Cloud Bastion Host

User Guide

Issue	03
Date	2024-09-29

HUAWEI CLOUD COMPUTING TECHNOLOGIES CO., LTD.

Trademarks and Permissions

Notice

The purchased products, services and features are stipulated by the contract made between Huawei Cloud 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.

Huawei Cloud Computing Technologies Co., Ltd.

Address: Huawei Cloud Data Center Jiaoxinggong Road
Qianzhong Avenue
Gui'an New District
Gui Zhou 550029
People's Republic of China

Website: https://www.huaweicloud.com/intl/en-us/

Contents

1 Instances

1.1 Permissions Management

1.1.1 Creating a User and Granting Permissions for CBH Instances to It

To implement fine-grained permissions control for your CBH resources, **Identity and Access Management (IAM)** is exactly what you need. 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, providing access to CBH resources.
- Grant only the permissions required for users to perform a task.
- Entrust an account or cloud service to perform professional and efficient O&M on your CBH resources.

If your account does not require individual IAM users, skip over this section.

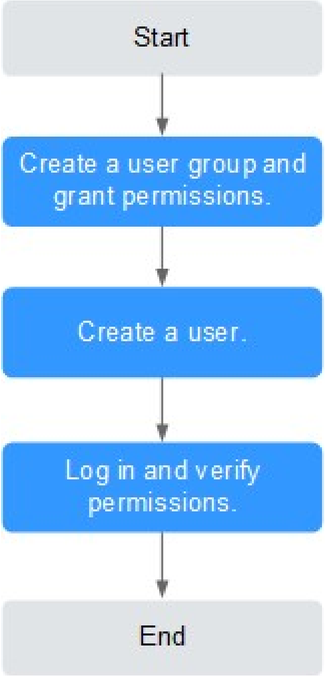
This section describes the procedure for granting permissions. **Figure 1-1** shows the process.

Prerequisites

Learn about the permissions supported by CBH and choose policies or roles based on your requirements. For more details, see **CBH Instance Permissions Management**.

Authorization Process

Figure 1-1 Process for granting permissions


Start
Create a user group and grant permissions.
Create a user.
Log in and verify permissions.
End

1. **Create a user group and assign permissions**.

   Create a user group on the IAM console, and attach the **CBH ReadOnlyAccess** policy to the group.

2. **Creating an IAM User**.

   Create a user on the IAM console and add the user to the group created in **1**.

3. **Log in** and verify permissions.

   Log in to the CBH console by using the created user, and verify that the user only has read permissions for CBH.

   - Choose **Service List** > **Cloud Bastion Host**. On the displayed page, click **Purchase CBH Instance**. If a message is displayed indicating that you do not have the permission to purchase the CBH instance (assume that the current permission contains only CBH ReadOnlyAccess), the CBH ReadOnlyAccess policy has taken effect.
   - Choose any other service in **Service List**. (Assume that the current permission contains only CBH ReadOnlyAccess). If a message appears indicating that you have insufficient permissions to access the service, the CBH ReadOnlyAccess policy has already taken effect.

1.1.2 Creating Custom Policies for CBH Instances

Custom policies can be created to supplement the system-defined policies of CBH. For the actions that can be added to custom policies, see **CBH Permissions and Supported Actions**.

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: Edit JSON policies from scratch or based on an existing policy.

For details, see **Creating a Custom Policy**. The following section contains examples of common custom policies for CBH instances.

Example Custom Policies

- Example 1: Allowing users to change CBH instance specifications and upgrade CBH instance version.

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "cbh:instance:upgrade",
                "cbh:instance:alterSpec"
            ]
        }
    ]
}
```

- Example 2: Denying a user request of restarting a CBH instance

  A deny policy must be used together with other policies. If the policies assigned to a user contain both Allow and Deny actions, the Deny actions take precedence over the Allow actions.

  The following method can be used to create a custom policy to disallow users who have the **CBH FullAccess** policy assigned to restart a CBH instance. Assign both **CBH FullAccess** and the custom policies to the group to which the user belongs. Then the user can perform all operations on CBH except restarting a CBH instance. The following is an example of a deny policy:

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Deny",
            "Action": [
                "cbh:instance:reboot"
            ]
        }
    ]
}
```

- Example 3: Defining permissions for multiple services in a policy

  A custom policy can contain the actions of multiple services that are of the global or project-level type. The following is an example policy containing actions of multiple services:

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "cbh:instance:create"
            ]
        },
        {
            "Effect": "Allow",
            "Action": [
                "vpc:subnets:get"
            ]
        },
        {
            "Effect": "Allow",
            "Action": [
                "ecs:cloudServerFlavors:get"
            ]
        }
    ]
}
```

1.1.3 Managing CBH Instance Permissions and Supported Actions

This section describes fine-grained permissions management for your CBH. If your account does not need individual IAM users, then you may skip over this section.

By default, new IAM users do not have any permissions assigned. You need to add a user to one or more groups, and assign permissions policies to these groups. Users inherit permissions from the groups to which they are added and can perform specified operations on cloud services based on the permissions.

Permissions are classified into **roles** and **policies** based on the authorization granularity. Roles: A type of coarse-grained authorization mechanism that defines permissions related to user responsibilities. Policies: A type of fine-grained authorization mechanism that defines permissions required to perform operations on specific cloud resources under certain conditions.

Supported Actions

CBH provides system-defined policies that can be directly used in IAM. You can also create custom policies and use them to supplement system-defined policies, implementing more refined access control.

- Permission: A statement in a policy that allows or denies certain operations.
- Action: Specific operations that are allowed or denied.

Table 1-1 Supported Actions (IAM 3.0)

Permission	API	Action	IAM Project	Enterprise Project
Querying total ECS quota	GET /v2/{project_id}/cbs/instance/ecs-quota	cbh:instance:getEcsQuota	√	×
Querying the AZ of a CBH instance	GET /v2/{project_id}/cbs/available-zone	cbh:instance:getAvailableZones	√	×

Permission	API	Action	IAM Project	Enterprise Project
Logging in to a CBH instance	POST /v2/{project_id}/cbs/instance/login	cbh:instance:login	√	×
Stopping a CBH instance	POST /v2/{project_id}/cbs/instance/stop	cbh:instance:stop	√	×
Restarting a CBH instance	POST /v2/{project_id}/cbs/instance/reboot	cbh:instance:reboot	√	×
Upgrading the CBH system version	POST /v2/{project_id}/cbs/instance/upgrade	cbh:instance:upgrade	√	×
Changing the password of the **admin** user for a CBH instance	PUT /v2/{project_id}/cbs/instance/password	cbh:instance:resetPassword	√	×
Starting a CBH instance	POST /v2/{project_id}/cbs/instance/start	cbh:instance:start	√	×
Expanding a CBH instance edition	PUT /v2/{project_id}/cbs/instance	cbh:instance:alterSpec	√	×
Creating a CBH instance	POST /v2/{project_id}/cbs/instance	cbh:instance:create	√	√
Binding or unbinding an EIP	● POST /v2/{project_id}/cbs/instance/{server_id}/eip/bind ● POST /v2/{project_id}/cbs/instance/{server_id}/eip/unbind	cbh:instance:eipOperate	√	×

Permission	API	Action	IAM Project	Enterprise Project
Creating a CBH agency	POST /v2/{project_id}/cbs/agency/authorization	cbh:agency:authorize	√	×
Querying the CBH instance list	GET /v2/{project_id}/cbs/instance/list	cbh:instance:list	√	×

Table 1-2 Supported Actions (IAM 5.0)

Permission	API	Action	Permission Dependency	IAM Project	Enterprise Project
Grants the permission to obtain the ECS quota.	GET /v2/{project_id}/cbs/instance/ecs-quota	cbh::getEcsQuota	ecs:cloudServerFlavors:get	√	×
Grants the permission to query the CBH instance quotas.	GET /v2/{project_id}/cbs/instance/quota	cbh::getQuota	-	√	×
Grants the permission to query the CBH status.	GET /v2/{project_id}/cbs/instance/{server_id}/status	cbh:instance:getInstanceStatus	-	√	×
Grants the permission to obtain the URLs for O&M of assets managed in CBH.	GET /v2/{project_id}/cbs/instance/get-om-url	cbh:instance:getOmUrl	-	√	×

Permission	API	Action	Permission Dependency	IAM Project	Enterprise Project
Grants the permission to obtain the authorization information of the CBH service from the tenant.	GET /v2/{project_id}/cbs/agency/authorization	cbh::getAuthorization	● iam:agencies:listAgencies ● iam:permissions:listRolesForAgencyOnProject	√	×
Grants the permission to query tags of CBH instances.	GET /v2/{project_id}/cbs/instance/{resource_id}/tags	cbh:instance:getInstanceTags	-	√	×
Grants the permission to start a CBH instance.	POST /v2/{project_id}/cbs/instance/start	cbh:instance:startInstance	-	√	×
Grants the permission to disable a CBH instance.	POST /v2/{project_id}/cbs/instance/stop	cbh:instance:stopInstance	-	√	×
Grants the permission to restart a CBH instance.	POST /v2/{project_id}/cbs/instance/reboot	cbh:instance:rebootInstance	-	√	×
Grants the permission to upgrade a CBH instance.	POST /v2/{project_id}/cbs/instance/upgrade	cbh:instance:upgradeInstance	-	√	×
Grants the permission to roll back a CBH instance.	POST /v2/{project_id}/cbs/instance/rollback	cbh:instance:rollbackInstance	-	√	×

Permission	API	Action	Permission Dependency	IAM Project	Enterprise Project
Grants the permission to log in to a CBH instance as an IAM user.	POST /v2/{project_id}/cbs/instance/login	cbh:instance:loginInstance	-	√	×
Grants the permission to reset a password for logging in to a CBH.	PUT /v2/{project_id}/cbs/instance/password	cbh:instance:resetInstancePassword	-	√	×
Grant the permission to switch the VPC of the bastion host instance.	PUT /v2/{project_id}/cbs/instance/vpc	cbh:instance:switchInstanceVpc	vpc:subnets:get	√	×
Grants the permission to reset the CBH instance login mode.	PUT /v2/{project_id}/cbs/instance/login-method	cbh:instance:resetInstanceLoginMethod	-	√	×
Grants the permission to delete a faulty CBH instance.	DELETE /v2/{project_id}/cbs/instance	cbh:instance:deleteInstance	-	√	×
Grants the permission to change a CBH instance.	PUT /v2/{project_id}/cbs/instance	cbh:instance:alterInstance	-	√	×

Permission	API	Action	Permission Dependency	IAM Project	Enterprise Project
Grants the permission to create a CBH instance.	POST /v2/{project_id}/cbs/instance	cbh:instance:createInstance	- vpc:quotas:list - vpc:subnets:list - vpc:subnets:get - vpc:securityGroups:get - ecs:cloudServerFlavors:get	√	√
Grants the permission to bind an EIP to a CBH instance.	POST /v2/{project_id}/cbs/instance/{server_id}/eip/bind	cbh:instance:bindInstanceEip	- eip:publicIps:list - eip:publicIps:update - eip:publicIps:get - eip:publicIps:associateInstance	√	×
Grants the permission to unbind an EIP from a CBH instance.	POST /v2/{project_id}/cbs/instance/{server_id}/eip/unbind	cbh:instance:unbindInstanceEip	- eip:publicIps:list - eip:publicIps:update - eip:publicIps:disassociateInstance	√	×
Grants the permission to update the security group of a CBH instance.	PUT /v2/{project_id}/cbs/instance/{server_id}/security-groups	cbh:instance:updateInstanceSecurityGroup	- vpc:ports:update - vpc:securityGroups:list	√	×

Permission	API	Action	Permission Dependency	IAM Project	Enterprise Project
Grants the permission to create or cancel the agency authorization for the CBH service.	POST /v2/{project_id}/cbs/agency/authorization	cbh::operateAuthorization	● iam:agencies:listAgencies ● iam:permissions:listRolesForAgencyOnProject ● iam:agencies:createAgency ● iam:agencies:deleteAgency ● iam:permissions:grantRoleToAgencyOnProject ● iam:permissions:revokeRoleFromAgencyOnProject	√	×
Grants the permission to log in to a CBH instance as user **admin**.	GET /v2/{project_id}/cbs/instances/{server_id}/admin-url	cbh:instance:loginInstanceAdmin	-	√	×

Permission	API	Action	Permission Dependency	IAM Project	Enterprise Project
Grants the permission to modify the type of single-node CBH instances.	PUT /v2/{project_id}/cbs/instance/type	cbh:instance:changeInstanceType	● vpc:quotas:list ● vpc:subnets:list ● vpc:subnets:get ● vpc:securityGroups:get ● ecs:cloudServerFlavors:get	√	×
Grants the permission to query all AZs.	GET /v2/{project_id}/cbs/available-zone	cbh::listAvailableZones	-	√	×
Grants the permission to query the CBH specifications.	GET /v2/{project_id}/cbs/instance/specification	cbh::listSpecifications	-	√	×
Grants the permission to list CBH instances.	GET /v2/{project_id}/cbs/instance/list	cbh:instance:listInstances	eps:enterpriseProjects:list	√	×
Grants the permission to query all tags.	GET /v2/{project_id}/cbs/instance/tags	cbh::listTags	-	√	×
Grants the permission to search for instances by tag.	POST /v2/{project_id}/cbs/instance/filter	cbh:instance:listInstancesByTag	-	√	×

Permission	API	Action	Permission Dependency	IAM Project	Enterprise Project
Grants the permission to count the number of instances that meet the tag conditions.	POST /v2/{project_id}/cbs/instance/count	cbh:instance:countInstancesByTag	-	√	×
Grants the permission to operate the resource tags of the CBH instance.	POST /v2/{project_id}/cbs/instance/{resource_id}/tags/action	cbh:instance:operateInstanceTags	-	√	×

1.2 Assigning Permissions Using IAM

1.2.1 Role/Policy-based Authorization

Role/policy-based permission provided by **Identity and Access Management (IAM)Identity and Access Management (IAM)** let you control access to CBH. With IAM, you can:

- Create IAM users for personnel based on your enterprise's organizational structure. Each IAM user has their own identity credentials for accessing CBH resources
- Grant only the permissions required for users to perform a task.
- Entrust an account or cloud service to perform professional and efficient O&M on your CBH resources.

If your account does not require individual IAM users, skip this chapter.

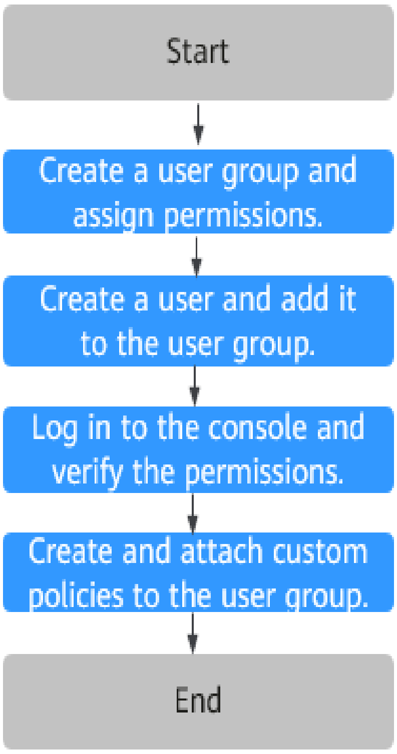
This section describes how to assign permissions based on roles and policies. **Figure 1-2** shows the authorization process.

Prerequisites

Learn about the permissions supported by CBH. For details about the permissions of other services, see **Permission SetPermission Set**.

Authorization Process

Figure 1-2 Process for granting permissions


Start
Create a user group and assign permissions.
Create a user and add it to the user group.
Log in to the console and verify the permissions.
Create and attach custom policies to the user group.
End

1. **Create a user group and grant permissionsCreate a user group and grant permissions**.

   Create a user group on the IAM console, and attach the **CBH ReadOnlyAccess** policy to the group.

2. **Create an IAM user and add it to the created user groupCreate an IAM user and add it to the created user group**.

   On the IAM console, create an IAM user and add it to the user group created in **1**.

3. **Log in as the IAM userLog in as the IAM user** and verify permissions.

   Log in to the CBH console by using the created user, and verify that the user only has read permissions for CBH.

   – Hover over **Service List** and choose **Cloud Bastion Host**. On the CBH console, click **Buy CBH Instance** in the upper right corner. If the CBH instance cannot be purchased (assume that the current permission contains only **CBH ReadOnlyAccess**), the **CBH ReadOnlyAccess** policy is in effect.

   – Choose another service from **Service List**. If a message appears indicating that you have insufficient permissions to access the service, the **CBH ReadOnlyAccess** policy is in effect.

Example CBH Custom Policies

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

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: Edit JSON policies from scratch or based on an existing policy.

For details, see . The following lists examples of common CBH custom policies.

- Example 1: Allowing users to change CBH instance specifications and upgrade CBH instance version.

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "cbh:instance:upgrade",
                "cbh:instance:alterSpec"
            ]
        }
    ]
}
```

- Example 2: Denying a user request of restarting a CBH instance

  A deny policy must be used together with other policies. If the policies assigned to a user contain both Allow and Deny actions, the Deny actions take precedence over the Allow actions.

  The following method can be used to create a custom policy to disallow users who have the **CBH FullAccess** policy assigned to restart a CBH instance. Assign both **CBH FullAccess** and the custom policies to the group to which the user belongs. Then the user can perform all operations on CBH except restarting a CBH instance. The following is an example of a deny policy:

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Deny",
            "Action": [
                "cbh:instance:reboot"
            ]
        }
    ]
}
```

- Example 3: Defining permissions for multiple services in a policy

  A custom policy can contain the actions of multiple services that are of the global or project-level type. The following is an example policy containing actions of multiple services:

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "cbh:instance:create"
            ]
        },
        {
            "Effect": "Allow",
            "Action": [
                "vpc:subnets:get"
            ]
        },
        {
            "Effect": "Allow",
            "Action": [
                "ecs:cloudServerFlavors:get"
            ]
        }
    ]
}
```

1.2.2 Identity Policy-based Authorization

Identity-based permission provided by **Identity and Access Management (IAM)Identity and Access Management (IAM)** let you control access to CBH. With IAM, you can:

- Create IAM users for employees based on your enterprise's organizational structure. Each IAM user will have their own security credentials for accessing CBH resources.
- Grant only the permissions required for users to perform a task.
- Entrust an account or cloud service to perform professional and efficient O&M on your CBH resources.

If your account meets your permissions requirements, you can skip this section.

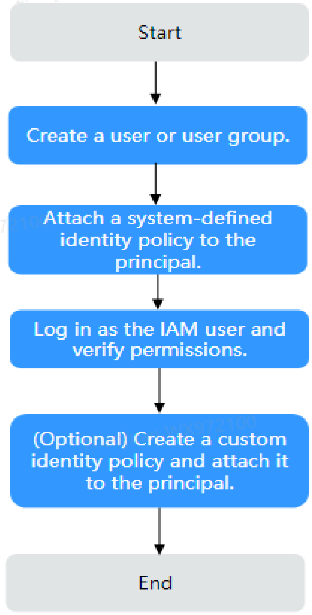
Figure 1-3 shows the process flow of identity policy-based authorization.

