ul style="list-style-type: none"> Use commas (,) to separate the MaxCompute project name and the table name in each line. Do not use spaces or other separators. After adding the information about a table, press Enter to start a new line. After all table information is added, save the changes to the CSV file. Upload the edited and saved CSV file to MgC.
Target Settings	Target Connection	Select the DLI connection with a SQL queue created in Creating a Target Connection . <p>CAUTION Do not select the connection with a general queue configured.</p>
	Custom Parameters (Optional)	Configure the parameters as needed. For details, see Configuration parameter description and Custom Parameters .
Migration Settings	Concurrency	Set the number of concurrent migration subtasks. The default value is 3 . The value ranges from 1 to 10 .

Step 6 After the configuration is complete, execute the task.

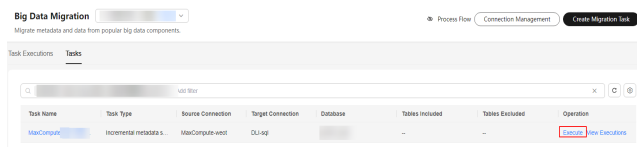
NOTICE

- A migration task can be executed repeatedly. Each time a migration task is executed, a task execution is generated.
- You can click the task name to modify the task configuration.

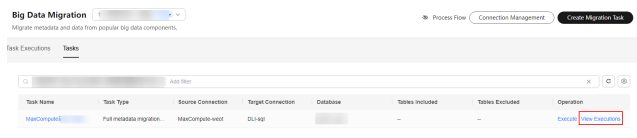
- You can select **Run immediately** and click **Save** to create the task and execute it immediately. You can view the created task on the **Tasks** page.



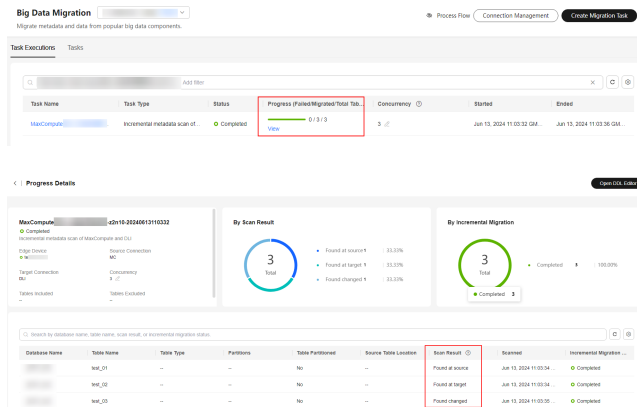
- You can also click **Save** to just create the task. You can view the created task on the **Tasks** page. To execute the task, click **Execute** in the **Operation** column.



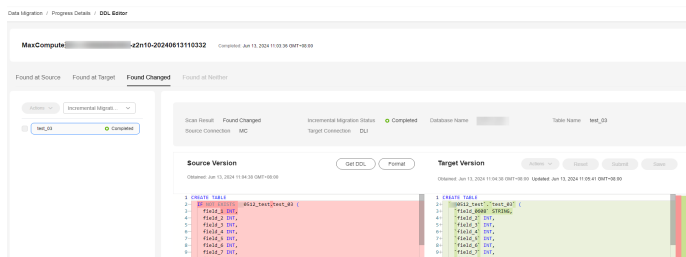
Step 7 After the migration task is executed, click **View Executions** in the **Operation** column. On the **Task Executions** tab, you can view the details of the running task execution and all historical executions.



Click **View** in the **Progress** column. On the displayed **Progress Details** page, **view and export the incremental metadata scan results**.



Step 8 In the upper right corner of the progress details page, click **Open DDL Editor** to compare and edit the structures of incremental tables.



----End

2.11.5.3 Migrating Full Data

Migrate all data from source databases to Huawei Cloud DLI.

Prerequisites

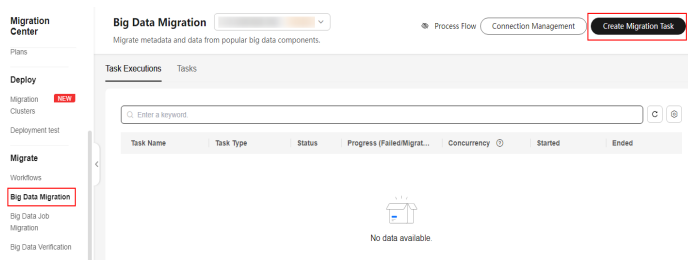
- You have completed all [preparations](#).
- [A source connection has been created](#).
- [Target connections have been created](#).
- You have been added to the whitelist that allows JAR programs to access DLI metadata. If you have not, contact technical support.

Procedure

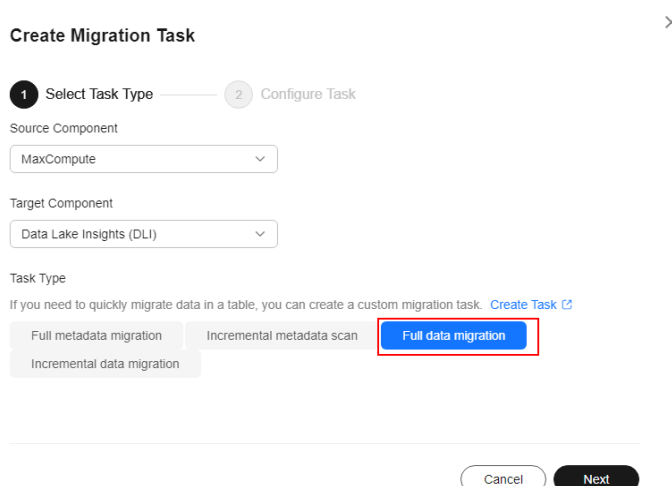
Step 1 Sign in to the [MgC console](#).

Step 2 In the navigation pane on the left, choose **Migrate > Big Data Migration**. In the upper left corner of the page, select the migration project created in [Preparations](#).

Step 3 In the upper right corner of the page, click **Create Migration Task**.

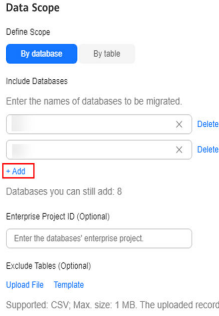


Step 4 Select **MaxCompute** for **Source Component**, **Data Lake Insight (DLI)** for **Target Component**, **Full data migration** for **Task Type**, and click **Next**.



Step 5 Configure parameters required for creating a full data migration task based on [Table 2-68](#).

Table 2-68 Parameters required for creating a full data migration task

Area	Parameter	Configuration
Basic Settings	Task Name	The default name is Full-data-migration-from-MaxCompute-to-DLI-4 random characters (including letters and numbers). You can also customize a name.
	Edge Device	Select the Edge device you connected to MgC in Making Preparations .
Source Settings	Source Connection	Select the source connection you created .
	Estimated Project Period (Day) (Optional)	If this parameter is set, the system checks table lifecycle during the migration. If the lifecycle of a table ends before the expected end time of the project, the table will be skipped. If this parameter is not set, all tables are migrated by default.
	MaxCompute Parameters (Optional)	The parameters are optional and usually left blank. If needed, you can configure the parameters by referring to MaxCompute Documentation .
Data Scope	By database	<p>Enter the names of databases to be migrated in the Include Databases text box. Click Add to add more entries. A maximum of 10 databases can be added.</p>  <p>If there are tables you do not want to migrate, download the template in CSV format, add information about these tables to the template, and upload the template to MgC. For details, see steps Step 5.2 to Step 5.5.</p>

Area	Parameter	Configuration
	By table	<ol style="list-style-type: none"> 1. Download the template in CSV format. 2. Open the downloaded CSV template file with Notepad. <p>CAUTION Do not use Excel to edit the CSV template file. The template file edited and saved in Excel cannot be identified by MgC.</p> 3. Retain the first line in the CSV template file. From the second line onwards, enter the information about tables to be migrated in the format of {MaxCompute project name}, {Table name}. <i>MaxCompute project name</i> refers to the name of the MaxCompute project to be migrated. <i>Table name</i> refers to the data table to be migrated. <p>NOTICE</p> <ul style="list-style-type: none"> - Use commas (,) to separate the MaxCompute project name and the table name in each line. Do not use spaces or other separators. - After adding the information about a table, press Enter to start a new line. 4. After all table information is added, save the changes to the CSV file. 5. Upload the edited and saved CSV file to MgC.
Target Settings	Target Connection	<p>Select the DLI connection with a general queue created in Creating a Target Connection.</p> <p>CAUTION Do not a DLI connection with a SQL queue configured.</p>

Area	Parameter	Configuration																																				
	Custom Parameters (Optional)	<p>Configure the parameters as needed. For details, see Configuration parameter description and Custom Parameters.</p> <ul style="list-style-type: none"> If the migration is performed over the Internet, set the following four parameters: <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p style="font-size: small; margin: 0;">Custom Parameters</p> <p style="font-size: x-small; margin: 0;">See custom parameters in the DLI documentation. View Documentation</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"><input type="text" value="spark.dli.metaAccess.enable"/></td> <td><input type="text" value="true"/></td> <td style="text-align: right; font-size: x-small;">✕</td> </tr> <tr> <td><input type="text" value="spark.dli.job.agency.name"/></td> <td><input type="text"/></td> <td style="text-align: right; font-size: x-small;">✕</td> </tr> <tr> <td><input type="text" value="mgc.mc2dli.data.migration.dli.file.path"/></td> <td><input type="text" value="obs://mgc-test/data/migration-dli-spark-1.0.0.jar"/></td> <td style="text-align: right; font-size: x-small;">✕</td> </tr> <tr> <td><input type="text" value="mgc.mc2dli.data.migration.dli.spark.jars"/></td> <td><input "="" type="text" value='["obs://mgc-test/data/datasource.jar","obs://mgc-test/data/fastjson-1.2.54.jar"]'/></td> <td style="text-align: right; font-size: x-small;">✕</td> </tr> </table> <p style="font-size: x-small; margin: 0; text-align: left;">Add</p> </div> <ul style="list-style-type: none"> – spark.dli.metaAccess.enable: Enter true. – spark.dli.job.agency.name: Enter the name of the DLI agency you configured. – mgc.mc2dli.data.migration.dli.file.path: Enter the OBS path for storing the migration-dli-spark-1.0.0.jar package. For example, <code>obs://mgc-test/data/migration-dli-spark-1.0.0.jar</code> – mgc.mc2dli.data.migration.dli.spark.jars: Enter the OBS path for storing the fastjson-1.2.54.jar and datasource.jar packages. The value is transferred in array format. Package names must be enclosed using double quotation marks and be separated with commas (,) For example: <code>["obs://mgc-test/data/datasource.jar","obs://mgc-test/data/fastjson-1.2.54.jar"]</code> If the migration is performed over a private network, set the following four parameters: <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p style="font-size: small; margin: 0;">Custom Parameters</p> <p style="font-size: x-small; margin: 0;">See custom parameters in the DLI documentation. View Documentation</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"><input type="text" value="spark.dli.metaAccess.enable"/></td> <td><input type="text" value="true"/></td> <td style="text-align: right; font-size: x-small;">✕</td> </tr> <tr> <td><input type="text" value="spark.dli.job.agency.name"/></td> <td><input type="text"/></td> <td style="text-align: right; font-size: x-small;">✕</td> </tr> <tr> <td><input type="text" value="mgc.mc2dli.data.migration.dli.file.path"/></td> <td><input type="text" value="obs://mgc-test/data/migration-dli-spark-1.0.0.jar"/></td> <td style="text-align: right; font-size: x-small;">✕</td> </tr> <tr> <td><input type="text" value="mgc.mc2dli.data.migration.dli.spark.jars"/></td> <td><input "="" type="text" value='["obs://mgc-test/data/datasource.jar","obs://mgc-test/data/fastjson-1.2.54.jar"]'/></td> <td style="text-align: right; font-size: x-small;">✕</td> </tr> <tr> <td><input type="text" value="spark.sql.catalog.mc_catalog.tableWrite"/></td> <td><input type="text" value="tunnel"/></td> <td style="text-align: right; font-size: x-small;">✕</td> </tr> <tr> <td><input type="text" value="spark.sql.catalog.mc_catalog.tableReac"/></td> <td><input type="text" value="tunnel"/></td> <td style="text-align: right; font-size: x-small;">✕</td> </tr> <tr> <td><input type="text" value="spark.hadoop.odps.end.point"/></td> <td><input type="text" value="http://service-1-maxcompute"/></td> <td style="text-align: right; font-size: x-small;">✕</td> </tr> <tr> <td><input type="text" value="spark.hadoop.odps.tunnel.end.point"/></td> <td><input type="text" value="http://dt-maxcompute.ally"/></td> <td style="text-align: right; font-size: x-small;">✕</td> </tr> </table> <p style="font-size: x-small; margin: 0; text-align: left;">Add</p> </div> <ul style="list-style-type: none"> – spark.dli.metaAccess.enable: Enter true. – spark.dli.job.agency.name: Enter the name of the DLI agency you configured. 	<input type="text" value="spark.dli.metaAccess.enable"/>	<input type="text" value="true"/>	✕	<input type="text" value="spark.dli.job.agency.name"/>	<input type="text"/>	✕	<input type="text" value="mgc.mc2dli.data.migration.dli.file.path"/>	<input type="text" value="obs://mgc-test/data/migration-dli-spark-1.0.0.jar"/>	✕	<input type="text" value="mgc.mc2dli.data.migration.dli.spark.jars"/>	<input "="" type="text" value='["obs://mgc-test/data/datasource.jar","obs://mgc-test/data/fastjson-1.2.54.jar"]'/>	✕	<input type="text" value="spark.dli.metaAccess.enable"/>	<input type="text" value="true"/>	✕	<input type="text" value="spark.dli.job.agency.name"/>	<input type="text"/>	✕	<input type="text" value="mgc.mc2dli.data.migration.dli.file.path"/>	<input type="text" value="obs://mgc-test/data/migration-dli-spark-1.0.0.jar"/>	✕	<input type="text" value="mgc.mc2dli.data.migration.dli.spark.jars"/>	<input "="" type="text" value='["obs://mgc-test/data/datasource.jar","obs://mgc-test/data/fastjson-1.2.54.jar"]'/>	✕	<input type="text" value="spark.sql.catalog.mc_catalog.tableWrite"/>	<input type="text" value="tunnel"/>	✕	<input type="text" value="spark.sql.catalog.mc_catalog.tableReac"/>	<input type="text" value="tunnel"/>	✕	<input type="text" value="spark.hadoop.odps.end.point"/>	<input type="text" value="http://service-1-maxcompute"/>	✕	<input type="text" value="spark.hadoop.odps.tunnel.end.point"/>	<input type="text" value="http://dt-maxcompute.ally"/>	✕
<input type="text" value="spark.dli.metaAccess.enable"/>	<input type="text" value="true"/>	✕																																				
<input type="text" value="spark.dli.job.agency.name"/>	<input type="text"/>	✕																																				
<input type="text" value="mgc.mc2dli.data.migration.dli.file.path"/>	<input type="text" value="obs://mgc-test/data/migration-dli-spark-1.0.0.jar"/>	✕																																				
<input type="text" value="mgc.mc2dli.data.migration.dli.spark.jars"/>	<input "="" type="text" value='["obs://mgc-test/data/datasource.jar","obs://mgc-test/data/fastjson-1.2.54.jar"]'/>	✕																																				
<input type="text" value="spark.dli.metaAccess.enable"/>	<input type="text" value="true"/>	✕																																				
<input type="text" value="spark.dli.job.agency.name"/>	<input type="text"/>	✕																																				
<input type="text" value="mgc.mc2dli.data.migration.dli.file.path"/>	<input type="text" value="obs://mgc-test/data/migration-dli-spark-1.0.0.jar"/>	✕																																				
<input type="text" value="mgc.mc2dli.data.migration.dli.spark.jars"/>	<input "="" type="text" value='["obs://mgc-test/data/datasource.jar","obs://mgc-test/data/fastjson-1.2.54.jar"]'/>	✕																																				
<input type="text" value="spark.sql.catalog.mc_catalog.tableWrite"/>	<input type="text" value="tunnel"/>	✕																																				
<input type="text" value="spark.sql.catalog.mc_catalog.tableReac"/>	<input type="text" value="tunnel"/>	✕																																				
<input type="text" value="spark.hadoop.odps.end.point"/>	<input type="text" value="http://service-1-maxcompute"/>	✕																																				
<input type="text" value="spark.hadoop.odps.tunnel.end.point"/>	<input type="text" value="http://dt-maxcompute.ally"/>	✕																																				