Prerequisites

Learn about the permissions supported by CBH. For details about the permissions of other services, see **Permission SetPermission Set**.

Authorization Process

Figure 1-3 Process for granting permissions


Start
Create a user or user group.
Attach a system-defined identity policy to the principal.
Log in as the IAM user and verify permissions.
(Optional) Create a custom identity policy and attach it to the principal.
End

1. Create a user or user group on the IAM console.
2. .

   Assign the **CBHReadOnlyAccess** system policy to the user or user group.
3. **Log in as the IAM userLog in as the IAM user** and verify permissions.

   Log in to the console as an authorized user and verify the permissions.
   - Hover over **Service List** and choose **Cloud Bastion Host**. On the CBH console, click **Buy CBH Instance** in the upper right corner. If the CBH instance cannot be purchased (assume that the current permission contains only **CBH ReadOnlyAccess**), the **CBHReadOnlyAccess** policy is in effect.
   - Choose another service from **Service List**. If a message appears indicating that you have insufficient permissions to access the service, the **CBHReadOnlyAccess** policy is in effect.

Example Custom Identity Policies for CBH

You can create custom identity policies to supplement the system-defined identity policies of CBH. You can create custom identity 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: Edit policies from scratch or based on an existing policy in JSON format.

For details, see .

When creating a custom identity policy, use the **Resource** element to specify the resources the policy applies to and use the **Condition** element (condition keys) to control when the policy is in effect.

The following provides examples of custom identity policies for CBH.

- Example 1: Allowing users to change CBH instance specifications and upgrade CBH instance version.
```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "cbh:instance:upgrade",
                "cbh:instance:alterSpec"
            ]
        }
    ]
}
```
- Example 2: Denying a user request of restarting a CBH instance

  A deny policy must be used together with other policies. If the policies assigned to a user contain both Allow and Deny actions, the Deny actions take precedence over the Allow actions.

  The following method can be used to create a custom policy to disallow users who have the **CBH FullAccess** policy assigned to restart a CBH instance. Assign both **CBH FullAccess** and the custom policies to the group to which the user belongs. Then the user can perform all operations on CBH except restarting a CBH instance. The following is an example of a deny policy:

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Deny",
            "Action": [
                "cbh:instance:reboot"
            ]
        }
    ]
}
```

- Example 3: Defining permissions for multiple services in a policy

  A custom policy can contain the actions of multiple services that are of the global or project-level type. The following is an example policy containing actions of multiple services:

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "cbh:instance:create"
            ]
        },
        {
            "Effect": "Allow",
            "Action": [
                "vpc:subnets:get"
            ]
        },
        {
            "Effect": "Allow",
            "Action": [
                "ecs:cloudServerFlavors:get"
            ]
        }
    ]
}
```

1.3 Creating a CBH Instance

Overview

A Cloud Bastion Host (CBH) instance corresponds to an independently running CBH O&M management system. To perform real-time, remote, and efficient O&M on your resources, create a CBH account on the CBH instance you purchased, log in to the CBH system mapped to the CBH instance, and configure the O&M system.

Prerequisites

- You have obtained the information about the resources to be managed in the CBH system, and the resources are in the region where CBH is available.

Procedure

Step 1 Log in to the management console.

Step 2 Click ☰ in the upper left corner of the page, select a region, and choose **Security & Compliance** > **Cloud Bastion Host** to go to the CBH instance management console.

Step 3 Click **Create CBH Instance**.

Step 4 Select **CBH Instance** for **Service Type** and specify other parameters as required. For more information, see **Table 1-3**.

Table 1-3 Parameters for purchasing a CBH instance

Parameter	Description
Billing Mode	The billing mode of the CBH instance. Currently, only **Pay-per-use** is supported. Pay-per-use billing is a postpaid mode in which you pay for what you use by the hour. **NOTE** After the pay-per-use billing mode is enabled, the billing stops only when the target instance is deleted, regardless of the instance running status.
Instance Type	Select a single-node or primary/standby instance type based on your service requirements. ● **Single-node**: Only one bastion host is available after the purchase. ● **Primary/Standby**: After the purchase, two bastion hosts are delivered to form a two-node cluster. Once the primary bastion host is unavailable, the standby one takes over the job immediately. **NOTE** If you buy a primary/standby instance, do not disable HA, or logins will fail.
AZ	An AZ is the location where the bastion host instance you buy is deployed. **NOTE** If you buy a primary/standby instance, two bastion hosts will be deployed in different AZs. So, you need to select the primary and standby AZs. You can retain the default settings.
Instance Name	Name of the CBH instance.

Parameter	Description
Edition	Specifications of your CBH instance. CBH provides the standard and professional editions. You can select 50, 100, 200, 500, 1,000, 2,000, and 5,000 asset specifications. Asset quantity indicates the maximum number of resources your instance can manage and the maximum number of concurrent connections your instance can establish. The vCPUs and the size of data and system disks vary depending on the asset quantity.. For example, if you select 100 assets, the number of resources your instance can manage and the maximum number of concurrent connections your instance can establish are both 100. **NOTE** Currently, primary/standby instances cannot manage public network resources using EIPs.
Storage Package	If you need more storage for a CBH instance, you can buy a storage package.
VPC	The Virtual Private Cloud (VPC) where your instance is located. Select a VPC in the current region. If no VPC is available in the current region, click **View VPC** and create one. **NOTE** ● By default, networks in VPCs in different regions or even in the same region are not connected. The network communications on these different networks are isolated from each other. This is not the case for different AZs on the same VPC. Two networks on the same VPC should be able to communicate with each other even if they are in different AZs. ● A CBH instance directly manages and allows access from resources, such as ECSs, in the same VPC in the same region. To manage resources such as ECSs in different VPCs in the same region, establish a VPC peering connection or use a VPN to connect networks. For details, see **Creating a VPC Peering Connection**. Managing ECSs across regions is not recommended. For more information, see **VPC Planning**.

Parameter	Description
Security Group	The security group for your CBH instance. The default security group is **Sys-default** in the current region. If no security group is available, click **Manage Security Groups** to create a security group or configure a new one. **NOTE** ● A security group provides access rules for the CBH instances and resources that have the same security protection requirements and are mutually trusted in the same VPC. CBH instances are protected by these access rules after being added the security group. . ● CBH instances and ECSs can be added to the same security groups. They do not affect each other when implementing security group rules. ● For details about how to modify a security group, see **Changing Security Groups**. ● Before creating HA instances, ensure that the security group allows inbound traffic from ports 22, 31036, 31679, and 31873. ● When a bastion host instance is created, ports 80, 8080, 443, and 2222 are automatically enabled. If you do not need to use them, disable them immediately after the instance is created. ● During cross-version upgrade, ports 22, 31036, 31679, and 31873 are automatically enabled for the instance. After the upgrade, keep port 31679 enabled and disable other ports immediately if you do not need to use them. For more information about security groups, see **How Do I Configure a Security Group for a CBH Instance?**
Subnet	The subnet in the current VPC for your CBH instance. **NOTE** The selected subnet must be in the VPC network segment. For more information, see **Creating a VPC**.
Assign IPv4 Address	Select **Auto** or **Manual**. If you select **Manual**, you can view the used IP addresses.

Parameter	Description
EIP	(Optional) Select an EIP in the current region. If no EIP is available in the current region, click **Purchase EIP** to create one. **NOTE** ● If you select an EIP when purchasing an instance, but the EIP fails to be bound to the instance after the instance is in the running state, the EIP may have been bound to other servers while the instance is being created. In this case, bind another EIP to the instance by referring to **Binding an EIP to a CBH Instance**. ● An EIP can be bound to only one cloud resource. A CBH instance cannot share an EIP with other cloud resources. After you created a CBH instance, you are required to bind an EIP to the instance for logging in to the CBH system. You need to create at least one EIP for a CBH instance. You can bind an EIP to the CBH instance now or later by referring to **Binding an EIP to a CBH Instance**. ● To meet the requirements of the CBH system, set the EIP bandwidth to 5 Mbit/s or higher. ● After the CBH instance is created, you can unbind the original EIP from the instance and bind a new EIP to it. For more information about EIPs, see **EIP Overview**.
Enterprise Project	Select the enterprise project the CBH instance belongs to. The **default** enterprise project is selected by default.
Username	The default username **admin** is used. **admin** is the system administrator account. This account has the highest operation permissions. Keep the account information secure.
Password	User-defined password of the **admin** user. **NOTE** ● The password must: – Contain 8 to 32 characters. – Contain at least three of the following types of characters: uppercase letters (A to Z), lowercase letters (a to z), digits (0 to 9), and following special characters: !@$%^-_=+[{}]:,./?~#* – Cannot contain the username or the username spelled backwards. – Cannot contain more than two consecutive identical characters. ● Enter the same password in the **Password** and **Confirm Password** text boxes. ● The CBH system cannot obtain the password of system administrator **admin**. Keep your account information secure. ● When you log in to your CBH system as **admin** for the first time, change the password and configure mobile phone number as prompted. Otherwise, you cannot log in to the CBH system. ● If you forget the password of user **admin** after a CBH instance is purchased, you can **reset the password**.
Required Duration	Required duration of the instance You can buy a CBH instance on a monthly or yearly basis.

Parameter	Description
Tag	**Tags**: It is recommended that you use the TMS predefined tag function to add the same tag to different cloud resources. If your organization has configured a tag policy for CBH, you need to add tags in compliance with the policy. If a tag does not comply with the tag policies, CBH instances may fail to be created. Contact your organization administrator to learn more about tag policies.

Step 5 Confirm details in the **Current Configuration** area and click **Next**.

NOTE

When receiving a network restriction notification, click **Enable** to eliminate the network restrictions so that the instance can be issued after purchase.

You can view the rules in the security group and firewall ACL.

- Access to port 9443 is allowed in the outbound direction of the security group to which your CBH instance belongs.
- The subnet where the instance locates is not associated with the firewall ACL, or the ACL rule of the associated firewall allows the instance to access port 9443 in the outbound direction.

Step 6 On the **Confirm** page, confirm the details, read the privacy statement, select **Privacy Statement**, and click **Submit**.

Step 7 Make your purchase and return to the CBH console. Check the newly purchased instance in the CBH instance list.

After a CBH instance is purchased, a mapped CBH system is automatically created for you, which takes about 10 minutes.

NOTE

Do not unbind an EIP from a CBH instance before the mapped CBH system is created. If you unbind an EIP from an instance before its status changes to **Running**, the mapped CBH system may fail to be created.

----End

1.4 Checking Instance Details

Each CBH instance maps to an independently running CBH system.

You can manage CBH instances after obtaining an account with the CBH operation permission.

Checking CBH Instance Information

Step 1 Log in to the management console.

Step 2 Click ☰ in the upper left corner of the page, select a region, and choose **Security** > **Cloud Bastion Host** to go to the CBH instance management page.

Step 3 Click the instance and check the instance details.

Table 1-4 Instance parameters

Parameter	Description
Instance Name	Instance name you specify. It cannot be modified after the instance is created.
Billing Mode	Billing mode of the current instance
VPC	VPC the instance belongs to
Server ID	ID of the server housing the current instance. The ID of the server for the standby node is included.
Security group	Virtual network security rule.
Instance Type	Instance type you select.
Subnet	Subnet of the VPC.
Standby Instance Status	Status of the standby node.
Virtual IP Address	Floating IP address of the current instance.
Specifications	Edition you select for your instance.
Upon Expiration	If an instance expires, it enters a grace period. You can check details about the grace period rules.
Private IP Address	Private IP address of the instance, including the IP address of the standby node.
Instance Version	Version of the instance.
Enterprise Project	Enterprise project that the instance belongs to.

----End

1.5 Resetting the Login Method for User admin

This topic walks you through how to reset the login method for user **admin** in case the **admin** account failed one or more multifactor authentication factors.

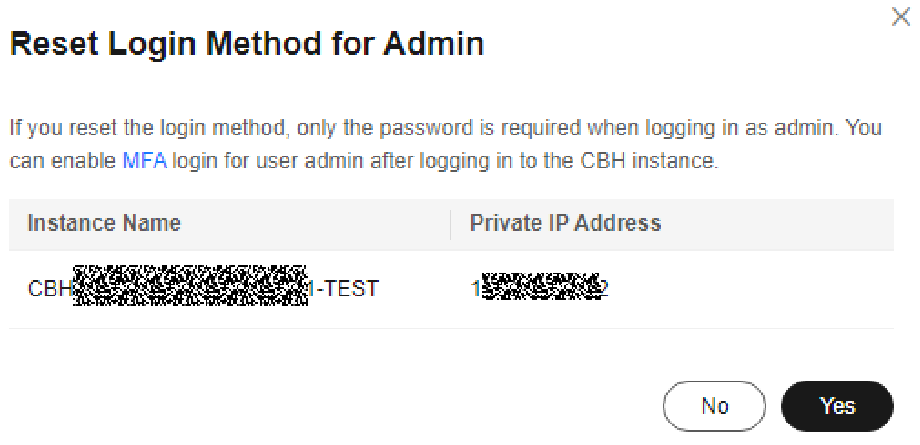
Procedure

Step 1 Log in to the management console.

Step 2 Locate the row containing the instance for which you want to reset login passwords. In the **Operation** column, choose **More** > **Reset** > **Reset Login Method for Admin**.

Step 3 In the displayed dialog box, click **OK** to reset the login method for user **admin**.

Figure 1-4 Resetting login method for user **admin**



Reset Login Method for Admin

If you reset the login method, only the password is required when logging in as admin. You can enable MFA login for user admin after logging in to the CBH instance.

Instance Name	Private IP Address
CBH[redacted]1-TEST	1[redacted]

NOTE

After the login method is reset, a password is required for user **admin** to log in to the CBH system. For details, see **Configuring Multifactor Verification**.

----End

1.6 Resetting the Password of User Admin

This topic describes how to reset the password of user admin for a CBH system.

To reset passwords of other system users, see **How Can I Reset Passwords of CBH System Users?**

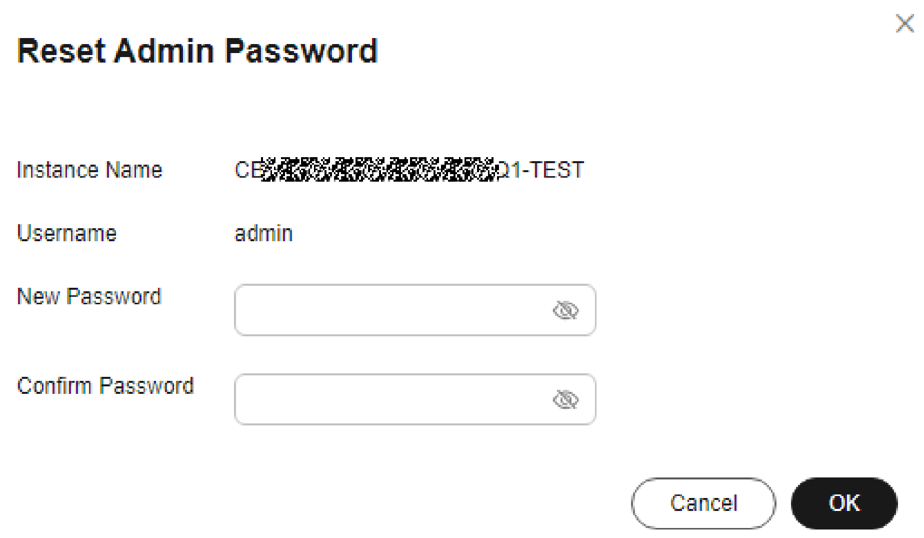
Procedure

Step 1 Log in to the management console.

Step 2 Locate the row containing the instance you want to restart. In the **Operation** column, choose **More** > **Reset** > **Reset Admin Password**.

Step 3 In the dialog box displayed, reset the password of the admin account.

Figure 1-5 Resetting a password



Reset Admin Password

Instance Name CB[redacted]01-TEST

Username admin

New Password

Confirm Password

Step 4 Click **OK**.

----End

1.7 Upgrading the CBH System Version

A CBH system of the latest version has system optimizations or new functions. To use those functions, upgrade your instances in a timely manner.

Precautions

- Before the upgrade
  - Back up data to ensure a quick rollback in case of upgrade failures.
- During the upgrade

  The version upgrade takes about 30 minutes. Although the CBH system is unavailable during this period, there is no impacts on host resources managed on the instance. However, to prevent important data loss, do not log in to the CBH system during the version upgrade.
- After the upgrade

  The CBH instance automatically restarts after the upgrade completes. You can then use the mapped CBH system.

  After the upgrade, you can use the configuration and storage data of the original CBH system. Version upgrading does not affect the original configuration and storage data of the CBH system.
- Rolling Back the Upgrade

  After the version upgrade is complete or during the cross-version upgrade, you can roll back the upgrade on the bastion host details page. After the rollback starts, the status of the bastion host changes to **Rolling back edition**.

  After the rollback, the basion host will restore to what it is before the upgrade. Data changes and new data will be lost as the basion host will be interrupted during the rollback. Exercise caution when performing this operation.

⚠ CAUTION

- If you plan a scale-out task after an upgrade, start the scale-out task 5 minutes later when the upgrade is finished.
- A scheduled upgrade must be set at least one day before the actual upgrade time. You are advised to upgrade the service during idle hours.
- To upgrade the service to the latest version, version 3.3.37.0 and earlier must be upgraded to 3.3.37.5 first, and versions 3.3.38.0 to 3.3.50.0 must be upgraded to 3.3.50.3 first.
- Manual rollbacks cannot be performed during a minor version upgrade (upgrading version 3.3.37.0 or earlier to 3.3.37.5, or upgrading any version between 3.3.38.0 and 3.5.50.0 to 3.3.50.3).
- If a scheduled upgrade is set, you cannot shut down, restart, change, or expand the capacity of the basion host.
- Before the upgrade starts, you can cancel the scheduled upgrade and reset the upgrade time.
- During the cross-version upgrade, you can manually roll back the version.
- There is a seven-day retention period for cross-version upgrades. You can roll back a cross-version upgrade within seven days after the upgrade. No rollbacks are allowed once the retention period expires. So, you need to verify the upgrade in a timely manner.
- If specification change or scale-out tasks are performed after an upgrade, no rollbacks can be performed. So, do not perform any specification change or scale-out operations until you verify the upgrade.
- After a successful cross-version upgrade, the instance ID, server ID, instance version, and creation time will change.
- During cross-version upgrade, ports 80, 8080, 443, and 2222 are automatically enabled for the instance. If you do not need to use these ports, disable them immediately after the upgrade.
- During cross-version upgrade, ports 22, 31036, 31679, and 31873 are automatically enabled for the instance. After the upgrade, keep prot 31679 enabled and disable other ports immediately if you do not need to use them.
- If a web certificate has been imported for an instance, import the certificate again after the cross-version upgrade for the instance.

Constraints

- In the new version of CBH, the application publish function is optimized. After the upgrade, to use the application O&M functions as usual, install the required plug-in on the application publish server as prompted. For details, see **Installing RemoteApp Program**.
- To upgrade version 3.3.40.0 and 3.3.41.0, synchronize the time of OBS buckets first.

- In the current version, all instances cannot be upgrade without service interruption. During the upgrade, services need to be suspended.

Prerequisites

- The CBH system data has been backed up.

  Before you upgrade, back up the CBH system data in the event of upgrade failures. For details, see **Which Types of System Data Can Be Backed Up in the CBH System?**

Procedure

Step 1 Log in to the management console.

Step 2 Locate the row containing the instance you want to upgrade. In the **Operation** column, choose **More** > **Upgrade** > **Upgrade Edition**.

Step 3 In the displayed dialog box, select the schedule upgrade time and enter **UPGRADE** to confirm. To cancel the upgrade schedule, enter **CANCEL** in the dialog box. You can also change the upgrade schedule you set before.

> NOTE
>
> Upgrade types:
>
> - During a minor version upgrade, the CBH instance you are using will be interrupted. It takes about 15 to 30 minutes to complete the upgrade.
> - During the cross-version upgrade, a new CBH instance will be created, and the CBH instance you are using will be interrupted. It takes about 30 minutes to 2 hours to complete the upgrade. During the cross-version upgrade, the instance status changes to **Upgrading** first, and then to **Migrating data**, **Configuring HA**, and to **Running**.

Step 4 Wait for the upgrade to complete. It takes about 15 minutes to 2 hours for the upgrade to finish at the backend. The actual upgrade time varies depending on the upgrade type. Once the upgrade starts, the instance status changes to **Upgrading**.

Step 5 When the CBH instance status changes to **Running**, the CBH system is available.

> NOTE
>
> After the upgrade completes, you can verify the upgrade. To do so, click the instance name in the **Instance Name** column. On the displayed page, check the instance version. If the instance version has not changed, the upgrade fails. In this case, contact technical support.

For details about how to query the version of the upgraded CBH system, see **Device System** in **About System**.

----End

1.8 Starting a CBH Instance

The instance needs to be started in the following scenarios:

- After a CBH instance is stopped, its **Status** changes to **Stopped**. To log in to the mapped CBH system again, start the instance.
- If a CBH instance is abnormal, its **Status** changes to **Abnormal**. To log in to the mapped CBH system again, try starting the instance.

Procedure

Step 1 Log in to the management console.

Step 2 Locate the row containing the instance you want to start. In the **Operation** column, click **Start**.

Step 3 In the displayed dialog box, click **OK**.

After the instance is started, its **Status** changes to **Running**.

----End

1.9 Stopping a CBH Instance

You can stop an instance in the **Running** status. After the instance is stopped, you cannot log in to the CBH system.

Procedure

Step 1 Log in to the management console.

Step 2 Locate the row containing the instance you want to stop. In the **Operation** column, choose **More** > **Stop**.

Step 3 In the displayed dialog box, click **OK**. After the CBH instance is stopped, its **Status** changes to **Stopped**.

> NOTE
>
> To forcibly stop an instance, select the **Forcibly stop** check box in the displayed dialog box. Forcibly stopping an instance may cause data loss. Ensure that all data files have been saved before performing this operation.

----End

1.10 Restarting a CBH Instance

If your CBH system becomes abnormal, you can try restarting the mapped CBH instance.

- You can restart a CBH instance in the **Running** status.
- Restarting a CBH instance will interrupt services of the mapped CBH system for about 5 minutes. During this period, the instance status is **Restarting**.
- The CBH system will be unavailable when the mapped CBH instance is being restarted.

Procedure

Step 1 Log in to the management console.

Step 2 Locate the row containing the instance you want to restart. In the **Operation** column, choose **More** > **Restart**.

Step 3 In the displayed dialog box, click **OK**.

The restart process usually takes about 5 minutes. During the restart, the CBH instance will be in the **Restarting** status.

The restart may take a longer time if both the CBH instance version upgrade and capacity expansion are performed.

When the CBH instance status changes to **Running**, the CBH system is available.

NOTE

> To forcibly restart a CBH instance, select the **Forcibly restart** check box. Forcibly stopping an instance may cause data loss. Ensure that all data files have been saved before performing this operation. Be sure no operations are performed in the mapped CBH system.

----End

1.11 Changing a VPC for a CBH Instance

This topic describes how to change the VPC your CBH instance belongs to on the CBH console. Provisioning your CBH instances and other projects in the same VPC will make communications between them more secure and stable.

Constraints

- The CBH instances must be in the **Running** status.
- At least three IP addresses are required in the VPC subnet you will use.
- The CBH instance version must be V3.3.52.0 or later.

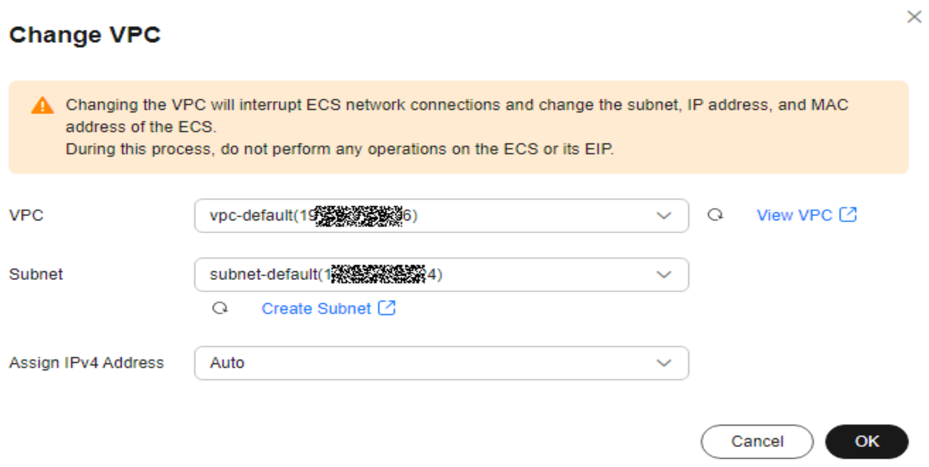
Procedure

Step 1 Log in to the management console.

Step 2 Locate the row that contains the target instance. In the **Operation** column, choose **More** > **Configure Network** > **Change VPC**.

Step 3 In the dialog box displayed, specify **VPC** and **Subnet**.

Figure 1-6 Change VPC



Change VPC

Changing the VPC will interrupt ECS network connections and change the subnet, IP address, and MAC address of the ECS.
During this process, do not perform any operations on the ECS or its EIP.

VPC: vpc-default(19[redacted]6)

Subnet: subnet-default(1[redacted]4)

Assign IPv4 Address: Auto

NOTE

After changing the VPC, you need to remove the CBH instance from the original VPC subnet, or the subnet will still be used.

----End

1.12 Changing Security Groups

A security group is a logical group. It provides access control policies for the ECSs and CBH instances that are trustful to each other and have the same security protection requirements in a VPC.

To ensure CBH instance security and reliability, configure security group rules to allow specific IP addresses and ports to access the resources. However, if you select an inapplicable security group when purchasing a bastion host, you cannot allow access from these IP addresses and ports by configuring security group rules. In this case, change the security group to meet your O&M requirements.

Constraints

- A CBH instance can be added to a maximum of five security groups.
- The CBH instances must be in the **Running** status.
- If a CBH instance is added to multiple security groups, rules of all security groups are applied to the instance.

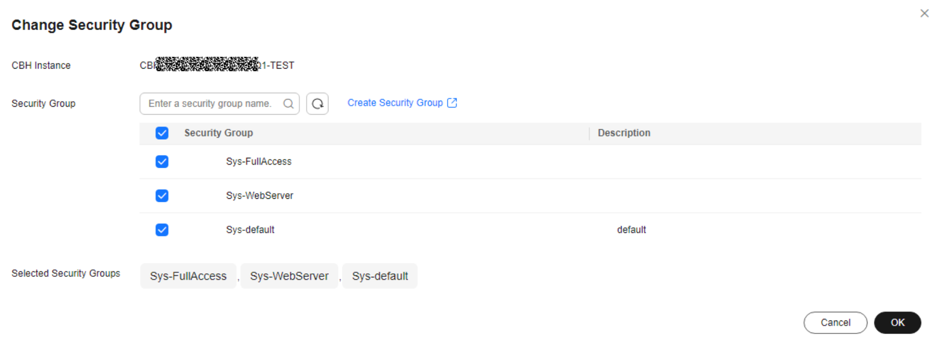
Procedure

Step 1 Log in to the management console.

Step 2 Locate the row that contains the target instance. In the **Operation** column, choose **More** > **Configure Network** > **Change Security Group**.

Step 3 In the displayed dialog box, select the security group you want to configure for the instance.

Figure 1-7 Change Security Group



Change Security Group

CBH Instance: CB[redacted]1-TEST

Security Group: Enter a security group name.

☑ Security Group	Description
☑ Sys-FullAccess	
☑ Sys-WebServer	
☑ Sys-default	default

Selected Security Groups: Sys-FullAccess , Sys-WebServer , Sys-default

Step 4 Click **Yes**.

----End

1.13 Binding an EIP to a CBH Instance

An EIP must be bound to a CBH instance if you want to perform any of the following operations (the minimum EIP bandwidth is 5 Mbit/s):

- Log in to the CBH system using a web browser. URL: https:// *EIP of the CBH instance*, for example, *https://10.10.10.10*.
- If the mobile SMS login is configured, you need to obtain the verification code through the mobile phone. If the EIP is not configured, you cannot receive SMS messages.
- Interconnect with LTS to send logs. For details, see **Configuring LTS**.
- In V3.3.2.0 and earlier versions, if no EIPs are bound to a CBH instance, operations such as changing the version specifications, upgrading the version, and starting or restarting the instance will fail.

Constraints

When binding an EIP to a CBH instance, the operation can be done on the CBH console only. Otherwise, you cannot log in to the CBH instance using IAM.

Prerequisites

- You have purchased at least one elastic IP address (EIP).

⚠ CAUTION

- An EIP can be bound to only one cloud resource. A CBH instance cannot share an EIP with other cloud resources.
- The same account must be used to purchase CBH instances and EIPs to be bound to them, and the instances and EIPs must be in the same region.

Procedure

Step 1 Log in to the management console.

Step 2 Locate the row containing the instance to which you want to bind an EIP. In the **Operation** column, choose **More** > **Configure Network** > **Bind EIP**.

Step 3 In the displayed dialog box, select an EIP in the **Unbound** status and click **OK**.

After the binding is successful, the **Login** button will be enabled. You can check the bound EIP in the **EIP** column.

NOTE

If no EIPs are available, create one. For details, see **EIP Overview**.

----End

1.14 Unbinding an EIP from a CBH Instance

To bind another EIP to a CBH instance or release an EIP that has been bound to a CBH instance, unbind the EIP from the instance first. After the EIP is unbound from the CBH instance, this EIP cannot be used to log in to the CBH system.

Procedure

Step 1 Log in to the management console.

Step 2 Locate the row containing the instance from which you want to unbind an EIP. In the **Operation** column, choose **More** > **Configure Network** > **Unbind EIP**.

Step 3 In the displayed dialog box, click **OK**.

After the EIP is unbound, no IP address is displayed in the **EIP** column, and the **Login** button is disabled.

----End

1.15 Allowing Access to Cloud Assets

CBH has been interconnected with Cloud Secret Management Service (CSMS) and Key Management Service (KMS), making it easier for you to use managed credentials on CBH.

Procedure

Step 1 Log in to the management console.

Step 2 Click **Cloud Asset Authorization** in the upper right corner.

Step 3 In the displayed dialog box, switch to in the **Operation** column to enable the authorization.

Step 4 For details about how to add a resource account, see **Adding Accounts of Managed Host or Application Resources into Your Bastion Host**.

----End

1.16 Managing Tags

You can use tags to manage resources in batches. For resources you want to manage them hierarchically, you can use keys and values. For common resources, you can use only keys.

Adding a Tag

Step 1 Log in to the management console.

Step 2 Click the name of the target instance to go to its details page.

Step 3 In the **Tag** area, click **Add Tag**. In the dialog box displayed, enter a tag key and value.

NOTE

- A tag key cannot start with _sys_, and cannot start or end with a space. But UTF-8 letters, digits, spaces, and the following characters are allowed: _.:=+-@
- A tag value can contain only UTF-8 letters, digits, spaces, and the following characters: _.:=+-@
- It is recommended that you use TMS's predefined tag function to add the same tag to different cloud resources.

Step 4 Confirm the information and click **OK**.

----End

Editing a Tag

Step 1 Log in to the management console.

Step 2 Click the name of the target instance to go to its details page.

Step 3 Click **Edit** in the **Operation** column of the target tag and edit the tag value.

Step 4 Confirm the information and click **OK**.

----End

Deleting a Tag

Step 1 Log in to the management console.

Step 2 Click the name of the target instance to go to its details page.

Step 3 Click **Delete** in the **Operation** column of the target tag.

Step 4 Confirm the deletion and click **OK**.

----End

1.17 Key CBH Instance Operations Recorded by CTS

1.17.1 CBH Operations Supported by CTS

Cloud Trace Service (CTS) records operations on cloud resources in your account. You can use the logs to perform security analysis, track resource changes, audit compliance, and locate faults.

After CTS is enabled, the system starts to record CBH operations. You can view operation records generated in the latest seven days on the CTS console. **Table 1-5** lists the CBH instance operations that can be recorded by CTS.

Table 1-5 CBH instance operations

Operation	Resource Type	Trace Name
Creating a CBH	cbh	createInstance
Deleting a CBH	cbh	deleteInstance
Restarting a CBH	cbh	rebootCBH
Starting a CBH	cbh	startCBH
Stopping a CBH	cbh	stopCBH
Submitting a CBH order	cbh	subscribeOrder
Updating a CBH order	cbh	updateCloudServiceType
Updating CBH metadata	cbh	updateMetadata
Querying the job synchronization	cbh	jobsAsynQuery
Upgrading a CBH instance	cbh	upgradeInstance
Changing specifications of a CBH instance	cbh	alterInstanceSpec
Rolling back a CBH instance	cbh	rollbackInstance
Resetting the Admin password	cbh	resetPassword
Resetting login method for user **Admin**	cbh	resetLoginMethod
Changing network settings for a CBH Instance	cbh	changeNetworkOfCBH

1.17.2 Viewing CTS Traces

After CTS is enabled, the system starts recording operations of CBH. Operation records for the last seven days can be viewed on the CTS console.

Procedure

Step 1 Log in to the management console.

Step 2 Click 📍 in the upper left corner and select a region and project.

Step 3 Under **Management & Governance**, click **Cloud Trace Service**.

Step 4 On the left navigation pane, choose **Trace List**.

Step 5 Specify the filters used for querying traces. The following filters are available:

- **Trace Source**, **Resource Type**, and **Search By**
  - Select a search criteria from the drop-down list box. For example, choose **CBH** > **cbh** > **Trace Name** > **createInstance**, and click **Query** to query all instance creation operations.
  - **Trace Name**: Select a trace name, for example, **createInstance**.
  - **Resource ID**: Select or manually enter the ID of a CBH instance whose logs are to be viewed.
  - **Resource Name**: Select or manually enter the name of a CBH instance whose logs are to be viewed.
- **Operator**: Select a specific operator (a user rather than tenant).
- **Trace Status**: Available options include **All trace statuses**, **normal**, **warning**, and **incident**. You can only select one of them.
- You can specify start time and end time query traces during a time period.

Step 6 Click ⌄ on the left of the trace to be queried to extend its details.

Step 7 Click **View Trace** in the **Operation** column for details.

----End

2 Logging In to the CBH System

2.1 Overview

You can log in to your bastion host in local, IAM, or admin login mode. In local or IAM login mode, use the accounts as required. In admin login mode, you can log in to a bastion host as user **admin** without entering passwords.

If you have logged in to your bastion host using the current browser, you need to log out of the current account before logging in to the instance using another account.

Port Requirements

To use a bastion host for resource management, ensure that the communication between the the bastion host and the managed resources is enabled. Before you start, check whether your network ACL configuration allows access to the bastion host and configure the security group of the bastion host by referring to **Table 2-1**.

⚠ CAUTION

- During cross-version upgrade, ports 80, 8080, 443, and 2222 are automatically enabled for the instance. If you do not need to use these ports, disable them immediately after the upgrade.
- During cross-version upgrade, ports 22, 31036, 31679, and 31873 are automatically enabled for the instance. After the upgrade, keep prot 31679 enabled and disable other ports immediately if you do not need to use them.

Table 2-1 Inbound and outbound rule configuration reference

Scenario Description	Direction	Protocol/ Application	Port
Accessing a bastion host through a web browser (HTTP and HTTPS)	Inbound	TCP	80, 443, and 8080
Accessing a bastion host through Microsoft Terminal Services Client (MSTSC)	Inbound	TCP	53389
Accessing a bastion host through an SSH client	Inbound	TCP	2222
Accessing a bastion host through FTP clients	Inbound	TCP	20~21
Remotely accessing Linux ECSs of a bastion host over SSH clients	Outbound	TCP	22
Remotely accessing Windows ECSs of a bastion host over the RDP Protocol	Outbound	TCP	3389
Accessing Oracle databases through a bastion host	Inbound	TCP	1521
Accessing Oracle databases through a bastion host	Outbound	TCP	1521
Accessing MySQL databases through a bastion host	Inbound	TCP	33306
Accessing MySQL databases through a bastion host	Outbound	TCP	3306
Accessing SQL Server databases through a bastion host	Inbound	TCP	1433
Accessing SQL Server databases through a bastion host	Outbound	TCP	1433
Accessing DB databases through a bastion host	Inbound	TCP	50000
Accessing DB databases through a bastion host	Outbound	TCP	50000
Accessing GaussDB databases through a bastion host	Inbound	TCP	18000
Accessing GaussDB databases through a bastion host	Outbound	TCP	18000
License servers	Outbound	TCP	9443

Scenario Description	Direction	Protocol/ Application	Port
Cloud services	Outbound	TCP	443
Accessing a bastion host system through the SSH client in the same security group	Outbound	TCP	2222
SMS service	Outbound	TCP	10743 and 443
Domain name resolution service	Outbound	UDP	53
Accessing PGSQL databases through a bastion host	Inbound	TCP	15432
Accessing PGSQL databases through a bastion host	Outbound	TCP	5432

Verification Type

You can use remote Active Directory (AD), Remote Authentication Dial In User Service (RADIUS), Lightweight Directory Access Protocol (LDAP), Security Assertion Markup Language (SAML), and Azure AD authentication methods. You can use existing user passwords on any of those remote servers for identity verification.

Table 2-2 Authentication methods

Verification Type	Authentication Description
Local Authentication	Static passwords configured for the system are used for identity verification. ● Multifactor verification can be configured for users authenticated by static password. ● You can reset or change the static passwords. If you forgot this password, you can find it back through email.
AD domain authentication	The passwords of users on the AD server are used for identity verification. ● Multifactor verification can be configured for users authenticated by static password. ● Passwords cannot be changed through the bastion host.