Area	Parameter	Configuration
		<ul style="list-style-type: none"> - mgc.mc2dli.data.migration.dli.file.path: Enter the OBS path for storing the migration-dli-spark-1.0.0.jar package. For example, obs://mgc-test/data/migration-dli-spark-1.0.0.jar - mgc.mc2dli.data.migration.dli.spark.jars: Enter the OBS path for storing the fastjson-1.2.54.jar and datasource.jar packages. The value is transferred in array format. Package names must be enclosed using double quotation marks and be separated with commas (,) For example: ["obs://mgc-test/data/datasource.jar","obs://mgc-test/data/fastjson-1.2.54.jar"] - spark.sql.catalog.mc_catalog.tableWriteProvider: Enter tunnel. - spark.sql.catalog.mc_catalog.tableReadProvider: Enter tunnel. - spark.hadoop.odps.end.point: Enter the VPC endpoint of the region where the source MaxCompute service is provisioned. For details about the MaxCompute VPC endpoint in each region, see Endpoints in different regions (VPC). For example, if the source MaxCompute service is located in Hong Kong, China, enter http://service.cn-hongkong.maxcompute.aliyun-inc.com/api. - spark.hadoop.odps.tunnel.end.point: Enter the VPC Tunnel endpoint of the region where the source MaxCompute service is located. For details about the MaxCompute VPC Tunnel endpoint in each region, see Endpoints in different regions (VPC). For example, if the source MaxCompute service is located in Hong Kong, China, enter http://dt.cn-hongkong.maxcompute.aliyun-inc.com.
Migration Settings	Large Table Migration Rules	Control how large a table will be split into multiple migration subtasks. You are advised to retain the default settings. You can also change the settings as needed.

Area	Parameter	Configuration
	Small Table Migration Rules	Control how small a table will be merged into one migration subtask along with other small tables. This can accelerate your migration. You are advised to retain the default settings. You can also change the settings as needed.
	Concurrency	Set the number of concurrent migration subtasks. The default value is 3 . The value ranges from 1 to 10 .
	Max. SQL Statements Per File	SQL statements are generated for running migration commands. The number you set here limits how many SQL statements can be stored in a single file. The default value is 3 . The value ranges from 1 to 50 .

Step 6 After the configuration is complete, execute the task.

NOTICE

- A migration task can be executed repeatedly. Each time a migration task is executed, a task execution is generated.
- You can click the task name to modify the task configuration.

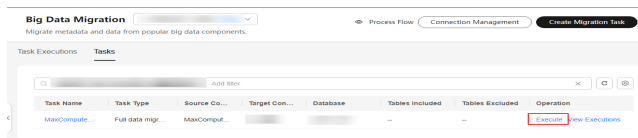
- You can select **Run immediately** and click **Save** to create the task and execute it immediately. You can view the created task on the **Tasks** page.

Concurrency
 - +
 Value range: 1 to 10

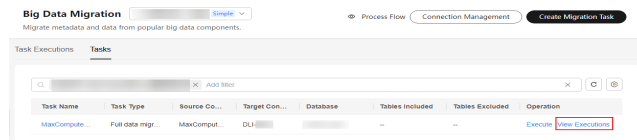
Max. SQL Statements Per File
 - +
 SQL statements are generated for running migration commands. The number you set here limits how many SQL statements can be stored in a single file. Value range: 1 to 50

Run immediately Cancel Previous **Save**

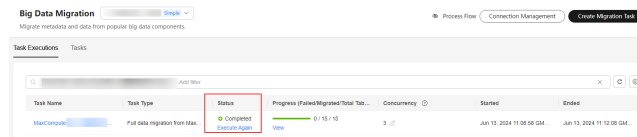
- You can also click **Save** to just create the task. You can view the created task on the **Tasks** page. To execute the task, click **Execute** in the **Operation** column.



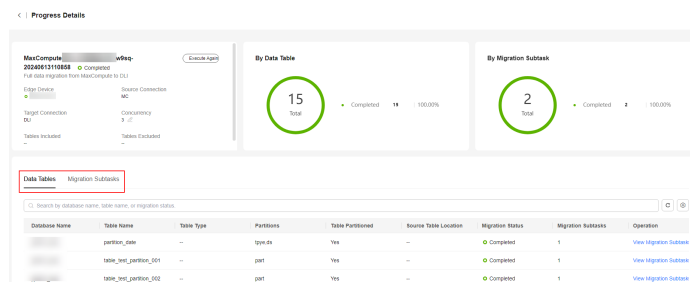
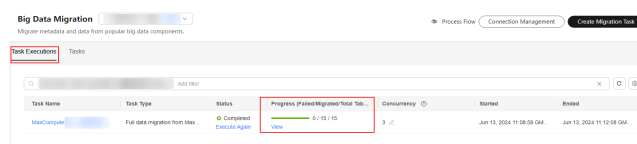
Step 7 After the migration task is executed, click **View Executions** in the **Operation** column. On the **Task Executions** tab, you can view the details of the running task execution and all historical executions.



Click **Execute Again** in the **Status** column to run the execution again.



Click **View** in the **Progress** column. On the displayed **Progress Details** page, **view and export the task execution results**.



Step 8 (Optional) After the data migration is complete, verify data consistency between the source and the target databases. For details, see [Verifying the Consistency of Data Migrated from MaxCompute to DLI](#).

----End

2.11.5.4 Migrating Incremental Data

Synchronize data that has been added, modified, or deleted after the previous migration is complete from source databases to Huawei Cloud DLI.

Prerequisites

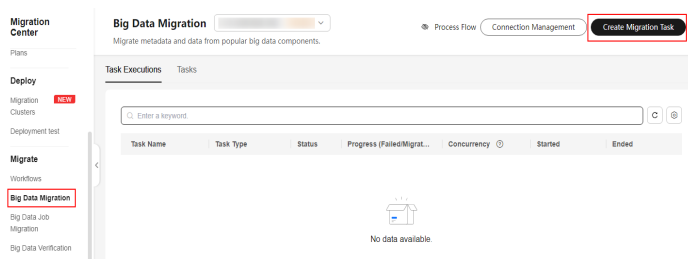
- You have completed all [preparations](#).
- [A source connection has been created](#).
- [Target connections have been created](#).
- At least one [full data migration](#) has been completed.
- You have been added to the whitelist that allows JAR programs to access DLI metadata. If you have not, contact technical support.

Procedure

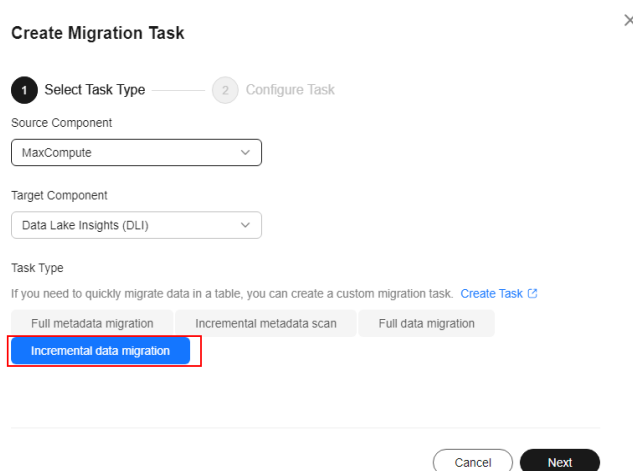
Step 1 Sign in to the [MgC console](#).

Step 2 In the navigation pane on the left, choose **Migrate > Big Data Migration**. In the upper left corner of the page, select the migration project created in **Preparations**.

Step 3 In the upper right corner of the page, click **Create Migration Task**.



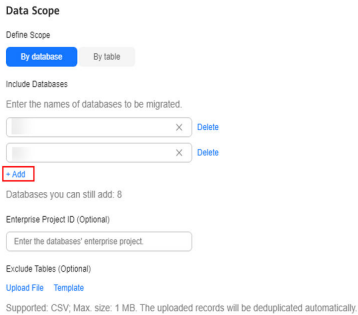
Step 4 Select **MaxCompute** for **Source Component**, **Data Lake Insight (DLI)** for **Target Component**, **Incremental data migration** for **Task Type**, and click **Next**.



Step 5 Configure parameters required for creating an incremental data migration task based on **Table 2-69**.

Table 2-69 Parameters required for creating an incremental data migration task

Area	Parameter	Configuration
Basic Settings	Task Name	The default name is Incremental-data-migration-from-MaxCompute-to-DLI-4 random characters (including letters and numbers). You can also customize a name.
	Edge Device	Select the Edge device you connected to MgC in Preparations .
Source Settings	Source Connection	Select the source connection you created .

Area	Parameter	Configuration
	Time Range	<p>Select a T-N option to limit the migration to the incremental data generated within a specific time period (24 × N hours) before the task start time (T). Assume that you select T-1 and the task was executed at 14:50 on June 6, 2024. The system migrates incremental data generated from 14:50 on June 5, 2024 to 14:50 on June 6, 2024.</p> <p>If you select Specified Date, only incremental data generated on the specified date is migrated.</p>
	Filter Partitions	<p>Decide whether to filter partitions to be migrated by update time or creation time. The default value is By update time.</p> <p>Select By update time to migrate the data that was changed in the specified period.</p> <p>Select By creation time to migrate the data that was created in a specified period.</p>
	MaxCompute Parameters (Optional)	<p>The parameters are optional and usually left blank. If needed, you can configure the parameters by referring to MaxCompute Documentation.</p>
Data Scope	By database	<p>Enter the names of databases where incremental data needs to be migrated in the Include Databases text box. Click Add to add more entries. A maximum of 10 databases can be added.</p>  <p>If there are tables you do not want to migrate, download the template in CSV format, add information about these tables to the template, and upload the template to MgC. For details, see steps Step 5.2 to Step 5.5.</p>

Area	Parameter	Configuration
	By table	<ol style="list-style-type: none"> 1. Download the template in CSV format. 2. Open the downloaded CSV template file with Notepad. <p>CAUTION Do not use Excel to edit the CSV template file. The template file edited and saved in Excel cannot be identified by MgC.</p> <ol style="list-style-type: none"> 3. Retain the first line in the CSV template file. From the second line onwards, enter the information about tables to be migrated in the format of {MaxCompute project name}, {Table name}. <i>MaxCompute project name</i> refers to the name of the MaxCompute project to be migrated. <i>Table name</i> refers to the data table to be migrated. <p>NOTICE</p> <ul style="list-style-type: none"> - Use commas (,) to separate the MaxCompute project name and the table name in each line. Do not use spaces or other separators. - After adding the information about a table, press Enter to start a new line. <ol style="list-style-type: none"> 4. After all table information is added, save the changes to the CSV file. 5. Upload the edited and saved CSV file to MgC.
Target Settings	Target Connection	<p>Select the DLI connection with a general queue created in Creating a Target Connection.</p> <p>CAUTION Do not a DLI connection with a SQL queue configured.</p>