Verification Type	Authentication Description
RADIUS Authentication	The passwords of users on the RADIUS server are used for identity verification. ● Multifactor verification can be configured for users authenticated by static password. ● Passwords cannot be changed through the bastion host.
LDAP Authentication	The passwords of users on the LDAP server are used for identity verification. ● Multifactor verification can be configured for users authenticated by static password. ● Passwords cannot be changed through the bastion host.
Azure AD authentication	The passwords of Microsoft accounts are used for identity verification. The login page is redirected to the Microsoft Azure login page for you to provide credentials. ● Multifactor verification cannot be configured for users authenticated by the Azure AD server. ● Passwords cannot be changed through the bastion host.
SAML authentication	The passwords of users on the SAML server are used for identity verification. ● Multifactor verification can be configured for users authenticated by static password. ● Passwords cannot be changed through the bastion host.

Logon Type

Different login methods require different credentials. If multifactor verification is enabled, the static password login method becomes invalid.

Table 2-3 Login method description

Logon Type	Login Description
Password	Enter the username and password of your bastion host.
Mobile SMS Authentication	Enter the username and password of your bastion host, click **Send Code**, and enter the SMS verification code you will receive.
Mobile OTP	Enter the username and password first, and then enter the mobile one-time password (OTP).

Logon Type	Login Description
USBKey	Insert your USB key into your terminal device, select the issued USB key, and enter the corresponding personal identification number (PIN).
One-time Passwords (OTPs)	Enter the username and password first, and then enter the verification code displayed on your OTP token device.

2.2 Using a Web Browser to Log In to Your Bastion Host

You can use mainstream browsers to log in to your bastion host for system management and resource O&M. Web browsers are recommended for system administrator **admin** or other administrators to manage the system and audit authorization.

Browser-based logins can be authenticated by password, SMS message, mobile OTP, USB key, or OTP token.

NOTE

- First-time login users are required to bind a mobile number for password resetting.
- You can select **Local Login**, **IAM Login** (available in V3.3.44.0 or later), or **Admin Login** (available in V3.3.52.1 or later, but not supported by Kunpeng PBH). If you select **IAM Login** or **Admin Login**, no password is required.

Prerequisites

An EIP has been bound to your bastion host.

Procedure

Step 1 Enter the IP address of your bastion host in the address box of your browser to access the login page.

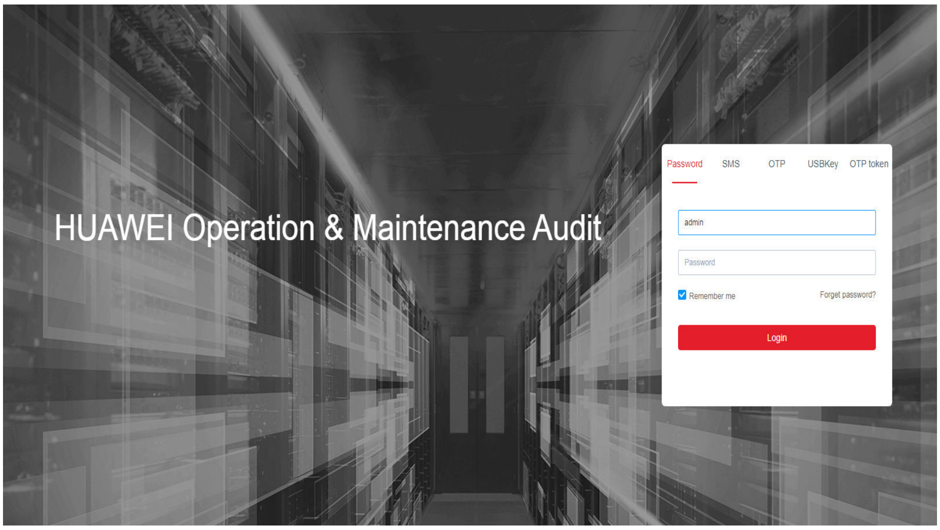
URL: https:// *EIP of your bastion host*, for example, *https://10.10.10.10*.

NOTE

Use supported browsers to access your bastion host. In an incompatible browser, the login verification message may fail to be sent to you, or exceptions may occur after you log in. For recommended browsers, see **Restrictions on Using a Bastion Host**.

Step 2 Select a login authentication method.

Figure 2-1 Bastion host system login page



Step 3 Enter credentials required by the login method you chose.

The following content walks you through how to log in to your bastion host using different authentication methods.

----End

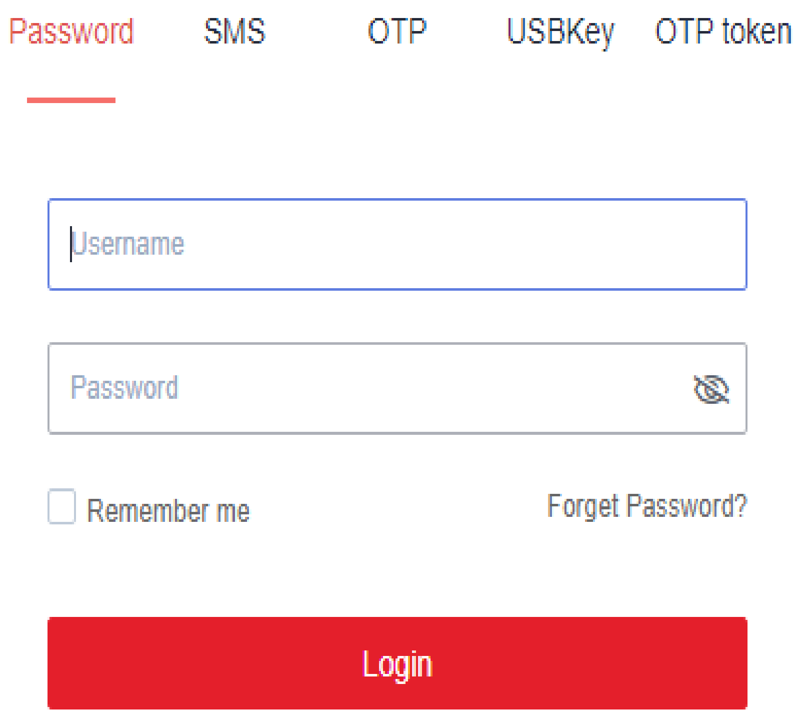
Using Static Passwords for Logging

Step 1 Select **Password**.

Step 2 Enter the username and password of your account.

Step 3 Click **Login**.

Figure 2-2 Password authentication



----End

Using SMS Verification for Logging

Before you start, ensure that your mobile number can receive SMS messages.

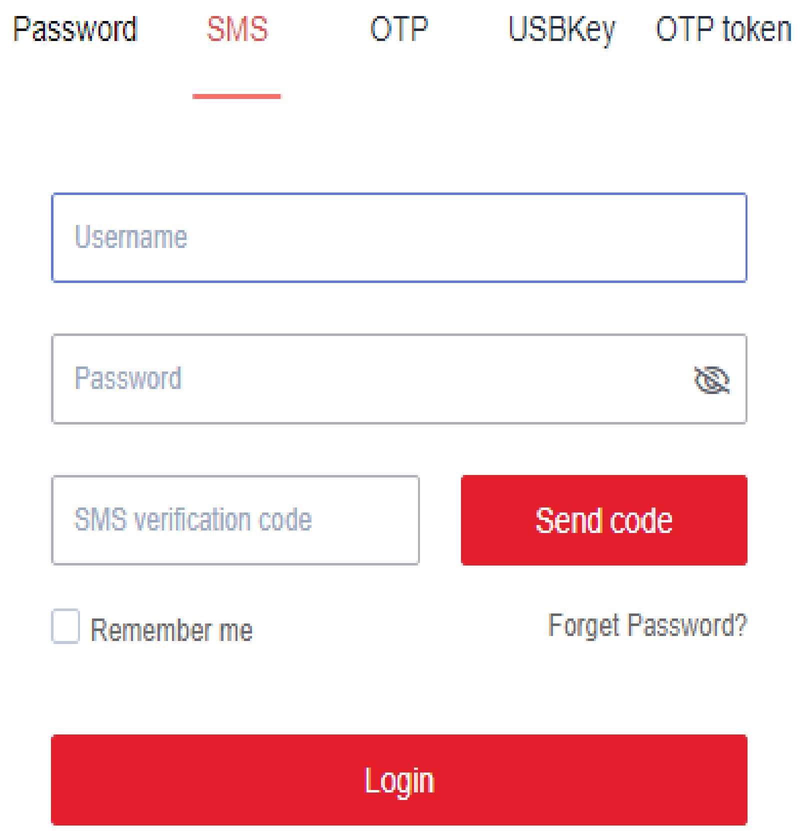
Step 1 Select **SMS**.

Step 2 Enter the username and password of your PBH account.

Step 3 Click **Send code** and enter the 6-digit OTP token in the received SMS message.

Step 4 Click **Login**.

Figure 2-3 SMS authentication



----End

Using Mobile OTPs for Logging

Before your start, ensure that the time on your mobile phone must be the same as that in your bastion host, accurate to seconds.

NOTICE

The mobile phone token applet for your bastion host is stored in the applet cache. The applet cache may be cleared mistakenly in the background.

It is recommended that you save the QR code image when applying for a mobile phone token. If the preceding situation occurs, scan the QR code again.

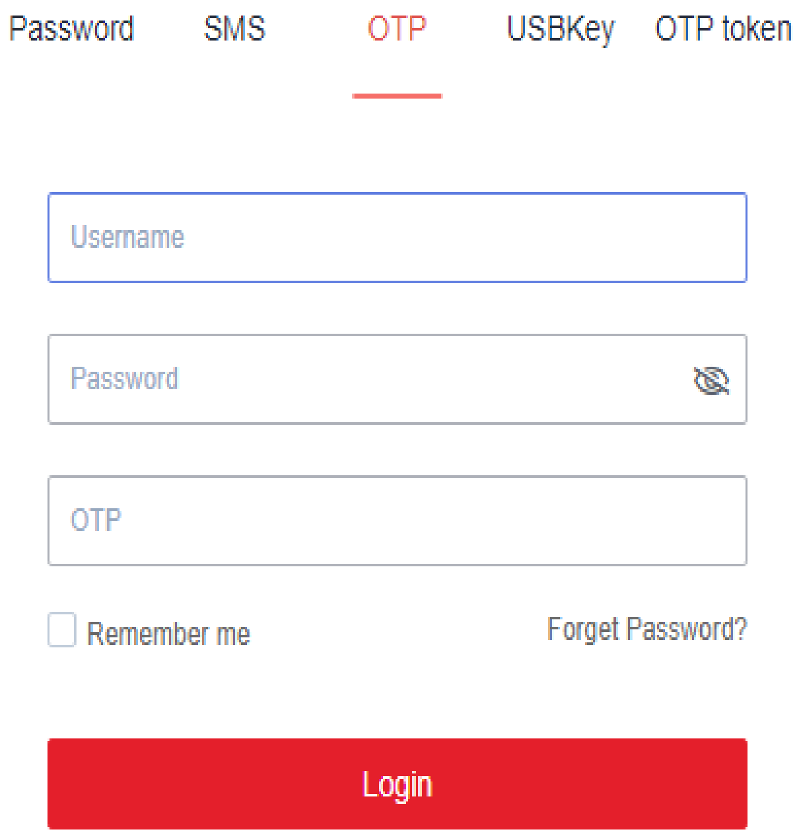
Step 1 Select **OTP**.

Step 2 Enter the username and password of your account.

Step 3 Start the token client on your mobile phone, obtain the 6-digit OTP, and enter it in the **OTP** text box.

Step 4 Click **Login**.

Figure 2-4 OTP authentication



----End

Login Through USB Key Authentication

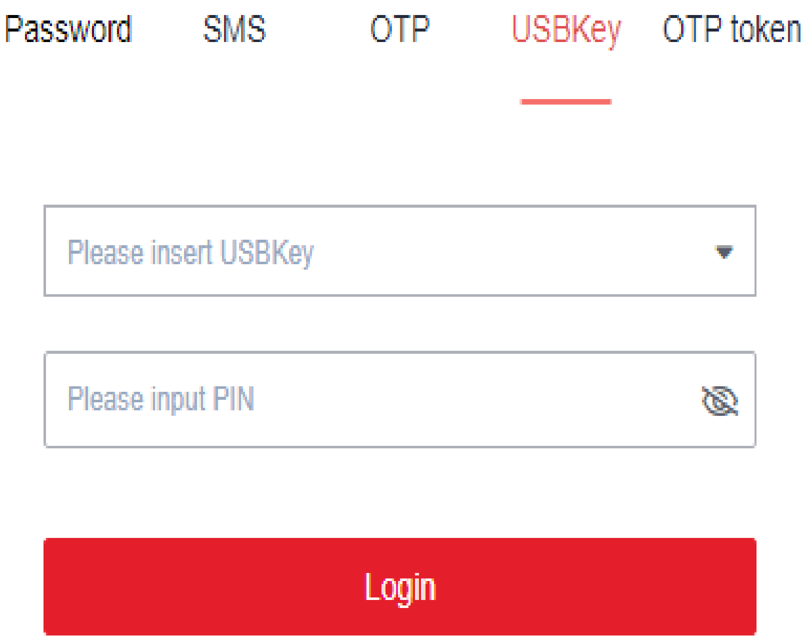
Step 1 Select **USBKey**.

Step 2 Insert your USB key. The bastion host automatically identifies the USB key.

Step 3 Enter the PIN code displayed on your USB key.

Step 4 Click **Login**.

Figure 2-5 USB key authentication



----End

Using OTP Tokens for Logging

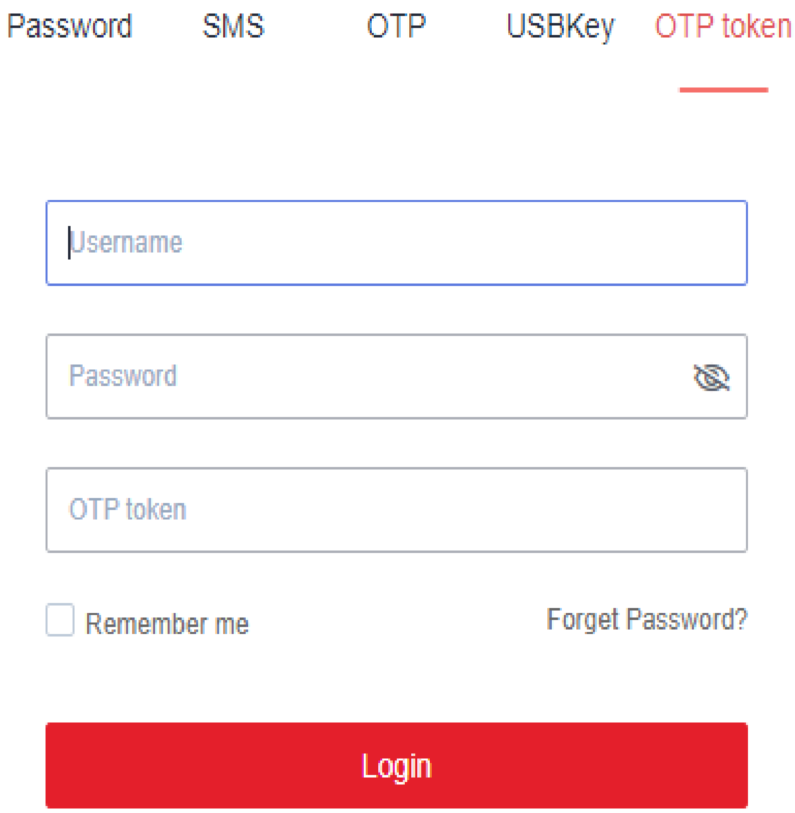
Step 1 Select **OTP token**.

Step 2 Enter the username and password of your account.

Step 3 Obtain the 6-digit OTP from the issued hardware token and enter it in the **OTP token** text box.

Step 4 Click **Login**.

Figure 2-6 OTP token authentication



----End

Login Through Azure AD Authentication

Step 1 Click the Azure AD login link to go to the Microsoft Azure login page.

Step 2 Enter the username and password of your Microsoft Azure account as prompted.

NOTE

Your login name must contain the email address suffix, for example, zhang@example.com.

Step 3 Click **Login**.

----End

2.3 Using a Client to Log In to Your Bastion Host

Your current client-based operation experience is still useful while using a bastion host for operations. Through your bastion host, you can use an SSH or Microsoft Terminal Services Client (MSTSC) client to directly log in to managed resources for operations.

- SSH client logins can be authenticated by static passwords, public keys, SMS messages, mobile OTPs, or OTP tokens.
- MSTSC client logins can only be authenticated by static passwords.

- SecureCRT 8.0 or later and Xshell 5 or later are recommended.

Using an SSH Client to Log In to Your Bastion Host

CBH allows you to use an SSH client to log in to your CBH system for authorized resource O&M.

- Only host resources configured with the SSH, Telnet, or Rlogin protocols can be logged in through an SSH client.
- SecureCRT 8.0 or later and Xshell 5 or later are recommended.

Step 1 Start the local SSH client tool and choose **File** > **New** to create a user session.

Step 2 Configure user session connection.

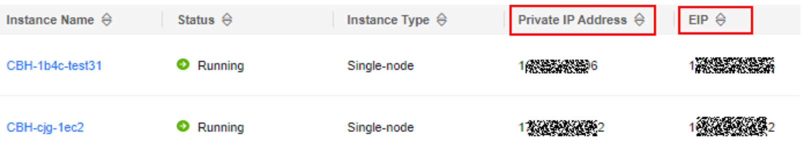
- Method 1

  In the displayed dialog box, select a protocol type, enter the EIP address and port number (2222) of the CBH instance, and click **OK**. Enter the login name of your CBH system account and click **Connect**.

- Method 2
  - In the newly opened blank session window, run a command in the following format: ***Protocol type User login name@System login IP address Port number***, for example, ssh admin@10.10.10.10 2222. After the login, select the target server.
  - In a newly opened blank session window, run a login command: ***{Protocol type} {Bastion host user login name}@{Host account username}@{Linux host IP address}@{Bastion host IP address} {Port}***. For example, you can run **ssh admin@10.10.10.10@10.10.10.101 2222** to log in to the target server.
- Method 3
  - In a newly opened blank session window, run a login command: ***{Protocol type} {User login name}@{System login IP address}* -p *{Port number}***, for example, **ssh admin@10.10.10.10 2222**. After the login, select the target server.
  - In a newly opened blank session window, run a login command: ***{Protocol type} {Bastion host user login name}@{Host account username}@{Linux host IP address}@{Bastion host IP address}* -p *{Port}***. For example, you can run **ssh admin@10.10.10.10@10.10.10.101 -p 2222** to log in to the target server.

NOTE

system login IP address indicates the private IP address or EIP of your bastion host. Make sure the network connection between the local PC and the IP address is normal.



Instance Name	Status	Instance Type	Private IP Address	EIP
CBH-1b4c-test31	Running	Single-node	[redacted]	[redacted]
CBH-cjg-1ec2	Running	Single-node	[redacted]	[redacted]

Step 3 Authenticate user identities.

Enter your identity credentials as prompted.

When an SSH client is used for establishing connections, you can use the **Password**, **SSH Pubkey**, **SMS**, **Mobile OTP**, and/or **OTP Token** authentication. To use **SMS**, **Mobile OTP**, and **OTP token**, configure multifactor verification. For details, see **Configuring Multifactor Verification**.

Table 2-4 SSH client login authentication

Authentication Method	Login Description	Configuration Description
Password	Enter the username and password of your bastion host account.	Default login mode. The login passwords in the **AD**, **RADIUS**, **LDAP**, or **Azure AD** authentication are the passwords of users on the remote server. For details, see **Remote Authentication Management**.
SSH Pubkey	Enter the private key and private key password for login authentication. After the login authentication is successful, next time the user can log in to the system over the SSH client without entering the password.	You need to generate a public and private key pair for login verification and add the SSH public key to your bastion host in the **Profile** center. For details, see **Adding an SSH Public Key**.
SMS	In **SMS** authentication, enter the **Password** or **SSH Pubkey** and the SMS verification code you will receive to complete the login authentication.	An available phone number has been configured for the account.
Mobile OTP	In **Mobile OTP** authentication, enter the **Password** or **SSH Pubkey** and the OTP token to complete the login authentication. **NOTE** Ensure that the CBH system time is the same as the mobile phone time (accurate to the second). Otherwise, a message indicating that the verification code is incorrect will be reported.	Bind your system user account to a mobile OTP and contact the administrator to configure multi-factor authentication for this account. For details, see **Mobile OTP**.
OTP token	After the **Password** or **SSH Pubkey** login is authenticated, select **OTP token** and enter the verification code.	An OTP token has been issued to the user. For details, see **Issuing an OTP Token**.

Step 4 After logging in to your bastion host, you can view system information and start O&M operations.

NOTE

You can also use APIs to log in to resources managed by a bastion host. To do so, you need to obtain the specific URL.

----End

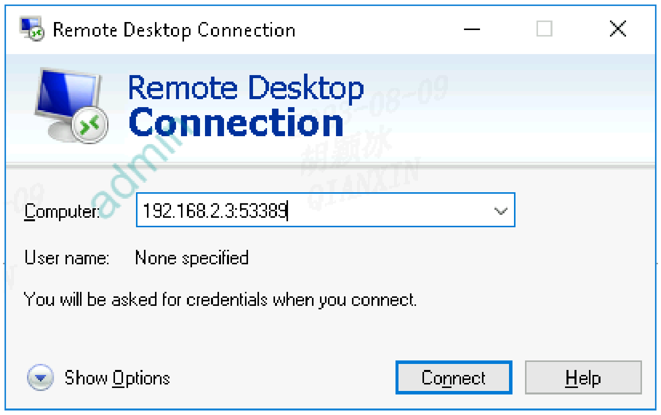
Accessing Your Bastion Host through MSTSC

CBH allows you to use a Microsoft Terminal Services Client (MSTSC) client to log in to authorized resources for O&M.

Step 1 Open the MSTSC dialog box.

Step 2 In the displayed dialog box, enter your bastion host information in the **Computer** text box in the format of *Bastion host IP address*: **53389**.

Figure 2-7 Configuring the computer



Computer: 192.168.2.3:53389

User name: None specified

You will be asked for credentials when you connect.

Step 3 Click **Connect** and provide the following information to complete the login:

- Username: Enter *Login Name of the CBH user@Windows host resource account@Windows host resource IP address:Windows remote port* (3389 by default), for example, admin@Administrator@192.168.1.1:3389.

  NOTE

  The *Windows host resource account* must be a resource account that has been added to CBH and the login mode must be automatic login, or the resource account cannot be identified and O&M audit files cannot be generated. Real-time session O&M is not supported.

- **Password**: Enter the password of the CBH user.

----End

2.4 Configuring Multifactor Verification

2.4.1 Configuring SMS Login Authentication

You can configure a mobile phone to receive a 6-digit code for login identity verification. In SMS authentication method, both the static login password and a 6-digit SMS verification code are required for login.

Constraints

- Only one phone number can be bound to a system user account.
- You have enabled the SMS gateway IP address and port 10743 and port 443 for the security group of the bastion host instance, and the bastion host system can access the SMS gateway.

Step 1: Bind a Phone Number

The phone number bound to a user account must be valid and can receive SMS messages.

Method 1: Binding a phone number as an individual system user

Step 1 Log in to your bastion host using your static password.

Step 2 On the **Dashboard** page, click the user name in the upper right corner and choose **Profile**.

Step 3 In the displayed **Profile** management page, click **Edit**.

Step 4 In the displayed **Edit Basic Info** dialog box, enter a valid phone number in the **Mobile** text box.

Step 5 Click **OK**.

----End

Method 2: Changing a user's phone number as the administrator

Step 1 Log in to your bastion host as the administrator.

Step 2 Choose **User** > **User** to go to the **User** management page.

Step 3 Select a user and click its **LoginName**.

Step 4 On the displayed page, click **Edit** in the **Basic Info** area.

Step 5 Enter a valid phone number in the **Mobile** text box.

Step 6 Click **OK**.

----End

Step 2: Configure SMS Authentication as the Administrator

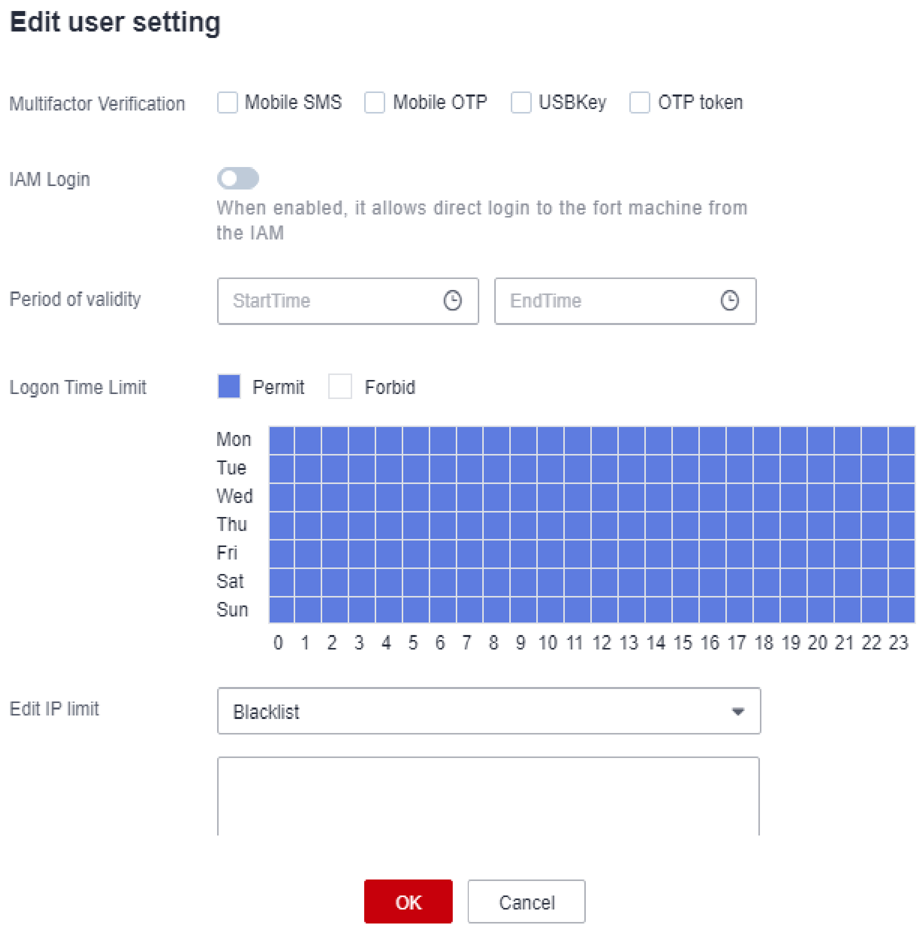
Step 1 Log in to your bastion host as the administrator.

Step 2 Choose **User** > **User** to go to the **User** management page.

Step 3 Select a user and click its **LoginName**.

Step 4 In the **User Setting** area, click **Edit**.

Figure 2-8 Editing user setting



Edit user setting

Multifactor Verification ☐ Mobile SMS ☐ Mobile OTP ☐ USBKey ☐ OTP token

IAM Login ○

When enabled, it allows direct login to the fort machine from the IAM

Period of validity StartTime EndTime

Logon Time Limit 🟦 Permit ☐ Forbid

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Mon	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦
Tue	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦
Wed	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦
Thu	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦
Fri	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦
Sat	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦
Sun	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦

Edit IP limit Blacklist

Step 5 In the displayed **Edit user setting** dialog box, select **Mobile SMS** for **Multifactor Verification**.

Step 6 Click **OK**.

The next time the user logs in to the system, they will have to provide an SMS code.

----End

2.4.2 Configuring Mobile OTP Login Authentication

A mobile OTP is a mobile application that can generate a dynamic password for identity verification. In mobile OTP verification method, both your static login password and a 6-digit one-time password are required for login.

NOTICE

If you want to enable MFA for the **admin** account, you need to configure the mobile phone token first, or the **admin** account cannot log in to the system in MFA mode.

Currently, built-in mobile OTPs and Remote Authentication Dial In User Service (RADIUS) mobile OTPs are supported.

- Built-in mobile OTP: WeChat applet OTP
- RADIUS mobile OTP applications: Microsoft Authenticator, Google Authenticator, and FreeOTP

Constraints

Ensure that your bastion host and mobile phone have the same system time, accurate to the seconds. Otherwise, the system may prompt that the mobile OTP fails to be bound.

Synchronize the bastion host system time to the mobile phone time. Refresh the page, scan the new QR code, and try again.

Step 1: Bind a Mobile OTP as a Common User

Step 1 Log in to your bastion host using your static password.

Step 2 On the **Dashboard** page, click the user name in the upper right corner and choose **Profile**.

Step 3 On the displayed **Profile** page, click the **Mobile OTP** tab.

On the displayed page, follow the instructions to bind a mobile OTP.

NOTE

If you do not have the WeChat app, use the Google verification code program to scan the second QR code.

Step 4 (Optional) To unbind the mobile OTP, click **Unbind** on the **Mobile OTP** tab.

----End

Step 2: Enable Mobile OTP Authentication for a User as the Administrator

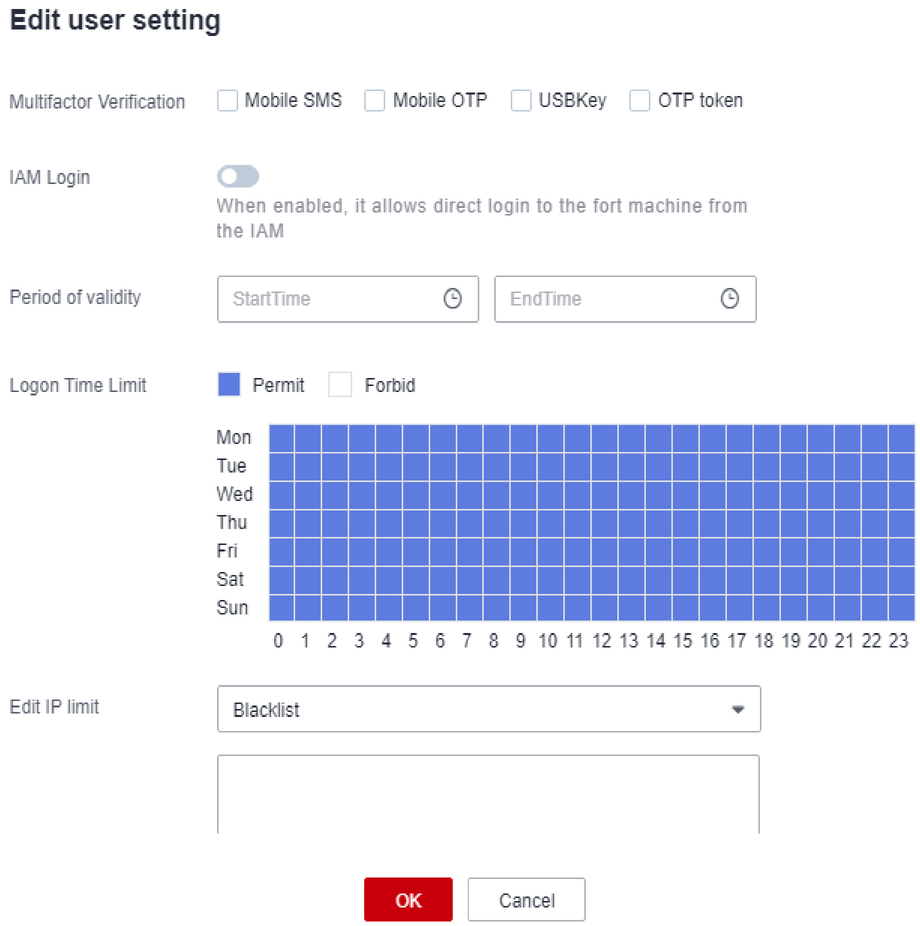
Step 1 Log in to your bastion host as the administrator.

Step 2 Choose **User** > **User** to go to the **User** management page.

Step 3 Select a user having mobile OTP bound and click its **LoginName**.

Step 4 In the **User Setting** area, click **Edit**.

Figure 2-9 Editing user setting



Edit user setting

Multifactor Verification □ Mobile SMS □ Mobile OTP □ USBKey □ OTP token

IAM Login

When enabled, it allows direct login to the fort machine from the IAM

Period of validity StartTime EndTime

Logon Time Limit 🟦 Permit □ Forbid

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Mon	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦
Tue	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦
Wed	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦
Thu	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦
Fri	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦
Sat	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦
Sun	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦

Edit IP limit Blacklist

Step 5 In the displayed **Edit user settings** dialog box, select **Mobile OTP** for **Multifactor Verification**.

Step 6 Click **OK**.

The next time the user logs in to the system, they will have to provide a mobile OTP.

----End

2.4.3 Configuring USB Key Login Authentication

USB token is a one-time password technology implemented based on USB keys. In USB key authentication method, you will need to insert the USB key into your local host for login. The system login page then automatically identifies the inserted USB key and requires you to enter the corresponding PIN to pass identity authentication.

Constraints

- Currently, USB keys of Century Longmai (GM3000), Century Longmai-SM series algorithms (GM3000), and Feitian (ePass3000GM) are supported. USB keys from different vendors cannot identify each other for login authentication. Configure your vendor before enabling this authentication method. For details, see **Configuring USB Keys**.

- A USB key can be issued to one user only.

Prerequisites

You have obtained a USB key and installed the USB key driver locally.

Step 1 Configure USB Key Authentication

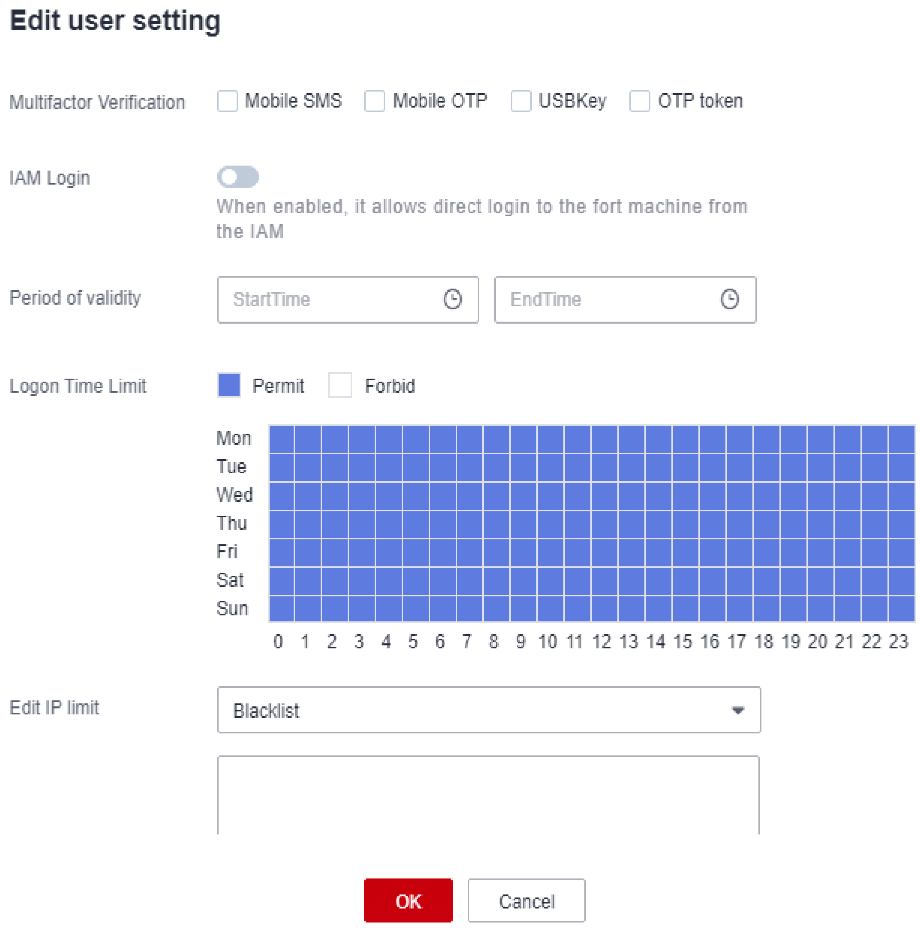
Step 1 Log in to your bastion host as the administrator.

Step 2 Choose **User** > **User** to go to the **User** management page.

Step 3 Select a user and click its **LoginName**.

Step 4 In the **User Setting** area, click **Edit**.

Figure 2-10 Editing user setting



Edit user setting

Multifactor Verification □ Mobile SMS □ Mobile OTP □ USBKey □ OTP token

IAM Login ○
When enabled, it allows direct login to the fort machine from the IAM

Period of validity StartTime EndTime

Logon Time Limit ■ Permit □ Forbid

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Mon	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Tue	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Wed	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Thu	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Fri	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Sat	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Sun	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Edit IP limit Blacklist

Step 5 In the displayed **Edit user setting** dialog box, select **USBKey** for **Multifactor Verification**.

Step 6 Click **OK**.

----End

Step 2: Issue the USBKey

Step 1 Log in to your bastion host as the administrator.

Step 2 Choose **User** > **USBKey** in the navigation pane.

Step 3 Click **Issue** to issue a USB key.

Step 4 Select a user with the USB key multifactor verification enabled as the related user.

Table 2-5 Parameters for issuing a USB key

Parameter	Description
USBKey	Specifies the USB key ID.
Relate User	Specifies the user to which the USB key is related. USB key in multifactor verification must be enabled for such users.
PIN	Specifies the personal identification number (PIN) uniquely corresponding to the USB key. It is provided by the USB key vendor.

Step 5 Click **OK**. You can then view the newly issued USB key in the USB key list.

When logging in to a bastion host with a USB key, insert your USB key into your local host, select the USB key on the login page, and enter the PIN as prompted. The USB key is identified automatically when it is inserted.

----End

2.4.4 Configuring OTP Token Login Authentication

An OTP token is a security hardware device that generates one-time passwords. You can use event-based OTP tokens. In OTP token authentication method, both your static login password and a 6-digit one-time password generated by your hardware are required for login.