Area	Parameter	Configuration																																				
	Custom Parameters (Optional)	<p>Configure the parameters as needed. For details, see Configuration parameter description and Custom Parameters.</p> <ul style="list-style-type: none"> If the migration is performed over the Internet, set the following four parameters: <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p style="font-size: 0.8em; margin: 0;">Custom Parameters</p> <p style="font-size: 0.8em; margin: 0;">See custom parameters in the DLI documentation. View Documentation</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; border: 1px solid #ccc; padding: 2px;">spark.dli.metaAccess.enable</td> <td style="border: 1px solid #ccc; padding: 2px;">true</td> <td style="text-align: right; font-size: 0.8em;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">spark.dli.job.agency.name</td> <td style="border: 1px solid #ccc; padding: 2px;"></td> <td style="text-align: right; font-size: 0.8em;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">mgc.mc2dli.data.migration.dli.file.path</td> <td style="border: 1px solid #ccc; padding: 2px;">obs / spark-</td> <td style="text-align: right; font-size: 0.8em;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">mgc.mc2dli.data.migration.dli.spark.jars</td> <td style="border: 1px solid #ccc; padding: 2px;">["obs://", "oi"]</td> <td style="text-align: right; font-size: 0.8em;">✕</td> </tr> </table> <p style="font-size: 0.8em; margin: 0; color: #007bff;">Add</p> </div> <ul style="list-style-type: none"> – spark.dli.metaAccess.enable: Enter true. – spark.dli.job.agency.name: Enter the name of the DLI agency you configured. – mgc.mc2dli.data.migration.dli.file.path: Enter the OBS path for storing the migration-dli-spark-1.0.0.jar package. For example, <code>obs://mgc-test/data/migration-dli-spark-1.0.0.jar</code> – mgc.mc2dli.data.migration.dli.spark.jars: Enter the OBS path for storing the fastjson-1.2.54.jar and datasource.jar packages. The value is transferred in array format. Package names must be enclosed using double quotation marks and be separated with commas (,) For example: <code>["obs://mgc-test/data/datasource.jar", "obs://mgc-test/data/fastjson-1.2.54.jar"]</code> If the migration is performed over a private network, set the following four parameters: <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p style="font-size: 0.8em; margin: 0;">Custom Parameters</p> <p style="font-size: 0.8em; margin: 0;">See custom parameters in the DLI documentation. View Documentation</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; border: 1px solid #ccc; padding: 2px;">spark.dli.metaAccess.enable</td> <td style="border: 1px solid #ccc; padding: 2px;">true</td> <td style="text-align: right; font-size: 0.8em;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">spark.dli.job.agency.name</td> <td style="border: 1px solid #ccc; padding: 2px;"></td> <td style="text-align: right; font-size: 0.8em;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">mgc.mc2dli.data.migration.dli.file.path</td> <td style="border: 1px solid #ccc; padding: 2px;">obs://mgc-test/data/migration-dli-spark-</td> <td style="text-align: right; font-size: 0.8em;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">mgc.mc2dli.data.migration.dli.spark.jars</td> <td style="border: 1px solid #ccc; padding: 2px;">["obs://mgc-test/data/datasource.jar", "oi"]</td> <td style="text-align: right; font-size: 0.8em;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">spark.sql.catalog.mc_catalog.tableWrite</td> <td style="border: 1px solid #ccc; padding: 2px;">tunnel</td> <td style="text-align: right; font-size: 0.8em;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">spark.sql.catalog.mc_catalog.tableReac</td> <td style="border: 1px solid #ccc; padding: 2px;">tunnel</td> <td style="text-align: right; font-size: 0.8em;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">spark.hadoop.odps.end.point</td> <td style="border: 1px solid #ccc; padding: 2px;">*http://service. maxcomput</td> <td style="text-align: right; font-size: 0.8em;">✕</td> </tr> <tr> <td style="border: 1px solid #ccc; padding: 2px;">spark.hadoop.odps.tunnel.end.point</td> <td style="border: 1px solid #ccc; padding: 2px;">*http://dt. maxcompute.ally</td> <td style="text-align: right; font-size: 0.8em;">✕</td> </tr> </table> <p style="font-size: 0.8em; margin: 0; color: #007bff;">Add</p> </div> <ul style="list-style-type: none"> – spark.dli.metaAccess.enable: Enter true. – spark.dli.job.agency.name: Enter the name of the DLI agency you configured. 	spark.dli.metaAccess.enable	true	✕	spark.dli.job.agency.name		✕	mgc.mc2dli.data.migration.dli.file.path	obs / spark-	✕	mgc.mc2dli.data.migration.dli.spark.jars	["obs://", "oi"]	✕	spark.dli.metaAccess.enable	true	✕	spark.dli.job.agency.name		✕	mgc.mc2dli.data.migration.dli.file.path	obs://mgc-test/data/migration-dli-spark-	✕	mgc.mc2dli.data.migration.dli.spark.jars	["obs://mgc-test/data/datasource.jar", "oi"]	✕	spark.sql.catalog.mc_catalog.tableWrite	tunnel	✕	spark.sql.catalog.mc_catalog.tableReac	tunnel	✕	spark.hadoop.odps.end.point	*http://service. maxcomput	✕	spark.hadoop.odps.tunnel.end.point	*http://dt. maxcompute.ally	✕
spark.dli.metaAccess.enable	true	✕																																				
spark.dli.job.agency.name		✕																																				
mgc.mc2dli.data.migration.dli.file.path	obs / spark-	✕																																				
mgc.mc2dli.data.migration.dli.spark.jars	["obs://", "oi"]	✕																																				
spark.dli.metaAccess.enable	true	✕																																				
spark.dli.job.agency.name		✕																																				
mgc.mc2dli.data.migration.dli.file.path	obs://mgc-test/data/migration-dli-spark-	✕																																				
mgc.mc2dli.data.migration.dli.spark.jars	["obs://mgc-test/data/datasource.jar", "oi"]	✕																																				
spark.sql.catalog.mc_catalog.tableWrite	tunnel	✕																																				
spark.sql.catalog.mc_catalog.tableReac	tunnel	✕																																				
spark.hadoop.odps.end.point	*http://service. maxcomput	✕																																				
spark.hadoop.odps.tunnel.end.point	*http://dt. maxcompute.ally	✕																																				

Area	Parameter	Configuration
		<ul style="list-style-type: none"> - mgc.mc2dli.data.migration.dli.file.path: Enter the OBS path for storing the migration-dli-spark-1.0.0.jar package. For example, obs://mgc-test/data/migration-dli-spark-1.0.0.jar - mgc.mc2dli.data.migration.dli.spark.jars: Enter the OBS path for storing the fastjson-1.2.54.jar and datasource.jar packages. The value is transferred in array format. Package names must be enclosed using double quotation marks and be separated with commas (,) For example: ["obs://mgc-test/data/datasource.jar","obs://mgc-test/data/fastjson-1.2.54.jar"] - spark.sql.catalog.mc_catalog.tableWrite Provider: Enter tunnel. - spark.sql.catalog.mc_catalog.tableRead Provider: Enter tunnel. - spark.hadoop.odps.end.point: Enter the VPC endpoint of the region where the source MaxCompute service is provisioned. For details about the MaxCompute VPC endpoint in each region, see Endpoints in different regions (VPC). For example, if the source MaxCompute service is located in Hong Kong, China, enter http://service.cn-hongkong.maxcompute.aliyun-inc.com/api. - spark.hadoop.odps.tunnel.end.point: Enter the VPC Tunnel endpoint of the region where the source MaxCompute service is located. For details about the MaxCompute VPC Tunnel endpoint in each region, see Endpoints in different regions (VPC). For example, if the source MaxCompute service is located in Hong Kong, China, enter http://dt.cn-hongkong.maxcompute.aliyun-inc.com.
Migration Settings	Large Table Migration Rules	Control how large a table will be split into multiple migration subtasks. You are advised to retain the default settings. You can also change the settings as needed.

Area	Parameter	Configuration
	Small Table Migration Rules	Control how small a table will be merged into one migration subtask along with other small tables. This can accelerate your migration. You are advised to retain the default settings. You can also change the settings as needed.
	Concurrency	Set the number of concurrent migration subtasks. The default value is 3 . The value ranges from 1 to 10 .
	Max. SQL Statements Per File	SQL statements are generated for running migration commands. The number you set here limits how many SQL statements can be stored in a single file. The default value is 3 . The value ranges from 1 to 50 .

Step 6 After the configuration is complete, execute the task.

NOTICE

- A migration task can be executed repeatedly. Each time a migration task is executed, a task execution is generated.
- You can click the task name to modify the task configuration.

- You can select **Run immediately** and click **Save** to create the task and execute it immediately. You can view the created task on the **Tasks** page.

Concurrency
- 3 +
Value range: 1 to 10

Max. SQL Statements Per File
- 10 +
SQL statements are generated for running migration commands. The number you set here limits how many SQL statements can be stored in a single file. Value range: 1 to 50

Run immediately Cancel Previous Save

- You can also click **Save** to just create the task. You can view the created task on the **Tasks** page. To execute the task, click **Execute** in the **Operation** column.

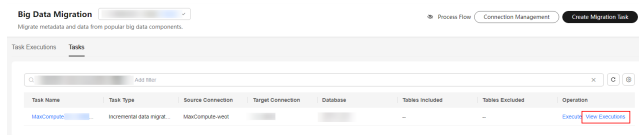
Big Data Migration

Process Flow Connection Management Create Migration Task

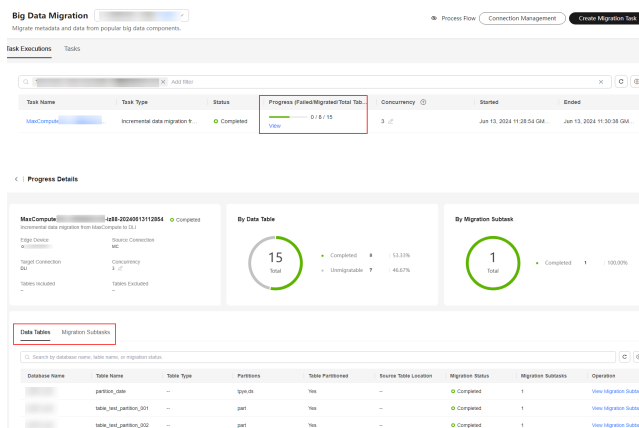
Task Executions Tasks

Task Name	Task Type	Source Connection	Target Connection	Database	Tables Included	Tables Excluded	Operation
MacComputer	Incremental data migrat.	MacComputer-est	Du				View Executions

Step 7 After the migration task is executed, click **View Executions** in the **Operation** column. On the **Task Executions** tab, you can view the details of the running task execution and all historical executions.



Locate the running execution and click **View** in the **Progress** column. On the displayed **Progress Details** page, **view and export the task execution results**.



Step 8 (Optional) After the data migration is complete, verify data consistency between the source and the target databases. For details, see [Verifying the Consistency of Data Migrated from MaxCompute to DLI](#).

----End

2.11.6 Viewing and Exporting Task Execution Results

Each time a migration task is executed, a task execution is generated. On the task execution details page, you can view and export the task execution results.

NOTICE

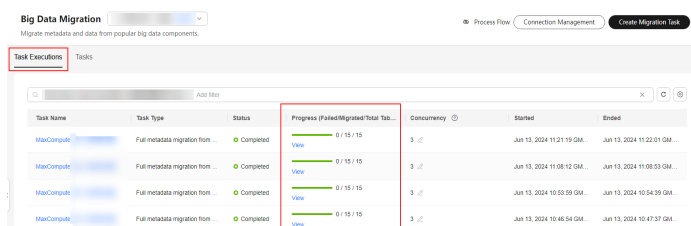
The exported files can be downloaded within 15 days of when they are generated but will be automatically deleted after that.

Prerequisites

A migration task has been created and executed.

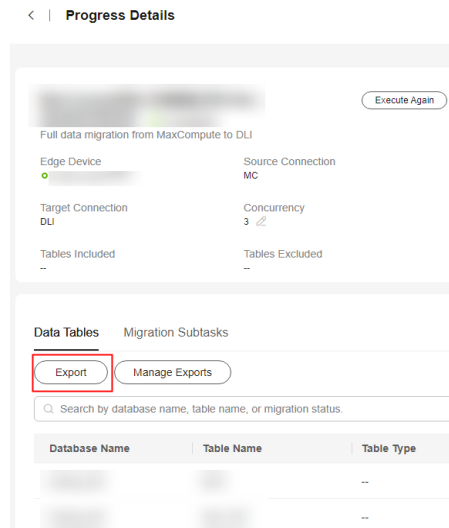
Procedure

Step 1 In the **Task Executions** page, locate a task execution and click **View** in the **Progress** column.



- Step 2** Under **Tables**, click **Export**. The system starts to export the task execution results. You can filter the task execution results and export only the filtered results.

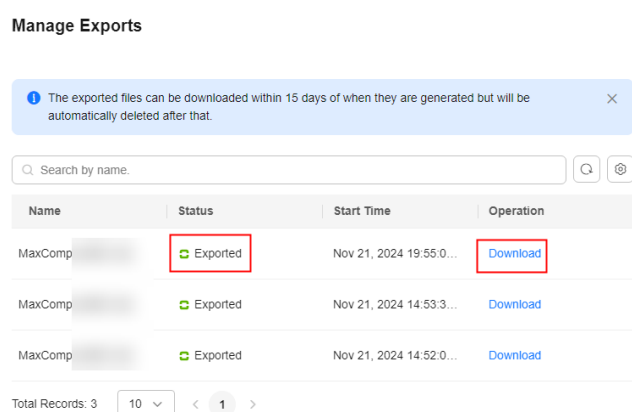
Figure 2-36 Exporting execution results



- Step 3** After the export is complete, click **Manage Exports**.

- Step 4** After the export is complete, click **Download** in the **Operation** column to download the exported results.

Figure 2-37 Downloading exported results



----End

2.11.7 Custom Parameters

For details about the custom parameters that can be configured for the target, see [Table 2-70](#) and [configuration parameter description](#).

Table 2-70 Supported custom parameters

Parameter	Value Range	Description	Mandatory
spark.dli.metaAccess.enable	-	Enter true .	Yes
spark.dli.job.agency.name		Enter the DLI agency name .	
mgc.mc2dli.data.migration.dli.file.path		Enter the OBS path for storing the migration-dli-spark-1.0.0.jar package . For example, obs://mgc-test/data/migration-dli-spark-1.0.0.jar	
mgc.mc2dli.data.migration.dli.spark.jars		Enter the OBS path for storing the fastjson-1.2.54.jar and datasource.jar packages . The value is transferred in array format. Package names must be enclosed using double quotation marks and be separated with commas (,) For example: ["obs://mgc-test/data/datasource.jar","obs://mgc-test/data/fastjson-1.2.54.jar"]	
spark.sql.catalog.mc_catalog.tableWriteProvider		Enter tunnel .	Mandatory for migration over private lines
spark.sql.catalog.mc_catalog.tableReadProvider		Enter tunnel .	
spark.hadoop.odps.endpoint		Enter the VPC endpoint of the region where the source MaxCompute service is provisioned. For details about the MaxCompute VPC endpoint in each region, see Endpoints in different regions (VPC) . For example, if the source MaxCompute service is located in Hong Kong, China, enter http://service.cn-hongkong.maxcompute.aliyun-inc.com/api .	

Parameter	Value Range	Description	Mandatory
spark.hadoop.odps.tunnel.endpoint		Enter the VPC Tunnel endpoint of the region where the source MaxCompute service is located. For details about the MaxCompute VPC Tunnel endpoint in each region, see Endpoints in different regions (VPC) . For example, if the source MaxCompute service is located in Hong Kong, China, enter http://dt.cn-hongkong.maxcompute.aliyun-inc.com .	
spark.hadoop.odps.tunnel.quota.name	-	Enter the quota name used for accessing MaxCompute.	No
sc_type	A, B, and C	<p>Compute resource type. Currently, resource types A, B, and C are available. If this parameter is not specified, the minimum configuration (type A) is used.</p> <ul style="list-style-type: none"> • A: (vCPUs: 8; memory: 32 GB; driverCores: 2; executorCores: 1; driverMemory: 7 GB; executorMemory: 4 GB; and numExecutor: 6) • B: (vCPUs: 16; memory: 64 GB; driverCores: 2; executorCores: 2; driverMemory: 7 GB; executorMemory: 8 GB; and numExecutor: 7) • C: (vCPUs: 32; memory: 128 GB; driverCores: 4; executorCores: 2; driverMemory: 15 GB; executorMemory: 8 GB; and numExecutor: 14) 	No
executorCores	1- 4	Number of CPU cores of each Executor in the Spark application. This configuration will replace the default setting in sc_type .	
numExecutors	1-100	Number of Executors in a Spark application. This configuration will replace the default setting in sc_type .	
executorMemory	1-16 G	Executor memory of the Spark application, for example, 2 GB or 2048 MB . This configuration will replace the default setting in sc_type . The unit must be provided. Otherwise, the startup fails.	
driverCores	1-4	Number of CPU cores of the Spark application driver. This configuration will replace the default setting in sc_type .	