Constraints

- Currently, bastion hosts support only Jansh ETZ201/ETZ203 OTP tokens.
- A hardware OTP token can be issued only to one user.

Prerequisites

You have obtained a hardware token.

Step 1: Configure OTP Token Authentication

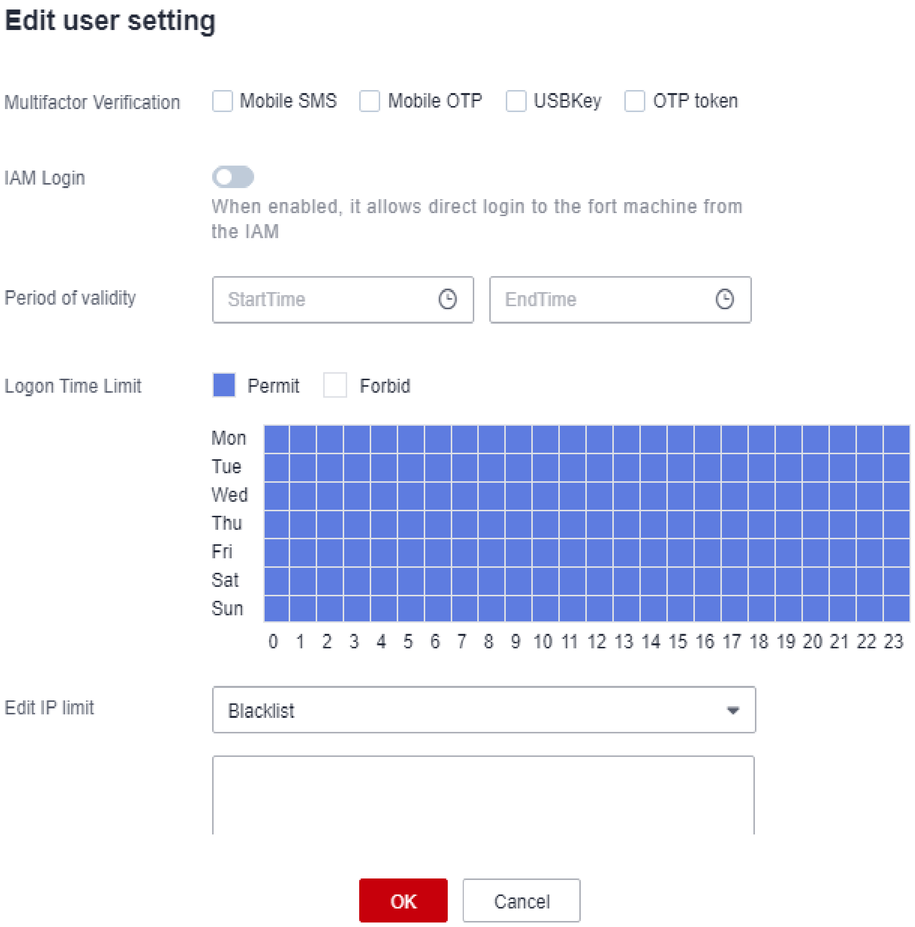
Step 1 Log in to your bastion host as the administrator.

Step 2 Choose **User** > **User** to go to the **User** management page.

Step 3 Select a user and click its **LoginName**.

Step 4 In the **User Setting** area, click **Edit**.

Figure 2-11 Editing user setting



Edit user setting

Multifactor Verification □ Mobile SMS □ Mobile OTP □ USBKey □ OTP token

IAM Login ○

When enabled, it allows direct login to the fort machine from the IAM

Period of validity: StartTime – EndTime

Logon Time Limit ■ Permit □ Forbid

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Mon	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Tue	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Wed	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Thu	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Fri	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Sat	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Sun	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Edit IP limit: Blacklist

Step 5 In the displayed **Edit user setting** dialog box, select **OTP token** for **Multifactor Verification**.

Step 6 Click **OK**.

----End

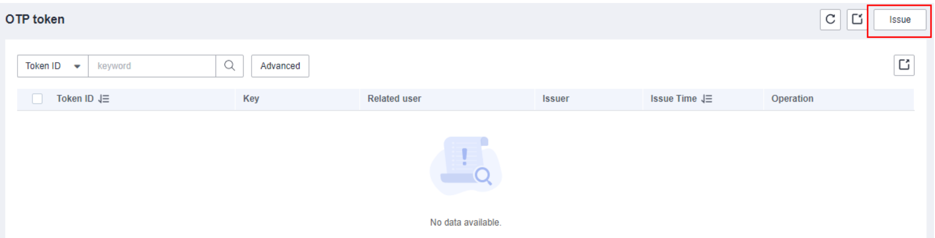
Step 2: Issue an OTP Token

Step 1 Log in to your bastion host as the administrator.

Step 2 Choose **User** > **OTP token** in the navigation pane.

Step 3 Click **Issue** to issue an OTP token.

Figure 2-12 Issuing an OTP token



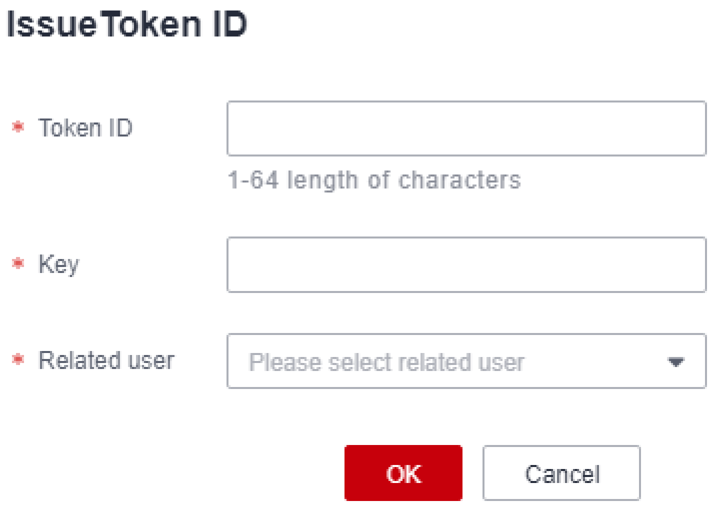
OTP token

□ Token ID	Key	Related user	Issuer	Issue Time	Operation

No data available.

Step 4 Enter the required token information.

Figure 2-13 Issue Token ID



IssueToken ID

* Token ID

1-64 length of characters

* Key

* Related user

Please select related user

Table 2-6 Parameters for issuing an OTP token

Parameter	Description
Token ID	Specifies the OTP token ID.
Key	Specifies the key uniquely corresponding to the OTP token. It is provided by the OTP token vendor.
Relate User	User who the OTP token is related to.

Step 5 Click **OK**. You can view the newly issued OTP token in the OTP token list.

In the OTP token authentication method, the login page requires the login name, static password, and the dynamic OTP issued by your hardware token.

----End

2.5 Managing Login Security

2.5.1 Configuring User Login Lockout

To harden login security, the source IP address, or the combination of the user account and source IP address, or user account will be locked out if the number of consecutive invalid password attempts exceeds the configured threshold.

This topic describes how to configure the user login lockout, including changing the lockout method, lockout duration, and maximum login attempts.

Prerequisites

You have the management permissions for the **System** module.

Procedure

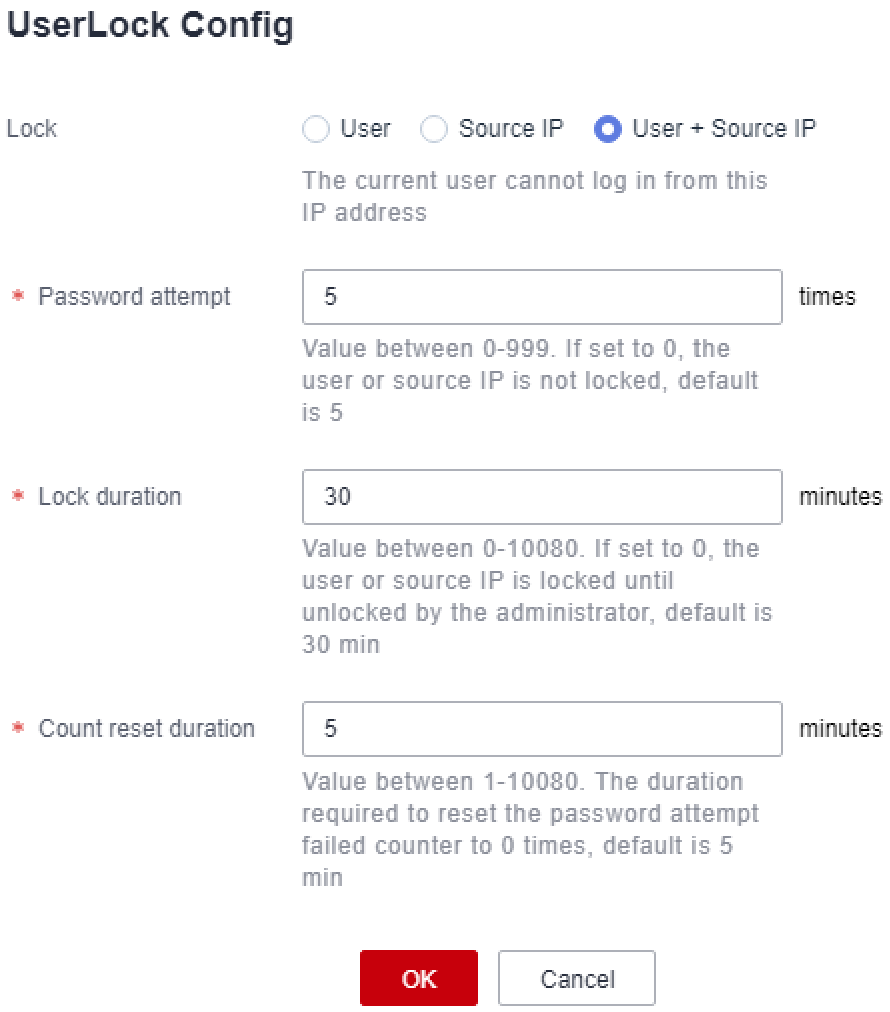
Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Security**.

Step 3 In the **UserLock Config** area, click **Edit**.

Complete configurations as prompted.

Figure 2-14 UserLock Config



UserLock Config

Lock ○ User ○ Source IP ● User + Source IP

The current user cannot log in from this IP address

* Password attempt 5 times

Value between 0-999. If set to 0, the user or source IP is not locked, default is 5

* Lock duration 30 minutes

Value between 0-10080. If set to 0, the user or source IP is locked until unlocked by the administrator, default is 30 min

* Count reset duration 5 minutes

Value between 1-10080. The duration required to reset the password attempt failed counter to 0 times, default is 5 min

Table 2-7 Parameters for configuring user lockout

Parameter	Description
Lock	User lock mode. You can select **User + Source IP, User**, or **Source IP**. ● **User**: If the number of consecutive failed password attempts exceeded the upper limit, the user is blocked by the system. ● **Source IP**: If the number of consecutive failed password attempts exceeded the upper limit, the source IP address is blocked by the system. ● **User + Source IP**: If the number of consecutive failed password attempts exceeded the upper limit, the login name and source IP address are blocked by the system.
Password attempt	Allowed maximum number of consecutive failed password attempts. ● Default value: **5** ● Value range: **0** to **999** ● If this parameter is set to **0**, the user account will not be locked out even if the password is incorrect.
Lock duration	Lockout duration ● Default value: **30** minutes ● Value range: **0** to **10080**, in minutes ● If this parameter is set to **0**, the user account or source IP address will be locked out unless the administrator unlocks it.
Count reset duration	Duration after which the number of login failures is reset to **0**. ● Default value: **5** minutes ● Value range: **1** to **10080**, in minutes

Step 4 Click **OK**. You can then check the lockout configuration of the current system user on the **Security** tab.

----End

2.5.2 Configuring the Login Password Policies

This topic describes how to configure the user password policies, including the password strength, number of password verification times, and password change period.

Prerequisites

You have the management permissions for the **System** module.

Procedure

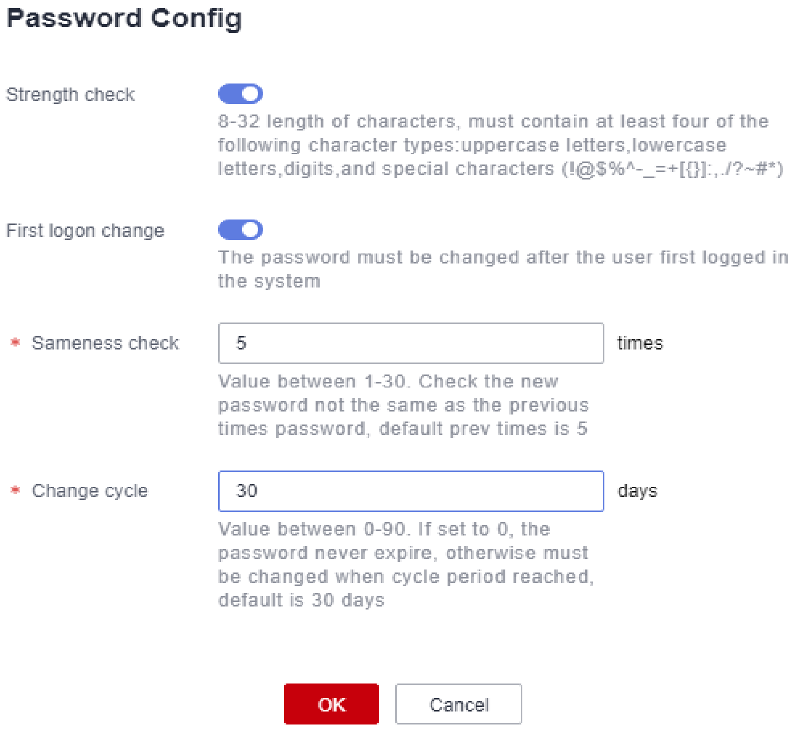
Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Security**.

Step 3 In the **Password Config** area, click **Edit**.

Complete configurations as prompted.

Figure 2-15 Password Config



Password Config

Strength check ◉
8-32 length of characters, must contain at least four of the following character types:uppercase letters,lowercase letters,digits,and special characters (!@$%^-_=+[{}]:,./?~#*)

First logon change ◉
The password must be changed after the user first logged in the system

* Sameness check: 5 times
Value between 1-30. Check the new password not the same as the previous times password, default prev times is 5

* Change cycle: 30 days
Value between 0-90. If set to 0, the password never expire, otherwise must be changed when cycle period reached, default is 30 days

Table 2-8 Parameters for configuring a password policy

Parameter	Description
Strength check	Checks password strength. It is enabled (◉) by default. ● ○: disabled ● ◉: The password can contain 8 to 32 characters and must contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters !@$%^-_=+[{}]:,./?~#*.
First logon change	Forces a user to change password upon first login to the system. It is enabled (◉) by default. ● ○: disabled. ● ◉: enabled.
Sameness check	Prohibits the reuse of the latest *N* passwords. ● The password used for initial login is not counted. ● Default value: **5** ● Value range: **1** to **30**

Parameter	Description
Change cycle	Password validity period. Users will be forced to change their passwords upon expiry. ● Default value: **30** days ● Value range: **0** to **90**, in days ● If the value is **0**, the password never expires.

Step 4 Click **OK**. You can then check the password policy of the current system user on the **Security** tab.

----End

2.5.3 Configuring Web Login Timeout and Authentication

This topic describes how to configure the timeout and authentication settings for logins through web browsers, including login timeout duration, SMS verification code validity period, graphic verification code, SSH public key login, and SSH password login.

Prerequisites

You have the management permissions for the **System** module.

Configuring Web Login Requirements

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **System Config** > **Security**.

Step 3 In the **Web Login Config** area, click **Edit**.

Complete configurations as prompted.

Table 2-9 Parameters for configuring web login

Parameter	Description
Idle timeout	Duration to wait before an inactive user is logged out. After a system user logs in to a bastion host through a web browser, if they have no operations for a period longer than the configured idle timeout, they will be logged out. ● Default value: **30** minutes ● Value range: **1** to **43200**, in minutes
SMS duration	SMS verification code validity period. ● Default value: **60** seconds ● Value range: **60** to **3,600**, in seconds ● If the value is **0**, the SMS verification code never expires.

Parameter	Description
Captcha	Whether to use the CAPTCHA technology for graphic verification. The options are **Enable**, **Disable**, and **Auto**. ● **Enable**: A graphic verification code is required for every login. ● **Disable**: No graphic verification code is required for logins. ● **Auto**: A graphic verification code is required when the number of consecutive failed password attempts exceeds the configured login attempts.
Login attempts	If the number of consecutive failed password attempts exceeds the login attempts, the graphic verification is automatically enabled. ● This parameter is mandatory if **Captcha** is set to **Auto**. ● Default value: **3** ● Value range: **1** to **30**
Captcha duration	Validity period of a CAPTCHA. ● Default value: **60** seconds ● Value range: **15** to **3600**, in seconds ● If the value is **0**, the graphic verification code never expires.
Domain Check	Whether to check domain. This option is disabled by default (○). ● ●: enabled. If you select the AD domain authentication, you are required to download an SSO client and use the same login name as that registered with the AD domain server for logins. ● ○: disabled
Source IP Check	Whether to check source IP address. The default status is ○. ● ●: The **Source IP Check** is enabled. If this function is enabled, your bastion host obtains the source IP address of the access request from the TCP connection details. When the system finds that the source IP address changes, it disconnects the current session and requires the user to log in again. ● ○: The **Source IP Check** is disabled. If this function is disabled, the session is not disconnected when the source IP address changes. **NOTE** – A basion host will record every source IP address no matter whether **Source IP Check** is enabled. – If you are logged out over and over again due to IP address changes after enabling **Source IP Check**, you can disable it. There are no impacts on your using of the bastion host. – Only V3.3.44.0-S and later versions support this function.

Parameter	Description
Not Allow Multipoint Login	After this function is enabled, the same bastion host does not allow login from multiple addresses or devices.
Keep Client Session	To enable or disable this function, you need to enable **Not Allow Multipoint Login** first. ● Disabled: When system users access the bastion host through the web page, the sessions of the logged-in clients are forcibly disconnected. If they log in to the bastion host through the same client, the sessions of the logged-in clients cannot be forcibly disconnected. ● Enabled: After this function is enabled, when system users access the bastion host through the web page, the client session that has been logged in to is not forcibly disconnected. The client session is retained, and logins through web page is disabled.

Step 4 Click **OK**. You can then check the web login configuration of the current system on the **Security** tab.

----End

Configuring Login Using a Client

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **System Config** > **Security**.

Step 3 In the **Client Login Config** area, click **Edit**.

Complete configurations as prompted.

Table 2-10 Parameters for configuring client login

Parameter	Description
Idle timeout	Duration to wait before an inactive user is logged out of the bastion host SSH client. ● Default value: **30** minutes ● Value range: **1** to **43200**, in minutes
Logon with SSH key	Whether to enable SSH key login authentication (Default: ○). ● ●: enabled. If you have configured an SSH public key, you can log in to the system using the SSH client without providing passwords. ● ○: disabled.