Parameter	Value Range	Description	Mandatory
driverMemory	1-16 G	Driver memory of the Spark application, for example, 2 GB or 2048 MB . This configuration will replace the default setting in sc_type . The unit must be provided. Otherwise, the startup fails.	

2.12 Big Data Verification

2.12.1 Overview

MgC allows you to verify the consistency of data migrated from various big data computing and storage engines, such as Hive, HBase, Doris, and MaxCompute. Consistency verification ensures data accuracy and reliability and enables you to migrate big data to Huawei Cloud with confidence.

Verification Methods

- **Full verification:** The consistency of all inventory data is verified.
- **Daily incremental verification:** The consistency of incremental data is verified based on the creation or update time. You can choose to verify incremental data for one day or several consecutive days.
- **Hourly incremental verification:** Data consistency is verified based on the creation time or update time multiple times within 24 hours. The verification automatically stops at 00:00 on the next day.
- **Date-based verification:** This method applies only to tables partitioned by date in the year, month, and day format. You can choose to verify consistency of such tables for one day or several consecutive days. Tables that are not partitioned by date are not verified.
- **Selective verification:** This method can be used to verify the consistency of the data within a specified time period. You can only select a period going backward from the current time for verification.

Supported Source and Target Components

Source Component	Target Component
<ul style="list-style-type: none"> • Hive • HBase • Doris • MaxCompute • ClickHouse • Delta Lake • Hudi 	<ul style="list-style-type: none"> • Hive • DLI • MRS (Doris) • MRS (HBase) • MRS (ClickHouse) • CloudTable (ClickHouse) • CloudTable (HBase) • Delta • Hudi

Verification Methods Available for Each Component

Component	Verification Method
Hive	<ul style="list-style-type: none"> • Full verification
DLI	<ul style="list-style-type: none"> • Daily incremental verification • Hourly incremental verification • Date-based verification
MaxCompute	<ul style="list-style-type: none"> • Full verification • Daily incremental verification • Hourly incremental verification • Date-based verification • Sample partition verification
Doris	<ul style="list-style-type: none"> • Full verification • Daily incremental verification • Hourly incremental verification
HBase	<ul style="list-style-type: none"> • Full verification • Selective verification
ClickHouse	Full verification
ApsaraDB for ClickHouse	Full verification
CloudTable (HBase)	<ul style="list-style-type: none"> • Full verification • Selective verification
CloudTable (ClickHouse)	Full verification

Component	Verification Method
Delta	<ul style="list-style-type: none">• Full verification• Daily incremental verification• Hourly incremental verification• Date-based verification
Hudi	<ul style="list-style-type: none">• Full verification• Daily incremental verification• Hourly incremental verification• Date-based verification

2.12.2 Preparations

Before using big data verification, complete the following preparations:

Creating a Migration Project

Migration projects allow you to group, isolate, and manage migration resources. For details, see [Managing Migration Projects](#).

Preparing Edge

To verify big data consistency, you need to install Edge for Linux in your source environment. For details, see [Installing Edge for Linux](#). After Edge is installed, connect Edge to MgC. For details, see [Connecting the Edge Device to MgC](#).

CAUTION

Edge does not support automatic restart. Do not restart Edge during task execution, or tasks will fail.

Enabling Big Data Verification

- Step 1** Sign in to the [MgC](#) console.
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**. In the upper left corner of the page, choose the [migration project you created](#) from the project drop-down list
- Step 3** Click **Select Edge Device**.
- Step 4** In the displayed dialog box, select the Edge device you connected to MgC from the drop-down list.
 - If an Edge device is **Online** and **Enabled**, the device has been used for big data verification in a project. You can click **Confirm** to continue using the tool.

- If an Edge device is **Online** and **Disabled**, the device has not been used for big data verification in any project, and you can click **Enable** to use this device for big data verification.
- If an Edge device is **Offline** and **Deleted**, the device has been deleted, and it cannot be used for big data verification. However, if this device has been used for big data verification before being deleted, you can select it and click **View** to view the verification tasks and results.
- If an Edge device is **Offline** and **Disabled**, the device cannot be used for big data verification, and all operation buttons are disabled even if you select it and click **View**.

 **CAUTION**

Before performing big data verification, ensure that the selected Edge device is **Online** and **Enabled**.

----End

2.12.3 Creating a Connection to the Source

2.12.3.1 Creating a Connection to a Source Cloud Service

To verify the consistency of data stored using big data cloud services, you need to establish connections between MgC and the source and target cloud services.

The supported source big data cloud services include:

- MaxCompute
- ApsaraDB for ClickHouse

Procedure

- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**. Select the created [migration project](#) in the upper left corner of the page.
- Step 3** In the **Features** area, click **Connection Management**.
- Step 4** Click **Create Connection** in the upper right corner of the page.
- Step 5** Select the big data cloud service you use and click **Next**.
- Step 6** Configure the connection parameters based on the big data cloud service you selected.
 - [Parameters for creating a connection to MaxCompute](#)
 - [Parameters for creating a connection to ApsaraDB for ClickHouse](#)

Table 2-71 Parameters for creating a connection to MaxCompute

Parameter	Configuration
Connection To	Select Source .
Connection Name	The default name is MaxCompute-4 random characters (including letters and numbers). You can also customize a name.
Alibaba Cloud Credential	Select the credential of the source Alibaba Cloud account. For details about how to add credentials, see "Big data - MaxCompute" in Adding Resource Credentials .
MaxCompute Project	Enter the name of your MaxCompute project. You can obtain the project name from the MaxCompute console.
Endpoint	Enter the endpoint of the region where the MaxCompute project is located. For details about MaxCompute endpoints in different regions, see MaxCompute Endpoints .

Table 2-72 Parameters for creating a connection to ApsaraDB for ClickHouse

Parameter	Configuration
Connection To	Select Source .
Connection Name	The default name is ApsaraDB for ClickHouse-4 random characters (including letters and numbers). You can also customize a name.
ClickHouse Credential	Select the ApsaraDB for ClickHouse credential added to Edge. For details about how to add credentials, see "Big data - ClickHouse" in Adding Resource Credentials .
Database URL	Enter the public address of the source ClickHouse cluster. You can view the IP address in the cluster details.

- Step 7** Click **Test**. MgC verifies whether the cloud service can be connected using the information you provided. If the test is successful, the connection can be set up.
- Step 8** After the connection test is successful, click **Confirm**. The cloud service connection is created.
- Step 9** On the **Connection Management** page, view the created connection and its basic information. In the **Operation** column, click **Modify** to modify the connection settings.

----End

2.12.3.2 Creating a Connection to a Source Component

To verify the consistency of data stored using big data components, you need to establish connections between MgC and the big data components.

The supported source big data components include:

- Doris
- HBase
- ClickHouse
- Hive Metastore
- Delta Lake (with metadata)
- Delta Lake (without metadata)
- Hudi (with metadata)
- Hudi (without metadata)

Procedure

- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**. Select the created [migration project](#) in the upper left corner of the page.
- Step 3** In the **Features** area, click **Connection Management**.
- Step 4** Click **Create Connection** in the upper right corner of the page.
- Step 5** Select a big data component and click **Next**.
- Step 6** Set parameters based on the big data component you selected.
 - [Parameters for creating a connection to Doris](#)
 - [Parameters for creating a connection to HBase](#)
 - [Parameters for creating a connection to ClickHouse](#)
 - [Parameters for creating a connection to Hive Metastore](#)
 - [Parameters for creating a connection to Delta Lake \(with metadata\)](#)
 - [Parameters for creating a connection to Delta Lake \(without metadata\)](#)
 - [Parameters for creating a connection to Hudi \(with metadata\)](#)
 - [Parameters for creating a connection to Hudi \(without metadata\)](#)

Table 2-73 Parameters for creating a connection to Doris

Parameter	Configuration
Connection To	Select Source .
Connection Name	The default name is Doris-4 random characters (including letters and numbers). You can also customize a name.
Doris Credential	Select the source Doris credential added to the Edge device. For details about how to add credentials, see "Big data - Doris" in Adding Resource Credentials .

Parameter	Configuration
Database IP Address	Enter the IP address for accessing the source Doris cluster.
Database Port	Enter the port used for accessing the source Doris cluster. The default value is 3306.
Database Name	Enter the name of the source Doris database.

Table 2-74 Parameters for creating a connection to HBase

Parameter	Configuration
Connection To	Select Source .
Connection Name	The default name is HBase-4 random characters (including letters and numbers). You can also customize a name.
HBase Credential	Select the source HBase credential added to the Edge device. For details about how to add credentials, see "Big data - HBase" in Adding Resource Credentials .
Secured Cluster	Choose whether the cluster is secured.
ZooKeeper IP Address	Enter the IP address for connecting to the source ZooKeeper node. You can enter the public or private IP address of the ZooKeeper node.
ZooKeeper Port	Enter the port for connecting to the source ZooKeeper node.
HBase Version	Select the source HBase version.

Table 2-75 Parameters for creating a connection to ClickHouse

Parameter	Configuration
Connection To	Select Source .
Connection Name	The default name is ClickHouse-4 random characters (including letters and numbers). You can also customize a name.
ClickHouse Credential (Optional)	Select the source ClickHouse credential added to the Edge device. For details about how to add credentials, see "Big data - ClickHouse" in Adding Resource Credentials .
Secured Cluster	Choose whether the cluster is secured.

Parameter	Configuration
ClickHouse Server IP Address	Enter the IP address for accessing the source ClickHouse server. Generally, the IP address refers to that of the server where ClickHouse is hosted.
HTTP Port	If the source ClickHouse cluster is unsecured, enter the HTTP port for communicating with the ClickHouse server. The default value is 8123.
HTTP SSL/TLS Port	If the source ClickHouse cluster is secured, enter the HTTPS port for communicating with the ClickHouse server.

Table 2-76 Parameters for creating a connection to Hive Metastore

Parameter	Configuration
Connection To	Select Source .
Connection Name	The default name is Hive-Metastore-4 random characters (including letters and numbers). You can also customize a name.
Secure Connection	Choose whether to enable secure connection. <ul style="list-style-type: none"> • If Hive Metastore is deployed in an unsecured cluster, do not enable secure connection. • If Hive Metastore is deployed in a secured cluster, enable secure connection and provide access credentials. For details about how to obtain and add credentials to MgC, see "Big data - Hive Metastore" in Adding Resource Credentials.
Hive Version	Select the source Hive version. CAUTION If the source Hive version is 2.1.1, select 1.x .
Hive Metastore IP Address	Enter the IP address for connecting to the Hive Metastore node.
Hive Metastore Thrift Port	Enter the port for connecting to the Hive Metastore Thrift service. The default port is 9083.

Parameter	Configuration
Connect to Metadata Database	<p>During an incremental data verification, querying with Hive Metastore on more than 30,000 partitions may lead to a memory overflow (OOM) since all partition information is loaded into memory. Connecting to the MySQL metadata database can effectively prevent this issue.</p> <ul style="list-style-type: none"> • If you disable this option, the system queries the information of Hive tables and partitions using Hive Metastore. • If you enable this option, configure the MySQL database information. The system will query the information of Hive tables and partitions through the MySQL database. You need to set the following parameters: <ul style="list-style-type: none"> - Metadata Database Type: Only MySQL is supported. - MySQL Credential: Select the credential for accessing the MySQL database. You need to add the credential to Edge and synchronize it to MgC. For details, see Adding Resource Credentials. - MySQL Node IP Address: Enter the IP address of the MySQL database server. - MySQL Port: Enter the port of the MySQL database service. - Database Name: Enter the name of the database that stores the Hive table metadata. <p>NOTE Ensure that the entered MySQL credential, node IP address, service port, and database name match the MySQL database used by Hive. Otherwise, data verification will fail.</p>

Table 2-77 Parameters for creating a connection to Delta Lake (with metadata)

Parameter	Configuration
Connection To	Select Source .
Connection Name	The default name is Delta-Lake-with-metadata-4 random characters (including letters and numbers). You can also customize a name.
Executor Credential	Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in Adding Resource Credentials .
Executor IP Address	Enter the IP address for connecting to the executor.
Executor Port	Enter the port for connecting to the executor.

Parameter	Configuration
Spark Client Directory	Enter the installation directory of the Spark client.
Environment Variable Address	Enter the absolute path of the environment variable file (configuration file), for example, /opt/bigdata/client/bigdata_env .
SQL File Location	<p>Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory.</p> <p>NOTICE After the migration is complete, you need to manually clear the folders generated at this location to release storage space.</p>

Table 2-78 Parameters for creating a connection to Delta Lake (without metadata)

Parameter	Configuration
Connection To	Select Source .
Connection Name	The default name is Delta-Lake-without-metadata-4 random characters (including letters and numbers). You can also customize a name.
Executor Credential	Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in Adding Resource Credentials .
Executor IP Address	Enter the IP address for connecting to the executor.
Executor Port	Enter the port for connecting to the executor.
Spark Client Directory	Enter the installation directory of the Spark client.
Environment Variable Address	Enter the absolute path of the environment variable file (configuration file), for example, /opt/bigdata/client/bigdata_env .
SQL File Location	<p>Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory.</p> <p>NOTICE After the migration is complete, you need to manually clear the folders generated at this location to release storage space.</p>

Table 2-79 Parameters for creating a connection to Hudi (with metadata)

Parameter	Configuration
Connection To	Select Source .
Connection Name	The default name is Hudi-with-metadata-4 random characters (including letters and numbers). You can also customize a name.
Executor Credential	Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in Adding Resource Credentials .
Executor IP Address	Enter the IP address for connecting to the executor.
Executor Port	Enter the port for connecting to the executor.
Spark Client Directory	Enter the installation directory of the Spark client.
Environment Variable Address	Enter the absolute path of the environment variable file (configuration file), for example, /opt/bigdata/client/bigdata_env .
SQL File Location	Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory. NOTICE After the migration is complete, you need to manually clear the folders generated at this location to release storage space.

Table 2-80 Parameters for creating a connection to Hudi (without metadata)

Parameter	Configuration
Connection To	Select Source .
Connection Name	The default name is Hudi-without-metadata-4 random characters (including letters and numbers). You can also customize a name.
Executor Credential	Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in Adding Resource Credentials .
Executor IP Address	Enter the IP address for connecting to the executor.
Executor Port	Enter the port for connecting to the executor.
Spark Client Directory	Enter the installation directory of the Spark client.
Environment Variable Address	Enter the absolute path of the environment variable file (configuration file), for example, /opt/bigdata/client/bigdata_env .

Parameter	Configuration
SQL File Location	<p>Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the directory.</p> <p>NOTICE After the migration is complete, you need to manually clear the folders generated at this location to release storage space.</p>

Step 7 Click **Test**. MgC verifies whether the component can be connected using the information you provided. If the test is successful, the connection can be set up.

Step 8 After the connection test is successful, click **Confirm**. The connection is created.

Step 9 On the **Connection Management** page, view the created connection and its basic information. In the **Operation** column, click **Modify** to modify the connection settings.

----End

2.12.4 Creating a Table Group and Adding Tables to the Group

Group source tables before verifying their consistency.

NOTICE

- A maximum of 10,000 tables can be imported at a time.
- The tables to be imported must come from the same metadata source.
- When a table is imported, the system does not verify how many table groups the table is added to or what verification rules are configured for those groups. You are advised to import a table into a maximum of three table groups with different verification rules.

Prerequisites

- You have completed all [preparations](#).
- [A source connection has been created](#).

Creating a Table Group

Step 1 Sign in to the [MgC](#) console.

Step 2 In the navigation pane on the left, choose **Migrate > Big Data Verification**. Select the created [migration project](#) in the upper left corner of the page.

Step 3 In the **Features** area, click **Table Management**.

Step 4 Under **Table Groups**, click **Create**.

Step 5 Configure the parameters listed in [Table 2-81](#).

Table 2-81 Parameters for creating a table group

Parameter	Description
Table Group	Enter a name.
Metadata Source	Select the created source connection . CAUTION A table group can only contain tables coming from the same metadata source.
Verification Rule	Select the method for verifying data consistency and the inconsistency tolerance. MgC provides multiple verification rules for you to choose. For details about these rules, click View More .
Description (Optional)	Enter a description to identify the table group.

Step 6 Click **Confirm**. The table group is created. In the table group list, you can view information about the created table group.

After the table group is created, you can add tables to the table group by referring to [Adding Tables to a Table Group](#).

----End

Adding Tables to a Table Group

Step 1 On the **Table Management** page, click the **Tables** tab.

Step 2 Choose **Table Management > Import** above the list.

Step 3 Select a metadata connection and the table groups that tables are added to.

Step 4 Click **Download** to download the import template to the local PC. Open the import template and fill in the information of the tables to be added.

NOTICE

- A maximum of 10,000 tables can be imported at a time.
- Tables in a table group must come from the same metadata source.
- Cells in the template must not contain formulas and must be in text format. Otherwise, the table parsing will fail.
- If a Delta Lake (with metadata) or Hudi (with metadata) connection is selected for **Metadata Connection**, the **source_path** parameter in the template is mandatory.
- If a Delta Lake (without metadata) or Hudi (without metadata) connection is selected for **Metadata Connection**, the **source_path** and **target_path** parameters in the template are mandatory.

Step 5 Go back to the console and click **Select File** to upload the populated template to MgC.

Step 6 Click **Confirm**. Then you can view the tables in the table list.

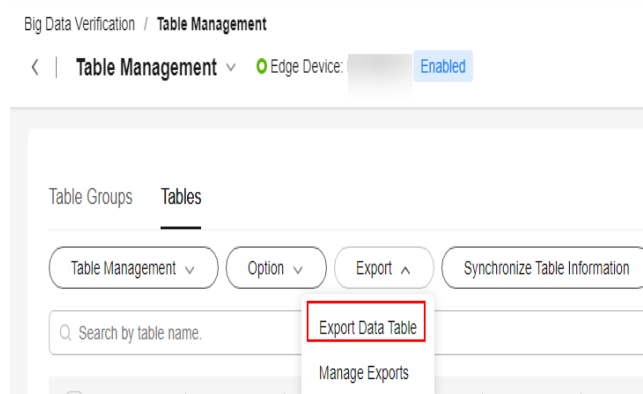
----End

Exporting Data Tables

You can export information about tables from Delta Lake (with metadata) and Hudi (with metadata) to CSV files. Information about data tables from sources without metadata cannot be exported.

Step 1 On the **Table Management** page, click the **Tables** tab.

Step 2 Choose **Export > Export Data Table** above the list.



Step 3 Select the table groups that contain the data tables to be exported and click **Confirm**.

Step 4 After the export is complete, choose **Export > Manage Exports**.

Step 5 Click **Download** in the **Operation** column to download the data table information to the local PC.

----End

2.12.5 Creating a Connection to the Target

2.12.5.1 Creating an Executor Connection

Executors are used to obtain data for consistency verification from the source and the target.

You need to connect the source and target executors to MgC, so that they can receive and execute commands from MgC. The supported big data components include:

- Hive Metastore
- Delta Lake (with metadata)
- Delta Lake (without metadata)
- Hudi (with metadata)
- Hudi (without metadata)

CAUTION

- Ensure that CLI clients are installed on both the source and target executors.
- You need to create connections to both the source and target executors.

Procedure

- Step 1** Sign in to the **MgC** console.
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**. Select the created **migration project** in the upper left corner of the page.
- Step 3** In the **Features** area, click **Connection Management**.
- Step 4** Click **Create Connection** in the upper right corner of the page.
- Step 5** Select an executor, click **Next**, and set connection parameters based on **Table 2-82**.

Table 2-82 Parameters for creating an executor connection

Parameter	Configuration
Connection To	Select an option as required. NOTICE The CDH executor supports only the migration source. The MRS executor supports both the migration source and target.
Connection Name	The default name is <i>Executor type-4</i> random characters (including letters and numbers). You can also customize a name.
Executor Credential	Select the login credential of the executor. For details about how to add credentials, see "Big data - Executor" in Adding Resource Credentials .
Executor IP Address	Enter the IP address for connecting to the executor.
Executor Port	Enter the port for connecting to the executor. The default port is 22 .
Installation Directory	Enter the installation directory of the MRS or CDH client. That is, the directory where ./install.sh is installed.
SQL File Location	Enter a directory for storing the SQL files generated for consistency verification. You must have the read and write permissions for the folder. NOTICE After the verification is complete, you need to manually clear the folders generated at this location to release storage space.

- Step 6** Click **Test**. MgC verifies whether the executor can be connected using the configuration information. If the test is successful, the executor can be connected.

- Step 7** After the connection test is successful, click **Confirm**. The executor connection is created.
- Step 8** On the **Connection Management** page, view the created connection and its basic information. In the **Operation** column, click **Modify** to modify the connection settings.

----End

2.12.5.2 Creating a Connection to a Target Cloud Service

To verify the consistency of data stored using big data cloud services, you need to establish connections between MgC and the source and target cloud services.

The supported target big data cloud services include:

- Data Lake Insight (DLI)
- CloudTable (ClickHouse)
- CloudTable (HBase)

Procedure

- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**. Select a [migration project](#) in the upper left corner of the page.
- Step 3** In the **Features** area, click **Connection Management**.
- Step 4** Click **Create Connection** in the upper right corner of the page.
- Step 5** Select a big data cloud service and click **Next**.
- Step 6** Configure the connection parameters based on the big data service you selected.
- [Parameters for creating a connection to DLI](#)
 - [Parameters for creating a connection to CloudTable \(ClickHouse\)](#)
 - [Parameters for creating a connection to CloudTable \(HBase\)](#)

Table 2-83 Parameters for creating a connection to DLI

Parameter	Configuration
Connection To	Select Target .
Connection Name	The default name is DLI-4 random characters (including letters and numbers). You can also customize a name.
DLI Credential	Select the credential used for accessing DLI. For details about how to add credentials, see "Big data - DLI" in Adding Resource Credentials . If the selected credential is the one you currently use to access MgC, you can select This is my MgC credential , and the projects in the region you choose will be listed.

Parameter	Configuration
Region/Project	Select the region and project where the data to be verified is located.
Queue	Enter the name of the DLI queue to be verified. The queue must be a SQL queue.

Table 2-84 Parameters required for creating a connection to CloudTable (ClickHouse)

Parameter	Configuration
Connection To	Select Target .
Connection Name	The default name is CloudTable-ClickHouse4 random characters (including letters and numbers). You can also customize a name.
CloudTable (ClickHouse) Credential	Select the credential of the CloudTable (ClickHouse) cluster. For details about how to add credentials, see "Big data - ClickHouse" in Adding Resource Credentials . When you add the credential, select Username/Password for Authentication and enter the username and password for logging in to the ClickHouse cluster created on CloudTable.
Database URL	Enter the URL to access the CloudTable (ClickHouse) database. You can obtain the access address from the basic information of the ClickHouse cluster .

Table 2-85 Parameters required for creating a connection to CloudTable (HBase)

Parameter	Configuration
Connection To	Select Target .
Connection Name	The default name is CloudTable-HBase4 random characters (including letters and numbers). You can also customize a name.
CloudTable (HBase) Credential	No credential is required for unsecured clusters.
Secured Cluster	Currently, only unsecured clusters (common clusters) are supported.
Database URL	Enter the URL to access the CloudTable (HBase) database. You can obtain the access address from the basic information of the HBase cluster. The address displayed after ZK Link (Intranet) is one you need.

- Step 7** Click **Test**. MgC verifies whether the cloud service can be connected using the configuration information. If the test is successful, the cloud services can be connected.
- Step 8** After the connection test is successful, click **Confirm**. The cloud service connection is created.
- Step 9** On the **Connection Management** page, view the created connection and its basic information. In the **Operation** column, click **Modify** to modify the connection settings.

----End

2.12.5.3 Creating a Connection to a Target Component

To verify the consistency of data stored using big data components, you need to establish connections between MgC and the big data components.

The supported big data components include:

- Doris
- HBase
- ClickHouse
- Hive Metastore

Procedure

- Step 1** Sign in to the **MgC** console.
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**. Select a **migration project** in the upper left corner of the page.
- Step 3** In the **Features** area, click **Connection Management**.
- Step 4** Click **Create Connection** in the upper right corner of the page.
- Step 5** Select a big data component and click **Next**.
- Step 6** Set parameters based on the big data component you selected.
- [Parameters for creating a connection to Doris](#)
 - [Parameters for creating a connection to HBase](#)
 - [Parameters for creating a connection to ClickHouse](#)
 - [Parameters for creating a connection to Hive Metastore](#)

Table 2-86 Parameters for creating a connection to Doris

Parameter	Configuration
Connection To	Select Target .
Connection Name	The default name is Doris-4 random characters (including letters and numbers). You can also customize a name.

Parameter	Configuration
Doris Credential	Select the target Doris credential added to Edge. For details about how to add credentials, see "Big data - Doris" in Adding Resource Credentials .
Database IP Address	Enter the IP address for accessing the target Doris cluster. To obtain the address, log in to FusionInsight Manager , choose Cluster > Services > Doris , and check Host Where Leader Locates .
Database Port	Enter the port for accessing the target Doris cluster. To obtain the port, log in to FusionInsight Manager , choose Cluster > Services > Doris > Configurations , and search for query_port .
Database Name	Enter the name of the target Doris database.

Table 2-87 Parameters for creating a connection to HBase

Parameter	Configuration
Connection To	Select Target .
Connection Name	The default name is HBase-4 random characters (including letters and numbers). You can also customize a name.
HBase Credential	Select the target HBase credential added to Edge. For details about how to add credentials, see Big data - HBase in Adding Resource Credentials .
Secured Cluster	Choose whether the cluster is secured.
ZooKeeper IP Address	Enter the IP address for connecting to the target ZooKeeper node. You can enter the public or private IP address of the ZooKeeper server.
ZooKeeper Port	Enter the port number for connecting to the target ZooKeeper node. The default value is 2181.
HBase Version	Select the target HBase version.

Table 2-88 Parameters for creating a connection to ClickHouse

Parameter	Configuration
Connection To	Select Target .
Connection Name	The default name is ClickHouse-4 random characters (including letters and numbers). You can also customize a name.

Parameter	Configuration
ClickHouse Credential (Optional)	Select the target ClickHouse credential added to Edge. For details about how to add credentials, see "Big data - ClickHouse" in Adding Resource Credentials .
Secured Cluster	Choose whether the cluster is secured.
ClickHouse IP Address	Enter the IP address of the target ClickHouse server.
HTTP Port	If the ClickHouse cluster is unsecured, enter the HTTP port for communicating with the target ClickHouse server. The default value is 8123.
HTTP SSL/TLS Port	If the ClickHouse cluster is secured, enter the HTTPS port for communicating with the target ClickHouse server.

Table 2-89 Parameters for creating a connection to Hive Metastore

Parameter	Configuration
Connection To	Select Target .
Connection Name	The default name is Hive-Metastore-4 random characters (including letters and numbers). You can also customize a name.
Secure Connection	Choose whether to enable secure connection. <ul style="list-style-type: none"> • If Hive Metastore is deployed in an unsecured cluster, do not enable secure connection. • If Hive Metastore is deployed in a secured cluster, enable secure connection and provide access credentials. For details about how to obtain and add credentials to MgC, see "Big data - Hive Metastore" in Adding Resource Credentials.
Hive Version	Select the target Hive version. CAUTION Only version 3.x is available.
Hive Metastore IP Address	Enter the IP address for connecting to the Hive Metastore node.
Hive Metastore Thrift Port	Enter the port for connecting to the Hive Metastore Thrift service. The default port is 9083.

Parameter	Configuration
Connect to Metadata Database	<p>During an incremental data verification, querying with Hive Metastore on more than 30,000 partitions may lead to a memory overflow (OOM) since all partition information is loaded into memory. Connecting to the MySQL metadata database can effectively prevent this issue.</p> <ul style="list-style-type: none"> • If you disable this option, the system queries the information of Hive tables and partitions using Hive Metastore. • If you enable this option, configure the MySQL database information. The system will query the information of Hive tables and partitions through the MySQL database. You need to set the following parameters: <ul style="list-style-type: none"> - Metadata Database Type: Only MySQL is supported. - MySQL Credential: Select the credential for accessing the MySQL database. You need to add the credential to Edge and synchronize it to MgC. For details, see Adding Resource Credentials. - MySQL Node IP Address: Enter the IP address of the MySQL database server. - MySQL Port: Enter the port of the MySQL database service. - Database Name: Enter the name of the database that stores the Hive table metadata. <p>NOTE Ensure that the entered MySQL credential, node IP address, service port, and database name match the MySQL database used by Hive. Otherwise, data verification will fail.</p>

Step 7 Click **Test**. MgC verifies whether the component can be connected using the configuration information. If the test is successful, the cloud services can be connected.

Step 8 After the connection test is successful, click **Confirm**. The connection is created.