Parameter	Description
Logon with password	Whether to enable SSH password login authentication (Default: ○). ● ●: enabled ● ○: disabled ● If both **Logon with SSH key** and **Logon with password** are enabled, the SSH key login authentication is preferentially performed.

Step 4 Click **OK**. You can then check the client login configuration of the current system on the **Security** tab.

----End

2.5.4 Updating a System Web Certificate

A web certificate for a bastion host is a Secure Sockets Layer (SSL) server digital certificate issued by a trusted root certificate authority (CA). The certificate is used to verify the website identity and secure connections.

A secure self-issued certificate is configured for each bastion host by default, but this certificate takes effect only within certain scope and period. You can replace it with your own certificate.

This topic describes how to update the system certificate if it expires or fails a security check.

Prerequisites

- You have purchased and downloaded an SSL certificate.
- The domain name the uploaded certificate is used for has been resolved to the EIP bound to the bastion host. For details, see **Adding an A Record Set**.
- You have the management permissions for the **System** module.

Constraints

- Currently, only the Java Keystore certificate file of Tomcat, that is, the certificate file in .jks is supported.
- A certificate file cannot exceed 20 KB and must contain a certificate password.

  When you upload an SSL certificate, provide its password for verification, or the upload will fail.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Security**.

Step 3 In the **Web Certificate** configuration area, click **Edit**.

Step 4 Upload the certificate file downloaded in your computer.

Step 5 After the certificate file is uploaded, enter the Keystore password to verify the certificate.

Step 6 Click **OK**. You can then check the web certificate configuration of the current system user on the **Security** tab.

Step 7 Restart the bastion host for the updated certificate to take effect.

----End

2.5.5 Configuring the Mobile OTP Type

A mobile OTP application is a software token application used to generate a dynamic password on a bound mobile phone. In mobile OTP verification method, a password and a 6-digit mobile OTP verification code are required for logging in to a bastion host.

This topic describes how to set the mobile OTP type.

Constraints

- Currently, only the following OTP types are supported:
  - Built-in mobile OTP: WeChat applet OTP
  - RADIUS mobile OTP: OTP applications, including Google Authenticator and FreeOTP
- For the mobile token to take effect, ensure that the mobile token types configured in the system and on your mobile phone are the same.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Security**.

Step 3 In the **Mobile Token Settings** area, click **Edit**.

Step 4 In the displayed **Mobile Token Settings** dialog box, select a mobile OTP type.

Step 5 Click **OK**. You can then check the mobile token settings of the current system user on the **Security** tab.

----End

2.5.6 Configuring the USB Key Vendor

This topic describes how to configure the USB key vendor.

Constraints

- Currently, only the USB keys from Century Longmai, Century Longmai (SM series cryptographic algorithms), and Feitian Technologies are supported.

- If you change the vendor of a USB key, the issued USB key cannot be identified by the system.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Security**.

Step 3 In the **USB Key Settings** area, click **Edit**.

Step 4 In the displayed dialog box, select a vendor.

Step 5 Click **OK**. You can then check the USB key settings of the current system on the **Security** tab.

----End

2.5.7 Configuring Policies to Disable Zombie Users (Available in V3.3.30.0 and Later Versions)

The zombie user policy function allows you to identify zombie users and customize a threshold time range. If a user does not log in to the system within the configured threshold time range, the system marks the user as zombie and disables the user. Only the administrator can enable the zombie user. The default threshold is 30 days. If the threshold is set to 0, all users are disabled immediately.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Security**.

Step 3 In the **UserDisabled Config** area, click **Edit**.

- **Disable zombie users**: By default, this function is disabled. After this function is enabled, the status is .
- **Determines the zombie user time**: The value ranges from 0 to 10,080. The default value is 30 days. If the value is set to 0, all users are disabled immediately until the administrator cancels the disabling. For details about how to enable users, see **Enabling or Disabling a User**.

Step 4 Click **OK**.

----End

2.5.8 Configuring the RDP Resource Client Proxy (Available in 3.3.26.0 and Later Versions)

This topic describes how to configure the RDP resource client proxy.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Security**.

Step 3 In the **RDP resource client proxy Configuration** area, click **Edit**.

Step 4 In the **Security layer** drop-down list, select a client proxy and click **OK**.

You can select **RDP**, **TLS**, or **Negotiate**.

----End

2.5.9 Enabling API Configuration (Included in V3.3.34.0 and Later Versions Only).

After you enable the API configuration, you can use your bastion host by calling APIs.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Security**.

Step 3 In the **API Config** area, click **Edit**.

Step 4 Click ○ .

Step 5 Click **OK**.

----End

2.5.10 Configuring Automatic Inspection (Available in V3.3.36.0 and Later)

After automatic inspection is enabled, the system automatically verifies accounts of managed resources at 01:00 on the 5th, 15th, and 25th days of each month.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Security**.

Step 3 In the **Auto Inspect Config** area, click **Edit**.

Step 4 By default, automatic inspection is enabled. You can click to disable it.

Step 5 Click **OK**.

----End

2.5.11 Configuring a Resource Account

If you enable resource accounts, the Empty account is automatically added.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Security**.

Step 3 On the right of resource account configuration, click **Edit** to go to the configuration page.

Step 4 The **Empty** account is automatically added and enabled by default (). You can disable it if needed.

Step 5 Click **OK**.

----End

2.5.12 Configuring Client Login

You can set an idle limit to trigger automated logout. If a user does not perform any actions within the idle limit, the user will be logged out.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Security**.

Step 3 On the right of the **Client Login Config** bar, click **Edit**. The **Client Login Config** dialog box is displayed.

Step 4 Enter a timeout for logging out idle users and select the SSH login mode. **Table 2-11** describes the parameters.

Table 2-11 Configuring Client Login

Parameter	Description	Example Value
Idle timeout	Duration to wait before an inactive user is logged out. Value range: 1 to 43,200 After a system user logs in to a bastion host through a web browser, if they have no operations for a period longer than the configured idle timeout, they will be logged out. The default value is 30 minutes.	30
Logon with SSH key	Whether to enable SSH key login authentication for users that have been logged out after idle timeout. This function is enabled by default.	●
Logon with password	Whether to enable SSH password authentication for users that have been logged out after idle timeout. This function is enabled by default.	●

Step 5 Click **OK**.

----End

2.5.13 Configuring a User Expiration Reminder

You can configure a user validity period reminder. Then, the system will send an email reminder every day 5 days before the user validity period actually expires.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Security**.

Step 3 On the right of **User Expiration Countdown Settings**, click **Edit** to go to the configuration page.

Step 4 Set **User Password** and enable **User Expiration Countdown** (●).

Step 5 Click **OK**.

----End

2.5.14 Configuring Session Limit

You can enable session limit to deny new sessions when the CPU and memory usage exceeds the server configuration.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Security**.

Step 3 Click **Edit** on the right of **Session Limit Settings** to go to the configuration page.

Step 4 Set the status of **Session Limit** to ●, and set a threshold for CPU and memory usage. When the CPU or memory usage triggers the threshold, no new sessions will be established.

Step 5 Click **OK**.

----End

3 Dashboard of the CBH System

3.1 Dashboard

In a bastion host system, the **Dashboard** page presents the O&M information, system user actions, and host and application operations. The **Dashboard** module consists of a basic statistic area and 17 graph panels, including **Focus Resources**,**Online User**, **Tickets To Approve**, **Host Statistics**, **Application Statistics**, **Alive Sessions**, **Today Spawned Sessions**, **Logon Statistics**, **Operation Statistics**, **Top 5 of Operation User**, **Top 5 of Operation Host**, **System Status**, **System Info**, **Recently Logged Hosts**, **Recently Logged Apps**, **My Hosts**, and **My Apps**.

These panels are visible for you based on your roles. This topic uses the system administrator **admin** as an example to describe how to get information on the **Dashboard** page.

Procedure

Step 1 Log in to your bastion host.

Step 2 In the navigation tree on the left, choose Desktop. The Desktop Dashboard page is displayed.

Step 3 View different panels based on your needs. For details about the functions of each panel, see the following topics.

----End

Focus Resources

Displays statistics about users, hosts, applications, and application servers that can be managed by the current user, and the number of unprocessed alerts.

To view basic statistics, obtain the management permissions for **User**, **Host**, **Application**, and **Application Server** modules and the role management permissions. Otherwise, this panel will be invisible for you. In the basic statistics area, you can view:

- User information

  Displays the number of user accounts that can be managed. You can click this module to go to the user list page and manage the users.

- Hosts

  Displays the number of host resources that can be managed. You can click this module to go to the host list page and manage the host resources.

- **Application**

  Displays the number of application resources that can be managed. You can click this module to go to the application resource list page and manage the application resources.

- **AppServer**

  Displays the number of application servers that can be managed. You can click this module to go to the application server list page and manage the application servers.

- **Alert**

  Displays the number of unprocessed alarms. You can click this module to go to the message center page and manage messages.

Online User

Displays the online users and historical login users you can manage.

To view the statistics of online users, obtain the management permission of the **User** module and the role management permission.

Click a username in the list to go to the user details page. On this page, you can view and manage user information.

Tickets to Approve

Displays the tickets to be approved.

To view the tickets to be approved, obtain the management permission of the **Ticket Approval** module and the role management permission.

Click a ticket in the list to go to the ticket details page. On this page, you can view the ticket information and approve it with just one click.

Host Statistics

Displays the statistics on hosts you can manage.

To view the statistics of hosts, obtain the management permission of the **Host** module and the role management permission.

- Different color represents different host type. Move your cursor over a color block in the circle to view the number of hosts of a certain type.
- Click a color block to go to the corresponding host list page.

Application Statistics

Displays the statistics on application types you can manage.

To view the statistics of application resources, obtain the management permission of the **Application** module and the role management permission.

- Different color represents different host type. Move your cursor over a color block in the circle to view the number of application resources of a certain type.
- Click a color block to go to the corresponding application list page.

Alive Sessions

Displays the statistics on sessions you can manage.

To view the statistics of live sessions, obtain the management permission of the **Live Session** module and the role management permission.

You can click a live session type to go to the corresponding live session list page and monitor the session in real time.

Today Spawned Sessions

Displays the statistics on historical sessions you can manage.

To view the statistics of historical sessions, obtain the management permission of the **History Session** module and the role management permission.

You can click a history session type to go to the corresponding historical session list page and view historical sessions.

Logon Statistics

Displays the trend chart of the number of logins to the system by system users under your management. You can view the trend charts of the current week and month.

To view the statistics on logins, obtain the management permission of the **User** module and the role management permission.

- To view how many times the system is logged in within a certain day, move your cursor over the corresponding date.

Operation Statistics

Displays the trend chart of the number of logins to managed resources by system users under your management. You can view the trend charts of the current week and month.

To view the statistics on logins to resources, obtain the management permission of the **History Session** module and the role management permission.

To view how many times authorized resources are accessed through the bastion host within a certain day, move your cursor over the corresponding date.

Top 5 of Operation User

Displays top 5 system users with most login times to managed resources. You can view the trend charts of the current week and month.

To view the statistics on user login times to the managed resources, obtain the management permission of the **History Session** module and the role management permission.

Click a user in the list to go to the user details page. On this page, you can view and manage user information.

Top 5 of Operation Host

Displays top 5 mostly accessed resources. You can view the trend charts of the current week and month.

To view the statistics on managed resources, obtain the management permission of the **History Session** module and the role management permission.

Click a host resource in the list to go to the details page. On this page, you can view and manage resource information.

System Status

Displays the CPU, memory, and disk usage of the current system.

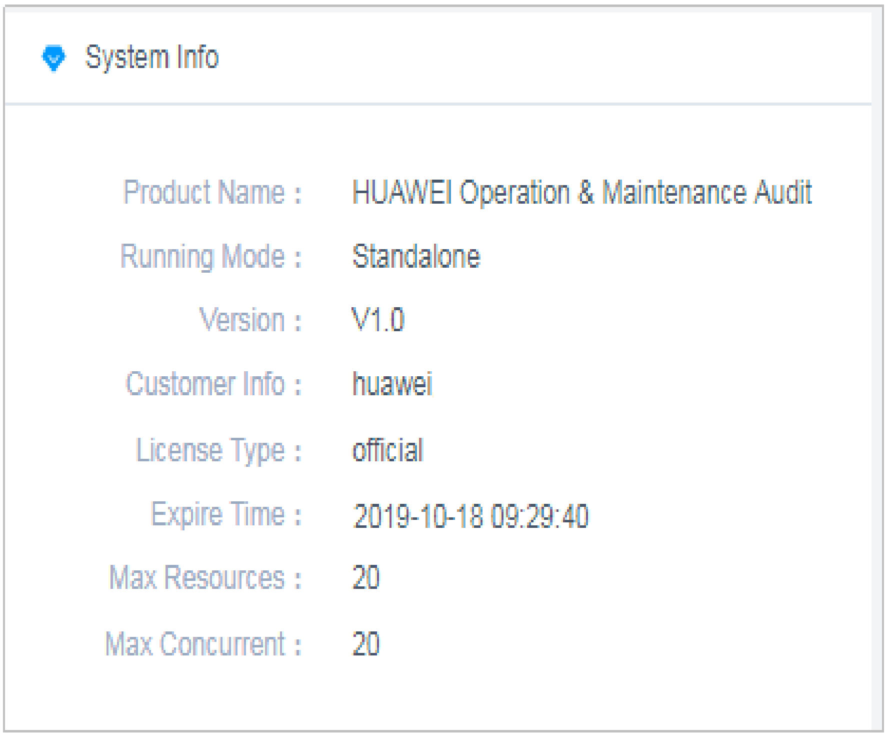
To view the statistics on system status, obtain the management permission of the **System** module and the role management permission.

System Info

Displays the basic information about the current system and the specifications of the authorized system version.

To view information about your bastion host, obtain the management permission of the **System** module and the role management permission.

Figure 3-1 System Info



System Info

Product Name :	HUAWEI Operation & Maintenance Audit
Running Mode :	Standalone
Version :	V1.0
Customer Info :	huawei
License Type :	official
Expire Time :	2019-10-18 09:29:40
Max Resources :	20
Max Concurrent :	20

Recently Logged Host

Lists the host resources you have logged in recently.

To view recently logged in hosts, obtain the management permissions for the **Host Operations** module.

- To view details about a host, click the host name in the list to go to the details page.
- To quickly log in to a host resource, click **Login** in the host row.

Recently Logged Application

Lists the application resources you have logged in recently.

To view recently logged in application resources, obtain the management permissions for the **App Operations** module.

- To view details about an application, click the application name in the list to go to the details page.
- To quickly log in to an application resource, click **Login** in the application row.

My Hosts

Displays host resources you are authorized to log in.

To view hosts that you can log in for operations, obtain the management permissions for the **Host Operations** module.

- To view details about a host, click the host name in the list to go to the details page.
- To quickly log in to a host resource, click **Login** in the host row.

My APPs

Displays the application resources that you are authorized to log in to.

To view application resources that you can log in for operations, obtain the management permissions for the **App Operations** module.

- To view details about an application, click the application name in the list to go to the details page.
- To quickly log in to an application resource, click **Login** in the application row.

3.2 Profile

3.2.1 Viewing Your Profile

On the **Profile** page, tabs **Profile**, **Mobile OTP**, **SSH Pubkey**, **My Permission**, and **My Log** are available for you to configure basic user information, user permissions, system usage logs, mobile one-time passwords (OTPs), and SSH public keys.

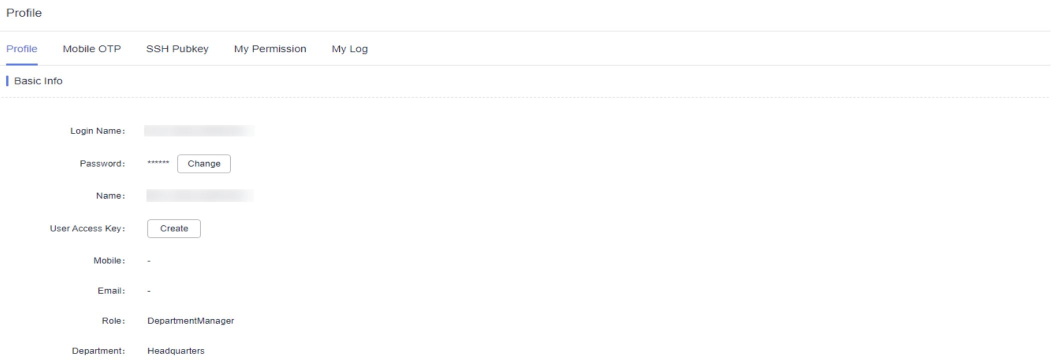
This topic walks you through how to view your profile.

Procedure

Step 1 Log in to your bastion host.

Step 2 On the **Dashboard** page, click the user name in the upper right corner and choose **Profile**.

Figure 3-2 Profile



Profile

Profile | Mobile OTP | SSH Pubkey | My Permission | My Log

Basic Info

Login Name: [redacted]

Password: ****** Change

Name: [redacted]

User Access Key: Create

Mobile: -

Email: -

Role: DepartmentManager

Department: Headquarters

Step 3 Click each tab to view the corresponding information.

You can view profile, mobile OTP, SSH public key, permission, and log information.

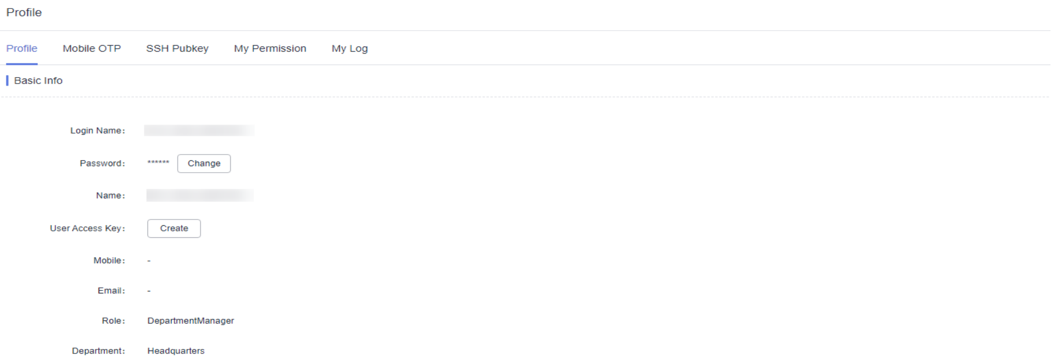
----End

Basic Info

Click the **Profile** tab to view basic user information, including the login name, ciphertext password, name, mobile number, email address, role, and department.

To change the mobile number, email address, and password, see **Editing Basic Information in Profile**.