Step 9 On the **Connection Management** page, view the created connection and its basic information. In the **Operation** column, click **Modify** to modify the connection settings.

----End

2.12.6 Creating and Executing Verification Tasks

You can use the created source and target connections to create verification tasks.

For details about the supported big data components and verification methods, see [Overview](#).

Precautions

- A pair of verification tasks for the source and the target must use the same verification method.
- If the source and target HBase clusters use different security authentication modes, the verification tasks cannot be executed at the same time, or they will fail to be executed. This is because the authentication information must be handled differently in each cluster. The secured cluster requires authentication information to be loaded, whereas the non-secured cluster needs that information cleared.
- A verification task must be completed within the same day. If the task execution extends past midnight (00:00), the verification results may be inaccurate. Plan verification tasks carefully to avoid executing across days.
- If the source Lindorm service is locked due to arrears, you can still create data connections and verification tasks, but data access and operations will be restricted, preventing verification tasks from being executed. Before starting data verification, ensure that the source Lindorm service is active and your account balance is sufficient. If the service is locked, promptly pay the fee to unlock it. Once the service is unlocked, you can execute the data verification tasks again.

Notes and Constraints

- Before verifying data migrated from EMR Delta Lake to MRS Delta Lake, please note:
 - If the source EMR cluster uses Spark 3.3.1, data verification is supported regardless of whether the source cluster contains metadata storage.
 - If the source EMR cluster uses Spark 2.4.8, data verification is supported only when the source cluster contains metadata storage.
- Verification is not available for HBase tables that only store cold data.
- The verification results of data migrated between Hive 2.x and Hive 3.x may be inaccurate. In Hive 2.x, when you query the fixed-length type CHAR (N) of data, if the actual data length does not meet the specified length N, Hive will pad the string with spaces to reach the required length. However, in Hive 3.x, this padding operation does not occur during queries. To avoid this issue, you are advised to use Beeline to perform the verification.
- Field verification is not supported if the source Alibaba Cloud cluster uses ClickHouse 21.8.15.7 and the target Huawei Cloud cluster uses ClickHouse 23.3.2.37. This is because the two versions process IPv4 and IPv6 data types and function calculation results differently.
- During the daily incremental verification, hourly incremental verification, and date-based verification for Hive, partitions with a Date-type partition field that does not follow the standard YYYY-MM-DD format cannot be verified.

Prerequisites

- A table group has been created, and tables to be verified have been added to the group. For details, see [Creating a Table Group and Adding Tables to the Group](#).
- Connections to the source and the target have been created. For details, see [Creating Connections](#)

Procedure

- Step 1** Sign in to the [MgC console](#).
- Step 2** In the navigation pane on the left, choose **Migrate > Big Data Verification**. Select a [migration project](#) in the upper left corner of the page.
- Step 3** In the **Features** area, click **Task Management**.
- Step 4** Click **Create Task** in the upper right corner of the page.
- Step 5** Select a big data component and verification method as needed and click **Next**.
- Step 6** Configure task parameters based on the selected big data component and verification method.

 **NOTE**

The task parameters vary with the big data component.

- [Parameters for creating a full verification task](#)
- [Parameters for creating a daily incremental verification task](#)
- [Parameters for creating an hourly incremental verification task](#)
- [Parameters for creating a date-based verification task](#)
- [Parameters for creating a selective verification task](#)

Table 2-90 Parameters for creating a full verification task

Area	Parameter	Configuration
Basic Info	Task Name	The default name is <i>Component-full-verification-4 random characters</i> (including letters and numbers). You can also customize a name.
Task Settings	Table Groups	Select the table groups that contain the tables to be verified.
	Executor Connection	This parameter is available for Hive, Delta Lake, and Hudi. <ul style="list-style-type: none"> • To create a verification task for the source, select the source executor connection. • To create a verification task for the target, select the target executor connection.
	DLI Connection	If DLI is selected in the previous step, the task can only be created for the target. You need to select the created DLI connection .
	Doris Connection	If Doris is selected in the previous step: <ul style="list-style-type: none"> • To create a verification task for the source, select the source Doris connection. • To create a verification task for the target, select the target Doris connection.

Area	Parameter	Configuration
	HBase Connection	<p>This parameter is available for HBase and CloudTable (HBase).</p> <ul style="list-style-type: none"> • To create a verification task for the source, select the source HBase connection. • To create a verification task for the target, select the target HBase or CloudTable (HBase) connection.
	ClickHouse Connection	<p>This parameter is available for ClickHouse, Alibaba Cloud ApsaraDB for ClickHouse, and CloudTable (ClickHouse).</p> <ul style="list-style-type: none"> • To create a verification task for the source, select the source MRS ClickHouse or Alibaba Cloud ApsaraDB for ClickHouse connection. • To create a verification task for the target, select the target MRS ClickHouse or CloudTable (ClickHouse) connection.
	Metadata Connection (Optional)	<p>This parameter is available for Delta Lake.</p> <p>To improve processing efficiency, you can select metadata connections to the source Delta Lake cluster where the groups of tables to be verified belong to.</p>
	Execution Time	<p>Specify when the task will be executed. After the task is activated, it will be automatically executed at the specified time every day.</p> <p>NOTE You are advised to run the verification during off-peak hours.</p>

Area	Parameter	Configuration
	Advanced Options	<ul style="list-style-type: none"> Concurrency: Specify the number of concurrent threads on an executor for the verification task. The default value is 3. The value ranges from 1 to 10. <p>CAUTION</p> <p>If you are creating a verification task for an Alibaba Cloud EMR Hive cluster, set this parameter based on the source data volume and master node specifications. Consider the following rules:</p> <ul style="list-style-type: none"> The total number of concurrent threads for verification tasks running simultaneously in the source cluster cannot exceed 70% of the total number of cores on the metadata node. The total resources allocated to verification tasks cannot exceed the resources of the execution queue. The total resources allocated to tasks can be calculated as follows: Allocated memory = Number of executors × Memory on an executor × Concurrency Allocated cores = Number of executors × Cores on an executor × Concurrency <p>Assume that the total source data volume is 500 GB spread across 10,000 tables, in which there are 8 large tables with 50 GB data and 100,000 partitions. The master node has 8 vCPUs and 32 GB of memory.</p> <ul style="list-style-type: none"> According to rule 1, the maximum number of concurrent requests is 5, which is the rounded down value of 5.6 (0.7×8). According to rule 2, you need to select spark-sql in the Execution Command area and set the following parameters: <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p>Execution Command</p> <p>baseline hive spark-sql</p> <p>executor-memory 4G</p> <p>master yarn</p> <p>num-executors 20</p> <p>executor-cores 2</p> <p>driver-memory 10G Add</p> <p><small>Script Preview</small></p> <p><small>spark-sql --executor-memory 4G --master yarn --num-executors 20 --executor-cores 2 --driver-memory 10G -f</small></p> </div> <p>executor-memory = 4G master = yarn num-executors = 20 executor-cores = 2 driver-memory = 10G</p> Max. SQL Statements Per File: Each time the task is executed, files are created for storing the SQL statements generated for querying tables. You can control how many SQL statements can be stored in a single file. The default value is 10. The recommended value ranges from 1 to 50.

Area	Parameter	Configuration
		<ul style="list-style-type: none"> • Timeout (s): indicates the maximum time allowed for an SQL statement to end normally. The unit is second (s). The default value is 600. The value ranges from 600 to 7,200. • Send SMN Notifications: Determine whether to use SMN to notify you of the task status in a timely manner through emails, SMS messages, or customized URLs. <p>NOTICE</p> <ul style="list-style-type: none"> - Before enabling this function, you need to create a topic on the SMN console. For details, see Creating a Topic. - Using this function may incur a small amount of fees, which are billed by SMN. For details, see SMN Billing.
Data Filtering	Non-partitioned Table Verification	<p>Decide how to verify non-partitioned tables.</p> <ul style="list-style-type: none"> • Verify all: All non-partition tables are verified as consistent. • Skip all: All non-partitioned tables are skipped during consistency verification. • Filter by update time: Only non-partitioned tables whose update time falls within the specified time range are verified as consistent. The update time of a non-partitioned table may not be accurate if it contains non-inserted data, and it may be excluded from verification.
	Advanced Options	<p>Max Fields Per SQL Statement: Limit how many fields can be queried by one SQL statement. Too many or few fields in a SQL statement results in low query efficiency. The default value 0 means no limit is set. The value ranges from 100 to 500.</p>
OBS Bucket Check	-	<ul style="list-style-type: none"> • If you need to upload task logs and content verification results to an OBS bucket for management and analysis, configure an OBS bucket. After the bucket is configured, the task logs and content verification results will be automatically uploaded to the specified OBS bucket. • If you do not need to upload the task logs and content verification results to OBS, select I confirm that I only need to view logs and data verification results on Edge and do not need to upload them to OBS.

Area	Parameter	Configuration
Command Parameters (This parameter is only available for Hive.)	Security Authentication	<p>If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the .keytab file that contains the authentication key to the executor.</p> <ul style="list-style-type: none"> • Keytab Path: Enter the path where the .keytab file is stored on the executor. • Keytab Principal: Enter the principal of the .keytab file.
	Execution Command	<p>You can configure Beeline or Spark SQL command parameters to run SQL statements for verifying data consistency.</p> <ul style="list-style-type: none"> • Beeline: a command line tool used to interact with Hive. • Spark SQL: used to execute SQL statements to query and analyze data.
MaxCompute Parameters (This item is only available for MaxCompute.)	-	Add MaxCompute parameters as needed. For details about the parameters, see MaxCompute Documentation .
Execution Settings (This item is only available for DLI.)	Parameter	Set the parameters as required. For details about the supported custom parameters, see Custom Parameters .
Execution Settings (This item is only available for HBase.)	Run Mode	<p>The supported run modes include:</p> <p>Yarn: This mode applies to large-scale distributed environments. It can make full use of cluster resources and improve task concurrency and efficiency.</p> <p>Local: This mode applies to small-scale datasets or development and test environments for quick debugging and verification.</p>
	Parameters	Add command parameters based on the selected run mode and requirements.

Area	Parameter	Configuration
Command Parameters (This item is only available for Delta Lake and Hudi.)	Security Authentication (available for target Delta Lake clusters)	If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the .keytab file that contains the authentication key to the executor. <ul style="list-style-type: none"> • Keytab Path: Enter the path where the .keytab file is stored on the executor. • Keytab Principal: Enter the principal of the .keytab file.
	spark-sql	Spark SQL is a module used in Spark for structured data processing. In Spark applications, you can seamlessly use SQL statements or DataSet APIs to query structured data. For more information, see SparkSQL Principles . Retain the default settings.

Area	Parameter	Configuration
	spark-submit	<p>This is a basic Spark shell command used to submit Spark applications. The command is as follows:</p> <pre>./bin/spark-submit \ --class <main-class> \ --master <master-url> \ ... # other options \ <application-jar> \ [application-arguments]</pre> <p>Parameter description:</p> <ul style="list-style-type: none"> ● --class: indicates the name of the class of a Spark application. ● --master: indicates the master to which the Spark application links, such as Yarn-client and Yarn-cluster. ● application-jar: indicates the path of the JAR file of the Spark application. ● application-arguments: indicates the parameter required to submit the Spark application. (This parameter can be empty.) <p>The parameters that need to be added depend on the scenario:</p> <ul style="list-style-type: none"> ● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake cluster that uses Spark 3, add the following parameters: <ul style="list-style-type: none"> - Parameter: jars - Value: '/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-core_2.12-*.jar,/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-storage-*.jar' <p>CAUTION Replace the parameter values with the actual environment directory and Delta Lake version.</p> ● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake 2.1.0 cluster that uses Spark 2.4.8, add the following parameter: <ul style="list-style-type: none"> - Parameter: mgc.delta.spark.version - Value: 2

Table 2-91 Parameters for creating a daily incremental verification task

Area	Parameter	Configuration
Basic Info	Task Name	The default name is <i>Component-daily-incremental-verification-4 random characters</i> (including letters and numbers). You can also customize a name.
Task Settings	Table Groups	Select the table groups that contain the tables to be verified.
	Executor Connection	This parameter is available for Hive, Delta Lake, and Hudi. <ul style="list-style-type: none"> To create a verification task for the source, select the source executor connection. To create a verification task for the target, select the target executor connection.
	DLI Connection	If DLI is selected in the previous step, the task can only be created for the target. You need to select the created DLI connection .
	Doris Connection	If Doris is selected in the previous step: <ul style="list-style-type: none"> To create a verification task for the source, select the source Doris connection. To create a verification task for the target, select the target Doris connection.
	HBase Connection	If HBase is selected in the previous step: <ul style="list-style-type: none"> To create a verification task for the source, select the source HBase connection. To create a verification task for the target, select the target HBase or CloudTable (HBase) connection.
	(Optional) Metadata Connection	This parameter is available for Hive and Delta Lake. If you are creating a verification task for the target Hive cluster, select the metadata connection to this Hive cluster. The connection is used to check whether the partitions to be verified can be found in the target cluster. If you are creating a verification task for the source Delta Lake cluster, to improve processing efficiency, you can select metadata connections to the source Delta Lake cluster.
	Execution Time	Specify when the task will be executed. After the task is activated, it will be automatically executed at the specified time every day.

Area	Parameter	Configuration
	Advanced Options	<ul style="list-style-type: none"> Concurrency: Specify the number of concurrent threads on an executor for the verification task. The default value is 3. The value ranges from 1 to 10. <p>CAUTION</p> <p>If you are creating a verification task for an Alibaba Cloud EMR Hive cluster, set this parameter based on the source data volume and master node specifications. Consider the following rules:</p> <ul style="list-style-type: none"> The total number of concurrent threads for verification tasks running simultaneously in the source cluster cannot exceed 70% of the total number of cores on the metadata node. The total resources allocated to verification tasks cannot exceed the resources of the execution queue. The total resources allocated to tasks can be calculated as follows: Allocated memory = Number of executors × Memory on an executor × Concurrency Allocated cores = Number of executors × Cores on an executor × Concurrency <p>Assume that the total source data volume is 500 GB spread across 10,000 tables, in which there are 8 large tables with 50 GB data and 100,000 partitions. The master node has 8 vCPUs and 32 GB of memory.</p> <ul style="list-style-type: none"> According to rule 1, the maximum number of concurrent requests is 5, which is the rounded down value of 5.6 (0.7×8). According to rule 2, you need to select spark-sql in the Execution Command area and set the following parameters: <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p>Execution Command</p> <p>baseline hive spark-sql</p> <p>executor-memory 4G</p> <p>master yarn</p> <p>num-executors 20</p> <p>executor-cores 2</p> <p>driver-memory 10G Add</p> <p>Script Preview</p> <pre>spark-sql --executor-memory 4G --master yarn --num-executors 20 --executor-cores 2 --driver-memory 10G -f</pre> </div> <p>executor-memory = 4G master = yarn num-executors = 20 executor-cores = 2 driver-memory = 10G</p> Max. SQL Statements Per File: Each time the task is executed, files are created for storing the SQL statements generated for querying tables. You can control how many SQL statements can be stored in a single file. The default value is 10. The recommended value ranges from 1 to 50.

Area	Parameter	Configuration
		<ul style="list-style-type: none"> ● Timeout (s): indicates the maximum time allowed for an SQL statement to end normally. The unit is second (s). The default value is 600. The value ranges from 600 to 7,200. ● Send SMN Notifications: Determine whether to use SMN to notify you of the task status in a timely manner through emails, SMS messages, or customized URLs. <p>NOTICE</p> <ul style="list-style-type: none"> - Before enabling this function, you need to create a topic on the SMN console. For details, see Creating a Topic. - Using this function may incur a small amount of fees, which are billed by SMN. For details, see SMN Billing.
Data Filtering	Incremental Scope	<p>Select the time period in which the incremental data needs to be verified as consistent. By default, a 24-hour period is selected. T indicates the execution time of the task, and T-n indicates a time $n \times 24$ hours before the execution time.</p> <p>If you select Consecutive days, the system verifies consistency of the incremental data generated during these consecutive days.</p>
	Non-partitioned Table Verification	<p>Decide how to verify non-partitioned tables.</p> <ul style="list-style-type: none"> ● Verify all: All non-partition tables are verified. ● Skip all: All non-partitioned tables are skipped during consistency verification. ● Filter by update time: Only non-partitioned tables whose update time falls within the specified time range are verified as consistent. The update time of a non-partitioned table may not be accurate if it contains non-inserted data, and it may be excluded from verification.

Area	Parameter	Configuration
	Advanced Options	<ul style="list-style-type: none"> ● Partition Filtering: Determine to filter table partitions by creation time or update time. <ul style="list-style-type: none"> - By update time: An update time indicates the timestamp a table partition was last modified or updated. Choose this option if you are concerned about the latest status or changes of data in a partition. - By creation time: A creation time indicates the timestamp when a partition was created. Choose this option if you are concerned about the data generated from the time when the partition is created to a certain time point. ● Max. Partitions: Limit how many partitions in a table are verified. The default value is 3. The value ranges from 1 to 50. For example, if this parameter is set to 3, the system verifies the consistency of only the first three partitions that are sorted by ID in descending order. ● Max Fields Per SQL Statement: Limit how many fields can be queried by one SQL statement. Too many or few fields in a SQL statement results in low query efficiency. The default value 0 means no limit is set. The value ranges from 100 to 500.
OBS Bucket Check	-	<ul style="list-style-type: none"> ● If you need to upload task logs and content verification results to an OBS bucket for management and analysis, configure an OBS bucket. After the bucket is configured, the task logs and content verification results will be automatically uploaded to the specified OBS bucket. ● If you do not need to upload the task logs and content verification results to OBS, select I confirm that I only need to view logs and data verification results on Edge and do not need to upload them to OBS.

Area	Parameter	Configuration
Execution Script (This parameter is only available for Hive.)	Security Authentication	<p>If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the .keytab file that contains the authentication key to the executor.</p> <ul style="list-style-type: none"> • Keytab Path: Enter the path where the .keytab file is stored on the executor. • Keytab Principal: Enter the principal of the .keytab file.
	Execution Command	<p>You can configure Beeline or Spark SQL command parameters to run SQL statements for verifying data consistency.</p> <ul style="list-style-type: none"> • Beeline: a command line tool used to interact with Hive. • Spark SQL: a command line tool used to execute SQL statements to query and analyze Hive data.
MaxCompute Parameters (MaxCompute)	-	Add MaxCompute parameters as needed. For details about the parameters, see MaxCompute Documentation .
Execution Settings (This item is only available for DLI.)	Parameter	Set the parameters as required. For details about the supported custom parameters, see Custom Parameters .
Statistics Configuration (HBase)	Run Mode	<p>The supported run modes include:</p> <p>Yarn: This mode applies to large-scale distributed environments. It can make full use of cluster resources and improve task concurrency and efficiency.</p> <p>Local: This mode applies to small-scale datasets or testing and development environments. It enables rapid debugging and verification.</p>
	Parameter	Add command parameters based on the selected run mode and requirements.

Area	Parameter	Configuration
Command Parameters (available for Delta Lake and Hudi)	Security Authentication (Only available for target Delta Lake clusters)	<p>If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the .keytab file that contains the authentication key to the executor.</p> <ul style="list-style-type: none"> • Keytab Path: Enter the path where the .keytab file is stored on the executor. • Keytab Principal: Enter the principal of the .keytab file.
	spark-sql	<p>Spark SQL is a module used in Spark for structured data processing. In Spark applications, you can seamlessly use SQL statements or DataSet APIs to query structured data. For more information, see SparkSQL Principles. Retain the default settings.</p>

Area	Parameter	Configuration
	spark-submit	<p>This is a basic Spark shell command used to submit Spark applications. The command is as follows:</p> <pre>./bin/spark-submit \ --class <main-class> \ --master <master-url> \ ... # other options \ <application-jar> \ [application-arguments]</pre> <p>Parameter description:</p> <ul style="list-style-type: none"> ● --class: indicates the name of the class of a Spark application. ● --master: indicates the master to which the Spark application links, such as Yarn-client and Yarn-cluster. ● application-jar: indicates the path of the JAR file of the Spark application. ● application-arguments: indicates the parameter required to submit the Spark application. (This parameter can be empty.) <p>The parameters that need to be added depend on the scenario:</p> <ul style="list-style-type: none"> ● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake cluster that uses Spark 3, add the following parameters: <ul style="list-style-type: none"> - Parameter: jars - Value: '/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-core_2.12-*.jar,/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-storage-*.jar' <p>CAUTION Replace the parameter values with the actual environment directory and Delta Lake version.</p> ● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake 2.1.0 cluster that uses Spark 2.4.8, add the following parameter: <ul style="list-style-type: none"> - Parameter: mgc.delta.spark.version - Value: 2

Table 2-92 Parameters for creating an hourly incremental verification task

Area	Parameter	Configuration
Basic Info	Task Name	The default name is <i>Component-hourly incremental verification-4 random characters</i> (including letters and numbers). You can also customize a name.
Task Settings	Table Groups	Select the table groups that contain the tables to be verified.
	Executor Connection	This parameter is available for Hive, Delta Lake, and Hudi. <ul style="list-style-type: none"> To create a verification task for the source, select the source executor connection. To create a verification task for the target, select the target executor connection.
	DLI Connection	If DLI is selected in the previous step, the task can only be created for the target. You need to select the created DLI connection .
	Doris Connection	If Doris is selected in the previous step: <ul style="list-style-type: none"> To create a verification task for the source, select the source Doris connection. To create a verification task for the target, select the target Doris connection.
	Metadata Connection (Optional)	This parameter is available for Hive and Delta Lake. If you are creating a verification task for the target Hive cluster, select the metadata connection to this Hive cluster. The connections are used to check whether the partitions to be verified can be found in the target cluster. To improve processing efficiency, you can select metadata connections to the source Delta Lake cluster where the groups of tables to be verified belong to.
	Start Time	Specify when the task will be executed. After the task is activated, it will be automatically executed at the specified time.

Area	Parameter	Configuration
	Advanced Options	<ul style="list-style-type: none"> Concurrency: Specify the number of concurrent threads on an executor for the verification task. The default value is 3. The value ranges from 1 to 10. <p>CAUTION</p> <p>If you are creating a verification task for an Alibaba Cloud EMR Hive cluster, set this parameter based on the source data volume and master node specifications. Consider the following rules:</p> <ul style="list-style-type: none"> - The total number of concurrent threads for verification tasks running simultaneously in the source cluster cannot exceed 70% of the total number of cores on the metadata node. - The total resources allocated to verification tasks cannot exceed the resources of the execution queue. The total resources allocated to tasks can be calculated as follows: Allocated memory = Number of executors × Memory on an executor × Concurrency Allocated cores = Number of executors × Cores on an executor × Concurrency <p>Assume that the total source data volume is 500 GB spread across 10,000 tables, in which there are 8 large tables with 50 GB data and 100,000 partitions. The master node has 8 vCPUs and 32 GB of memory.</p> <ul style="list-style-type: none"> - According to rule 1, the maximum number of concurrent requests is 5, which is the rounded down value of 5.6 (0.7×8). - According to rule 2, you need to select spark-sql in the Execution Command area and set the following parameters: <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p>Execution Command</p> <p>baseline hive spark-sql</p> <p>executor-memory 4G</p> <p>master yarn</p> <p>num-executors 20</p> <p>executor-cores 2</p> <p>driver-memory 10G Add</p> </div> <pre>Script Preview spark-sql --executor-memory 4G --master yarn --num-executors 20 --executor-cores 2 --driver-memory 10G -f</pre> <p>executor-memory = 4G master = yarn num-executors = 20 executor-cores = 2 driver-memory = 10G</p>

Area	Parameter	Configuration
		<p>The unit is second (s). The default value is 600. The value ranges from 600 to 7,200.</p> <ul style="list-style-type: none"> • Send SMN Notifications: Determine whether to use SMN to notify you of the task status in a timely manner through emails, SMS messages, or customized URLs. <p>NOTICE</p> <ul style="list-style-type: none"> - Before enabling this function, you need to create a topic on the SMN console. For details, see Creating a Topic. - Using this function may incur a small amount of fees, which are billed by SMN. For details, see SMN Billing.
Data Filtering	Execution Interval	Control how frequent the task will be executed.
	Non-partitioned Table Verification	<p>Decide how to verify non-partitioned tables.</p> <ul style="list-style-type: none"> • Verify all: All non-partition tables are verified as consistent. • Skip all: All non-partitioned tables are skipped during consistency verification. • Filter by update time: Only non-partitioned tables whose update time falls within the specified time range are verified as consistent. The update time of a non-partitioned table may not be accurate if it contains non-inserted data, and it may be excluded from verification.

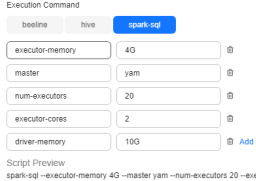
Area	Parameter	Configuration
	Advanced Options	<ul style="list-style-type: none"> ● Partition Filtering: Determine to filter table partitions by creation time or update time. <ul style="list-style-type: none"> – By update time: An update time indicates the last time a table partition was modified or updated. Choose this option if you are concerned about the latest status or changes of data in a partition. – By creation time: A creation time indicates the timestamp when a partition was created. Choose this option if you are concerned about the data generated from the time when the partition is created to a certain time point. ● Max. Partitions: Limit how many partitions in a table are verified. The default value is 3. The value ranges from 1 to 50. For example, if this parameter is set to 3, the system verifies the consistency of only the first three partitions that are sorted by ID in descending order. ● Max Fields Per SQL Statement: Limit how many fields can be queried by one SQL statement. Too many or few fields in a SQL statement results in low query efficiency. The default value 0 means no limit is set. The value ranges from 100 to 500.
OBS Bucket Check	-	<ul style="list-style-type: none"> ● If you need to upload task logs and content verification results to an OBS bucket for management and analysis, configure an OBS bucket. After the bucket is configured, the task logs and content verification results will be automatically uploaded to the specified OBS bucket. ● If you do not need to upload the task logs and content verification results to OBS, select I confirm that I only need to view logs and data verification results on Edge and do not need to upload them to OBS.

Area	Parameter	Configuration
Execution Script (This parameter is only available for Hive.)	Security Authentication	If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the .keytab file that contains the authentication key to the executor. <ul style="list-style-type: none"> • Keytab Path: Enter the path where the .keytab file is stored on the executor. • Keytab Principal: Enter the principal of the .keytab file.
	Execution Command	You can configure Beeline or Spark SQL command parameters to run SQL statements for consistency verification. <ul style="list-style-type: none"> • Beeline: a command line tool used to interact with Hive. • Spark SQL: a command line tool used to execute SQL statements to query and analyze Hive data.
MaxCompute Parameters (MaxCompute)	-	Add MaxCompute parameters as needed. For details about the parameters, see MaxCompute Documentation .
Execution Settings (This item is only available for DLI.)	Parameter	Set the parameters as required. For details about the supported custom parameters, see Custom Parameters .
Command Parameters (available for Delta Lake and Hudi)	Security Authentication (Only available for target Delta Lake clusters)	If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the .keytab file that contains the authentication key to the executor. <ul style="list-style-type: none"> • Keytab Path: Enter the path where the .keytab file is stored on the executor. • Keytab Principal: Enter the principal of the .keytab file.

Area	Parameter	Configuration
	spark-sql	<p>Spark SQL is a module used in Spark for structured data processing. In Spark applications, you can seamlessly use SQL statements or DataSet APIs to query structured data. For more information, see SparkSQL Principles. Retain the default settings.</p>
	spark-submit	<p>This is a basic Spark shell command used to submit Spark applications. The command is as follows:</p> <pre>./bin/spark-submit \ --class <main-class> \ --master <master-url> \ ... # other options <application-jar> \ [application-arguments]</pre> <p>Parameter description:</p> <ul style="list-style-type: none"> ● --class: indicates the name of the class of a Spark application. ● --master: indicates the master to which the Spark application links, such as Yarn-client and Yarn-cluster. ● application-jar: indicates the path of the JAR file of the Spark application. ● application-arguments: indicates the parameter required to submit the Spark application. (This parameter can be empty.) <p>The parameters that need to be added depend on the scenario:</p> <ul style="list-style-type: none"> ● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake cluster that uses Spark 3, add the following parameter: <ul style="list-style-type: none"> - Parameter: jars - Value: '/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-core_2.12-*.jar,/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-storage-*.jar' <p>CAUTION Replace the parameter values with the actual environment directory and Delta Lake version.</p> ● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake 2.1.0 cluster that uses Spark 2.4.8, add the following parameter: <ul style="list-style-type: none"> - Parameter: mgc.delta.spark.version - Value: 2

Table 2-93 Parameters for creating a date-based verification task

Area	Parameter	Configuration
Basic Info	Task Name	The default name is <i>Component-date-based-Verification-4 random characters</i> (including letters and numbers). You can also customize a name.
Task Settings	Table Groups	Select the table groups that contain the tables to be verified.
	Executor Connection	This parameter is available for Hive, Delta Lake, and Hudi. <ul style="list-style-type: none"> To create a verification task for the source, select the source executor connection. To create a verification task for the target, select the target executor connection.
	DLI Connection	If DLI is selected in the previous step, the task can only be created for the target. You need to select the created DLI connection .
	Metadata Connection (Optional)	This parameter is available for Hive and Delta Lake. If you are creating a verification task for the target Hive cluster, select the metadata connection to this Hive cluster. The connection is used to check whether the partitions to be verified can be found in the target cluster. If you are creating a verification task for the source Delta Lake cluster, to improve processing efficiency, you can select metadata connections to the source Delta Lake cluster.
	Execution Time	Specify when the task will be executed. After the task is activated, it will be automatically executed at the specified time every day.

Area	Parameter	Configuration
	Advanced Options	<ul style="list-style-type: none"> Concurrency: Specify the number of concurrent threads on an executor for the verification task. The default value is 3. The value ranges from 1 to 10. <p>CAUTION</p> <p>If you are creating a verification task for an Alibaba Cloud EMR Hive cluster, set this parameter based on the source data volume and master node specifications. Consider the following rules:</p> <ul style="list-style-type: none"> The total number of concurrent threads for verification tasks running simultaneously in the source cluster cannot exceed 70% of the total number of cores on the metadata node. The total resources allocated to verification tasks cannot exceed the resources of the execution queue. The total resources allocated to tasks can be calculated as follows: Allocated memory = Number of executors × Memory on an executor × Concurrency Allocated cores = Number of executors × Cores on an executor × Concurrency <p>Assume that the total source data volume is 500 GB spread across 10,000 tables, in which there are 8 large tables with 50 GB data and 100,000 partitions. The master node has 8 vCPUs and 32 GB of memory.</p> <ul style="list-style-type: none"> According to rule 1, the maximum number of concurrent requests is 5, which is the rounded down value of 5.6 (0.7×8). According to rule 2, you need to select spark-sql in the Execution Command area and set the following parameters:  <pre> executor-memory = 4G master = yarn num-executors = 20 executor-cores = 2 driver-memory = 10G </pre> <ul style="list-style-type: none"> Max. SQL Statements Per File: Each time the task is executed, files are created for storing the SQL statements generated for querying tables. You can control how many SQL statements can be stored in a single file. The default value is 10. The recommended value ranges from 1 to 50.

Area	Parameter	Configuration
		<ul style="list-style-type: none"> • Timeout (s): indicates the maximum time allowed for an SQL statement to end normally. The unit is second (s). The default value is 600. The value ranges from 600 to 7,200. • Send SMN Notifications: Determine whether to use SMN to notify you of the task status in a timely manner through emails, SMS messages, or customized URLs. <p>NOTICE</p> <ul style="list-style-type: none"> - Before enabling this function, you need to create a topic on the SMN console. For details, see Creating a Topic. - Using this function may incur a small amount of fees, which are billed by SMN. For details, see SMN Billing.
Data Filtering	Time Range	<p>Select the time period in which the incremental data needs to be verified as consistent. By default, a 24-hour period is selected. T indicates the execution time of the task, and T-n indicates a time $n \times 24$ hours before the execution time.</p> <p>If you select Consecutive days, the system verifies consistency of the incremental data generated during the specified days.</p>
	Non-partitioned Table Verification	<p>Decide how to verify non-partitioned tables.</p> <ul style="list-style-type: none"> • Verify all: All non-partition tables are verified as consistent. • Skip all: All non-partitioned tables are skipped during consistency verification. • Filter by update time: Only non-partitioned tables whose update time falls within the specified time range are verified as consistent. The update time of a non-partitioned table may not be accurate if it contains non-inserted data, and it may be excluded from verification.
	Advanced Options	<p>Max Fields Per SQL Statement: Limit how many fields can be queried by one SQL statement. Too many or few fields in a SQL statement results in low query efficiency. The default value 0 means no limit is set. The value ranges from 100 to 500.</p>

Area	Parameter	Configuration
OBS Bucket Check	-	<ul style="list-style-type: none"> If you need to upload task logs and content verification results to an OBS bucket for management and analysis, configure an OBS bucket. After the bucket is configured, the task logs and content verification results will be automatically uploaded to the specified OBS bucket. If you do not need to upload the task logs and content verification results to OBS, select I confirm that I only need to view logs and data verification results on Edge and do not need to upload them to OBS.
Execution Script (Hive)	Security Authentication	<p>If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the .keytab file that contains the authentication key to the executor.</p> <ul style="list-style-type: none"> Keytab Path: Enter the path where the .keytab file is stored on the executor. Keytab Principal: Enter the user name corresponding to the .keytab file.
	Execution Command	<p>You can configure Beeline or Spark SQL command parameters to run SQL statements for consistency verification.</p> <ul style="list-style-type: none"> Beeline: a command line tool used to interact with Hive. Spark SQL: a command line tool used to execute SQL statements to query and analyze Hive data.
MaxCompute Parameters (MaxCompute)	-	<p>Add MaxCompute parameters as needed. For details about the parameters, see MaxCompute Documentation.</p>
Execution Settings (This item is only available for DLI.)	Parameter	<p>Set the parameters as required. For details about the supported custom parameters, see Custom Parameters.</p>

Area	Parameter	Configuration
Command Parameters (available for Delta Lake and Hudi)	Security Authentication (available for target Delta Lake clusters)	If security authentication (for example, Kerberos authentication) is enabled for the big data cluster, select this option and configure the security authentication command. You must first manually upload the .keytab file that contains the authentication key to the executor. <ul style="list-style-type: none"> • Keytab Path: Enter the path where the .keytab file is stored on the executor. • Keytab Principal: Enter the principal of the .keytab file.
	spark-sql	Spark SQL is a module used in Spark for structured data processing. In Spark applications, you can seamlessly use SQL statements or DataSet APIs to query structured data. For more information, see SparkSQL Principles . Retain the default settings.

Area	Parameter	Configuration
	spark-submit	<p>This is a basic Spark shell command used to submit Spark applications. The command is as follows:</p> <pre>./bin/spark-submit \ --class <main-class> \ --master <master-url> \ ... # other options \ <application-jar> \ [application-arguments]</pre> <p>Parameter description:</p> <ul style="list-style-type: none"> ● --class: indicates the name of the class of a Spark application. ● --master: indicates the master to which the Spark application links, such as Yarn-client and Yarn-cluster. ● application-jar: indicates the path of the JAR file of the Spark application. ● application-arguments: indicates the parameter required to submit the Spark application. (This parameter can be empty.) <p>The parameters that need to be added depend on the scenario:</p> <ul style="list-style-type: none"> ● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake cluster that uses Spark 3, add the following parameter: <ul style="list-style-type: none"> - Parameter: jars - Value: '/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-core_2.12-*.jar,/opt/apps/DELTALAKE/deltalake-current/spark3-delta/delta-storage-*.jar' <p>CAUTION Replace the parameter values with the actual environment directory and Delta Lake version.</p> ● If you are creating a verification task for an Alibaba Cloud EMR Delta Lake 2.1.0 cluster that uses Spark 2.4.8, add the following parameter: <ul style="list-style-type: none"> - Parameter: mgc.delta.spark.version - Value: 2

Table 2-94 Parameters for creating a selective verification task

Area	Parameter	Configuration
Basic Info	Task Name	The default name is <i>Component-selective verification-4 random characters</i> (including letters and numbers). You can also customize a name.
Task Settings	Table Groups	Select the table groups that contain the tables to be verified.
	HBase Connection	This parameter is available for HBase and CloudTable (HBase). <ul style="list-style-type: none"> To create a verification task for the source, select the source HBase connection. To create a verification task for the target, select the target HBase or CloudTable (HBase) connection.
	Advanced Options	<ul style="list-style-type: none"> Concurrency: Specify the number of concurrent threads on an executor for the verification task. The default value is 3. The value ranges from 1 to 10. Timeout (s): indicates the maximum time allowed for an SQL statement to end normally. The unit is second (s). The default value is 600. The value ranges from 600 to 7,200. Send SMN Notifications: Determine whether to use SMN to notify you of the task status in a timely manner through emails, SMS messages, or customized URLs. NOTICE <ul style="list-style-type: none"> Before enabling this function, you need to create a topic on the SMN console. For details, see Creating a Topic. Using this function may incur a small amount of fees, which are billed by SMN. For details, see SMN Billing.
Data Filtering	Time Range	Select the time period in which the data needs to be verified as consistent.

Area	Parameter	Configuration
OBS Bucket Check	-	<ul style="list-style-type: none"> If you need to upload task logs and content verification results to an OBS bucket for management and analysis, configure an OBS bucket. After the bucket is configured, the task logs and content verification results will be automatically uploaded to the specified OBS bucket. If you do not need to upload the task logs and content verification results to OBS, select I confirm that I only need to view logs and data verification results on Edge and do not need to upload them to OBS.
Execution Settings (HBase)	Run Mode	<p>The supported run modes include:</p> <ul style="list-style-type: none"> Yarn: For large-scale distributed environments. It can make full use of cluster resources and improve verification concurrency and efficiency. Local: For small-scale datasets or testing and development environments. It enables rapid debugging and verification.
	Parameter	Add command parameters based on the selected run mode and requirements.

Step 7 Click **Save**. After the creation is successful, the system automatically synchronizes the task settings to the Edge device. Then in the task list, you can view the created task and its settings synchronization status.

Step 8 After the settings synchronization is complete, execute the task using either of the following methods:

- **Automatic execution**: The task will be executed at the specified time automatically.
 - In the task list, locate the task and click **Activate** in the **Schedule Status** column.
 - In the displayed dialog box, click **OK** to activate the task.
- **Manual execution**: You can manually execute the task immediately.
 - In the task list, locate the task and click **Execute** in the **Operation** column.
 - In the displayed dialog box, click **OK** to execute the task immediately.

Step 9 Click **View Executions** in the **Operation** column. On the executions list page, you can:

- View the status, progress statistics, and execution start time and end time of each task execution.

CAUTION

If a task execution takes a long time or the page is incorrectly displayed, set the log level of the executor's Driver to **ERROR**.

- Upload the logs of a task execution to your OBS bucket for review and analysis by clicking **Upload Log** in the **Operation** column. Before uploading logs, you need to configure a log bucket on the Edge console. For details, see [Configuring a Log Bucket](#).
- Cancel a running execution or terminate an execution using the **Cancel/Terminate** button.
- If there are tables whose verification results are not obtained, obtain the results again by clicking **Path** in the **Statistics** column.

----End

2.12.7 Viewing and Exporting Verification Results

After the verification tasks on the source and the target are executed, you can view and export the verification results of tables by batch. A batch is a group of verification tasks executed on the same day. If a task is executed multiple times on a single day, only the latest verification results are included in the statistics. Its previous results will be overwritten.

Prerequisites

You have [created and executed verification tasks](#).

Precautions

When sum operations (like sum or allsum) are performed, if the results exceed the valid digit limit of the Double type, the precision is lost. Additionally, when very large floating-point numbers are verified, the actual differences may not be detected if they exceed the significant digits that the Double type can represent. In such cases, the calculated differences may erroneously appear as 0.

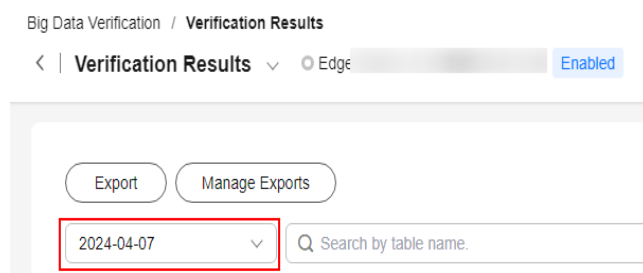
Viewing Verification Results

Step 1 Sign in to the **MgC** console.

Step 2 In the navigation pane on the left, choose **Migrate > Big Data Verification**. Select a **migration project** in the upper left corner of the page.

Step 3 In the **Features** area, click **Verification Results**.

Step 4 Select a task batch (date).



- Step 5** In the list, perform the following operations on a table:
- View the verification details of table partitions by clicking the **View** in the **Partitions** column. Then click **View Details** to view the verification results of a table partition.
 - Viewing the historical verification results by clicking **View History** in the **Operation** column.
- End

Exporting Verification Results

- Step 1** On the **Verification Results** page, click **Export**.
- Step 2** Select a batch and table group, and then click **Confirm**.
- Step 3** After the export is complete, click **Manage Exports**.
- Step 4** Click **Download** in the **Operation** column to download the verification results.
- End

2.12.8 Custom Parameters

The following table lists the custom parameters supported when you create a DLI verification task.

Table 2-95 Custom parameters supported for DLI verification tasks

Parameter	Default Value	Description
mgc.mc2dli.table.partition.enable	true	Indicates whether to query the DLI metadata when a DLI table partition is empty or missing. <ul style="list-style-type: none"> • If this parameter is set to true, the verification status of any empty DLI table partitions will be succeeded, and that of any missing partitions will be failed. • If this parameter is set to false, the verification status of any empty or missing DLI table partitions will be succeeded.
spark.sql.files.maxRecordsPerFile	0	The maximum number of records to be written into a single file. If the value is zero or negative, there is no limit.

Parameter	Default Value	Description
spark.sql.autoBroadcastJoinThreshold	209715200	<p>The maximum size of the table that displays all working nodes when a connection is executed. You can set this parameter to -1 to disable the display.</p> <p>NOTE Currently, only the configuration unit metastore table that runs the ANALYZE TABLE COMPUTE statistics noscan command and the file-based data source table that directly calculates statistics based on data files are supported.</p>
spark.sql.shuffle.partitions	200	The default number of partitions used to filter data for join or aggregation.
spark.sql.dynamicPartitionOverwrite.enabled	false	<p>Whether DLI overwrites the partitions where data will be written into during runtime. If you set this parameter to false, all partitions that meet the specified condition will be deleted before data overwrite starts. For example, if you set this parameter to false and use INSERT OVERWRITE to write partition 2021-02 to a partitioned table that has the 2021-01 partition, this partition will be deleted.</p> <p>If you set this parameter to true, DLI does not delete partitions before overwrite starts.</p>
spark.sql.files.maxPartitionBytes	134217728	The maximum number of bytes to be packed into a single partition when a file is read.
spark.sql.badRecordsPath	-	The path of bad records.

Parameter	Default Value	Description
spark.sql.legacy.correlated.scalar.query.enabled	false	<ul style="list-style-type: none">● If set to true:<ul style="list-style-type: none">– When there is no duplicate data in a subquery, executing a correlated subquery does not require deduplication from the subquery's result.– If there is duplicate data in a subquery, executing a correlated subquery will result in an error. To resolve this, the subquery's result must be deduplicated using functions such as max() or min().● If set to false: Regardless of whether there is duplicate data in a subquery, executing a correlated subquery requires deduplicating the subquery's result using functions such as max() or min(). Otherwise, an error will occur.