Figure 3-3 Profile



Profile

Profile | Mobile OTP | SSH Pubkey | My Permission | My Log

Basic Info

Login Name: [redacted]

Password: ****** Change

Name: [redacted]

User Access Key: Create

Mobile: -

Email: -

Role: DepartmentManager

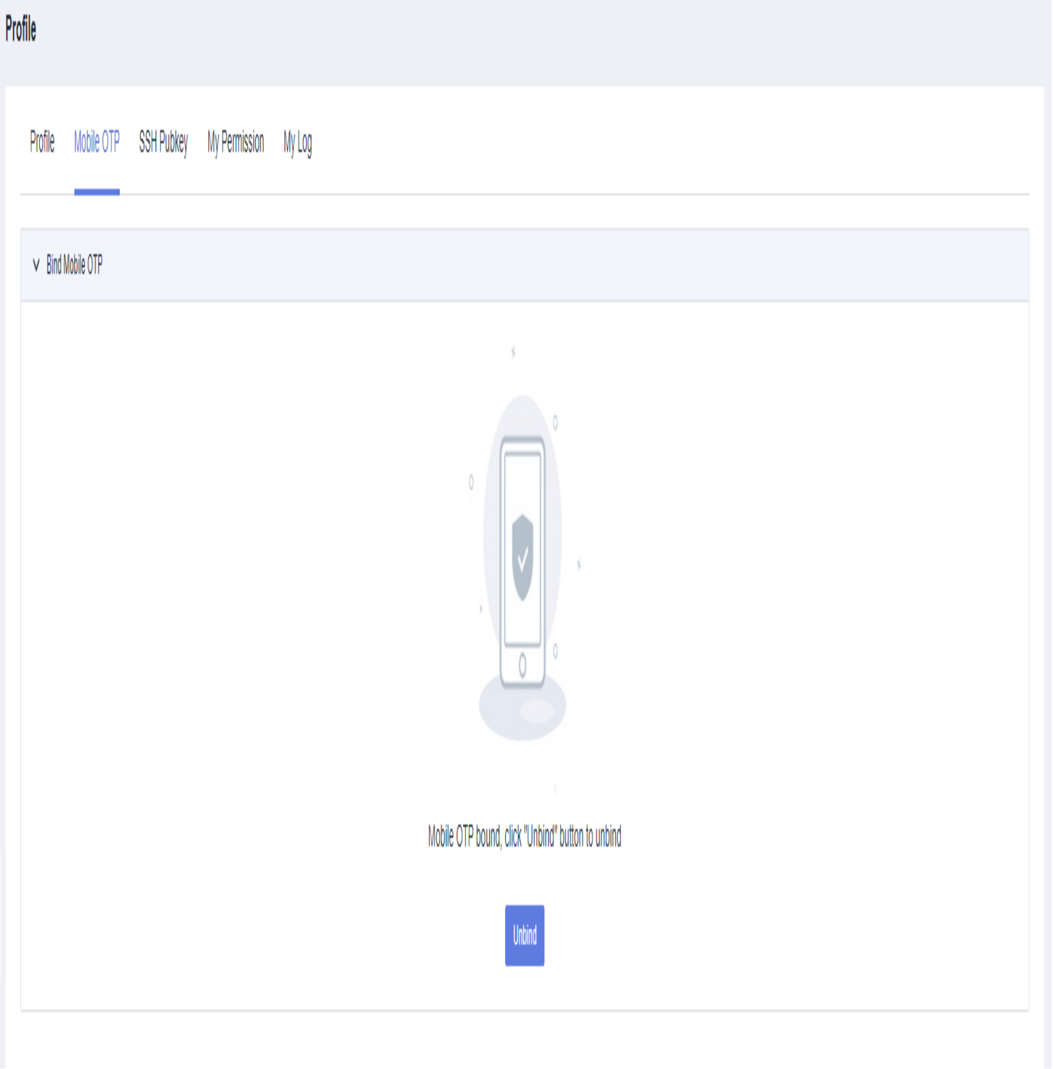
Department: Headquarters

Mobile OTP

To view the mobile phone token bound to your current account, click the **Mobile OTP** tab.

For more details about how to bind or unbind a mobile phone token, see **Managing Mobile OTPs**.

Figure 3-4 Mobile OTP



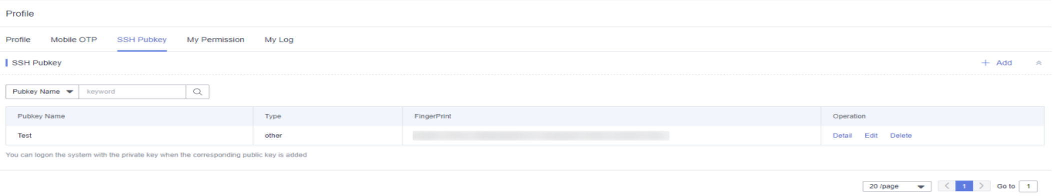
Mobile OTP bound, click "Unbind" button to unbind

SSH Public Key

To view SSH public keys and their basic information, click the **SSH Pubkey** tab.

For details about how to add, modify, and delete a public key, see **Managing SSH Public Keys**.

Figure 3-5 SSH Pubkey



Pubkey Name	Type	FingerPrint	Operation
Test	other	[redacted]	Detail Edit Delete

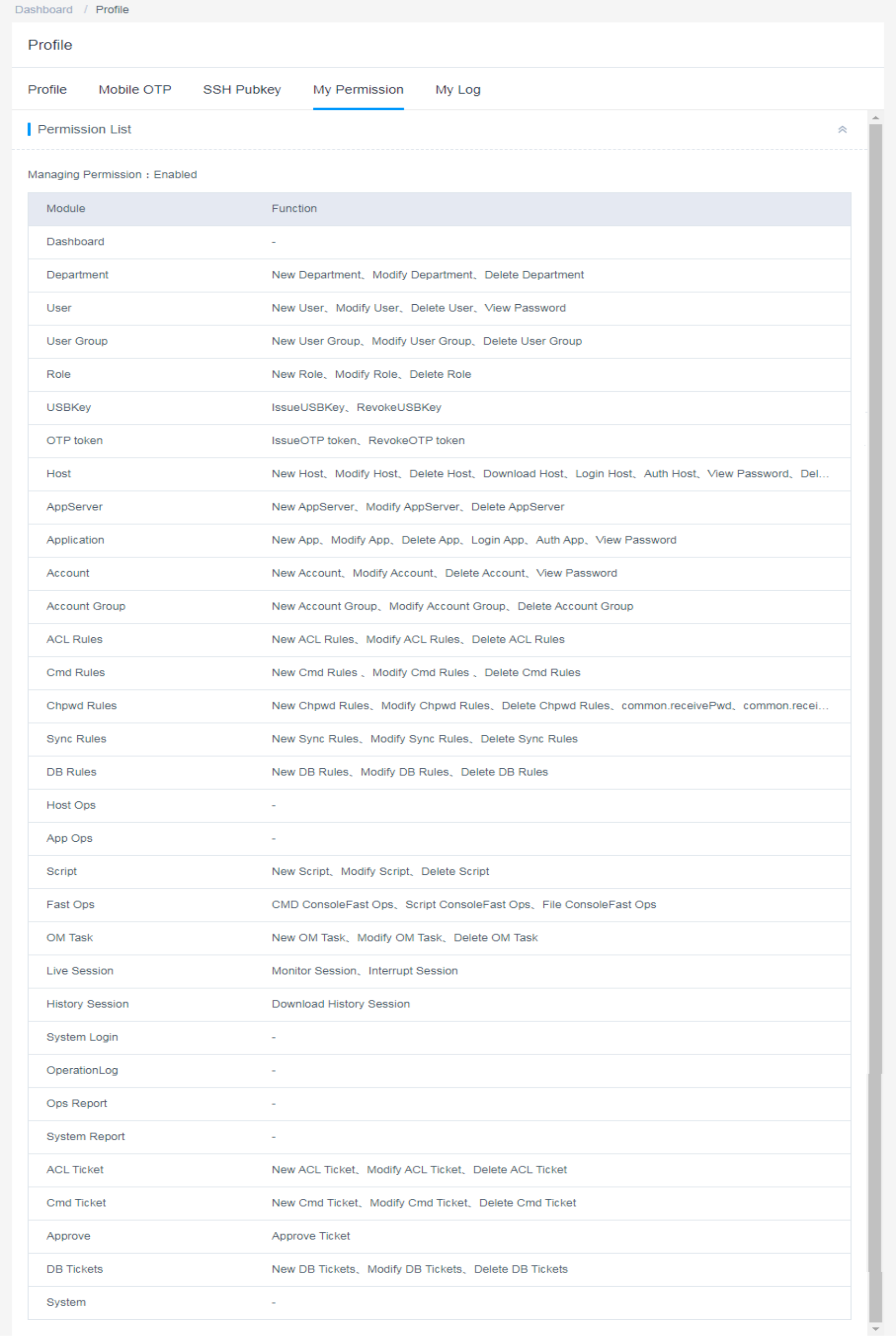
You can logon the system with the private key when the corresponding public key is added

My Permission

To view the personal system permissions and check whether the administrator permission is enabled, click the **My Permission** tab.

Log in to your bastion host as system administrator **admin**.

Figure 3-6 Permissions of user **admin**



Managing Permission : Enabled

Module	Function
Dashboard	-
Department	New Department、Modify Department、Delete Department
User	New User、Modify User、Delete User、View Password
User Group	New User Group、Modify User Group、Delete User Group
Role	New Role、Modify Role、Delete Role
USBKey	IssueUSBKey、RevokeUSBKey
OTP token	IssueOTP token、RevokeOTP token
Host	New Host、Modify Host、Delete Host、Download Host、Login Host、Auth Host、View Password、Del...
AppServer	New AppServer、Modify AppServer、Delete AppServer
Application	New App、Modify App、Delete App、Login App、Auth App、View Password
Account	New Account、Modify Account、Delete Account、View Password
Account Group	New Account Group、Modify Account Group、Delete Account Group
ACL Rules	New ACL Rules、Modify ACL Rules、Delete ACL Rules
Cmd Rules	New Cmd Rules 、Modify Cmd Rules 、Delete Cmd Rules
Chpwd Rules	New Chpwd Rules、Modify Chpwd Rules、Delete Chpwd Rules、common.receivePwd、common.recei...
Sync Rules	New Sync Rules、Modify Sync Rules、Delete Sync Rules
DB Rules	New DB Rules、Modify DB Rules、Delete DB Rules
Host Ops	-
App Ops	-
Script	New Script、Modify Script、Delete Script
Fast Ops	CMD ConsoleFast Ops、Script ConsoleFast Ops、File ConsoleFast Ops
OM Task	New OM Task、Modify OM Task、Delete OM Task
Live Session	Monitor Session、Interrupt Session
History Session	Download History Session
System Login	-
OperationLog	-
Ops Report	-
System Report	-
ACL Ticket	New ACL Ticket、Modify ACL Ticket、Delete ACL Ticket
Cmd Ticket	New Cmd Ticket、Modify Cmd Ticket、Delete Cmd Ticket
Approve	Approve Ticket
DB Tickets	New DB Tickets、Modify DB Tickets、Delete DB Tickets
System	-

My Log

To view logs, click the **My Log** tab. You can then view **System Logon**, **System Operation**, and **Resource Logon** logs.

NOTE

Logs can be managed only by users with the system management permission. Individual users cannot clear their logs. For details, see **Data Maintenance**.

- System logon logs

  A system logon log includes the login time, source IP address of the login user, login method, and login result.

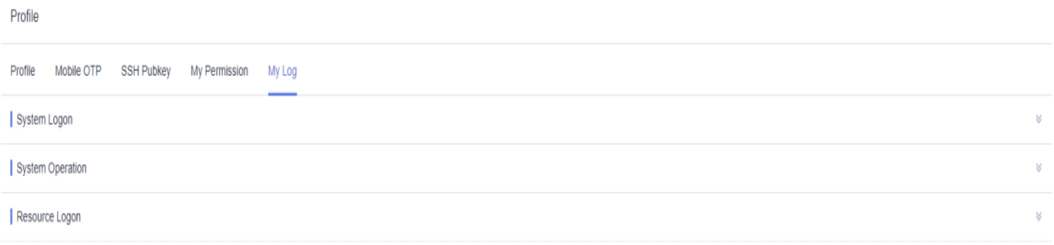
- System operation logs

  A system operation log includes the operation time, source IP address of the operation user, operation module, operation content, and operation result.

- Resource logon logs

  A resource logon log includes the resource name, protocol type, account, source IP address of the login user, login start and end time, and session duration.

Figure 3-7 My Log



3.2.2 Editing Basic Information in Profile

Basic information of a user profile includes the login name, ciphertext password, name, mobile number, email address, role, and department.

- In the Profile area, you can change your password, name, mobile number, and email address.
- The value of **Login Name** must be unique in a bastion host and cannot be changed once it is created.
- Role and department information can be managed only by users with the user management permission and cannot be modified by common individual users. For more details, see **Querying and Modifying User Information**.

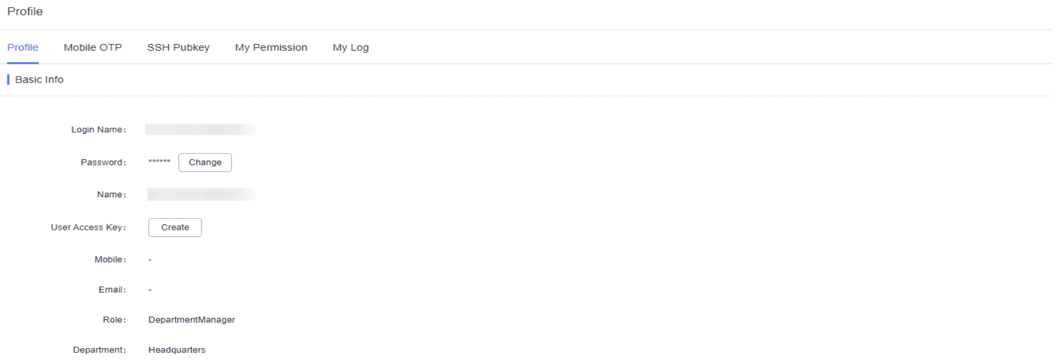
This topic describes how to change your password and modify basic information in the **Profile** area.

Changing Your Password

Step 1 Log in to your bastion host.

Step 2 On the **Dashboard** page, click the user name in the upper right corner and choose **Profile**.

Figure 3-8 Profile



Profile

Profile | Mobile OTP | SSH Pubkey | My Permission | My Log

Basic Info

Login Name: [redacted]

Password: ****** Change

Name: [redacted]

User Access Key: Create

Mobile: -

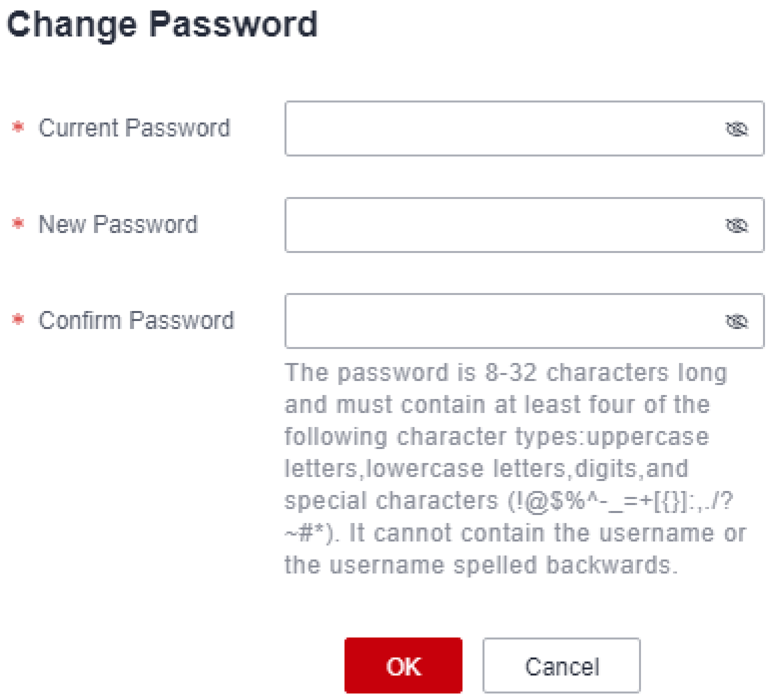
Email: -

Role: DepartmentManager

Department: Headquarters

Step 3 In the **Basic Info** area, click **Change** next to the **Password** field.

Figure 3-9 Change Password



Change Password

* Current Password

* New Password

* Confirm Password

The password is 8-32 characters long and must contain at least four of the following character types:uppercase letters,lowercase letters,digits,and special characters (!@$%^-_=+[{}]:,./?~#*). It cannot contain the username or the username spelled backwards.

OK Cancel

Step 4 In the displayed dialog box, enter the current password and then specify a new password.

The new password must:

- Contain 8 to 32 characters.
- Contain at least three of the following types of characters: uppercase letters (A to Z), lowercase letters (a to z), digits (0 to 9), and following special characters: !@$%^-_=+[{}]:,./?~#*
- Cannot contain the username or the username spelled backwards.

Step 5 Click **OK**.

Log out of the system. The new password takes effect after you log in to the system again.

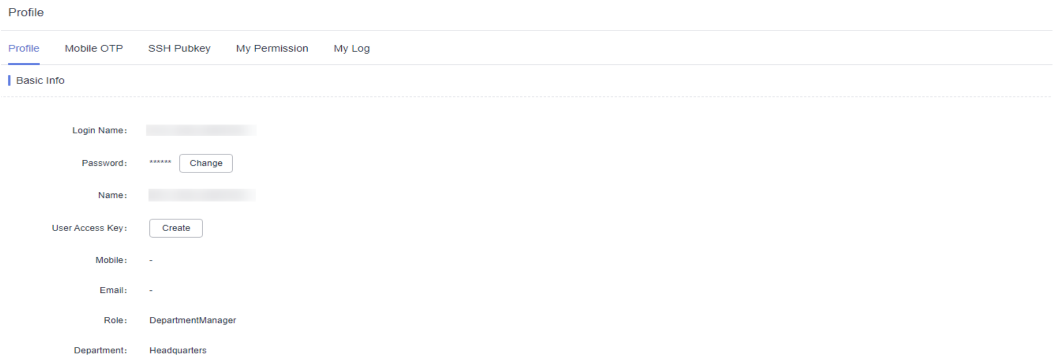
----End

Modifying Basic Information

Step 1 Log in to your bastion host.

Step 2 On the **Dashboard** page, click the user name in the upper right corner and choose **Profile**.

Figure 3-10 Profile



Profile

Basic Info

Login Name: [redacted]

Password: ****** Change

Name: [redacted]

User Access Key: Create

Mobile: -

Email: -

Role: DepartmentManager

Department: Headquarters

Step 3 Click **Edit** in the **Basic Info** area.

Step 4 In the displayed dialog box, enter the user name, mobile number, or email address into the **Name**, **Mobile**, and **Email** text boxes, respectively.

Step 5 Click **OK**.

The new user name, mobile number, and email address take effect upon the completion of editing.

----End

3.2.3 Managing Mobile OTP Application for Login Authentication

A mobile OTP application is a software token application used to generate a dynamic password on a bound mobile phone. You can configure mobile one-time password (OTP) verification to implement MFA for your bastion host. After mobile OTP verification is configured, in addition to the username and password, a 6-digit mobile OTP verification code is required for each login. For details, see **Configuring Mobile OTP Login Authentication**.

Currently, built-in mobile OTPs and Remote Authentication Dial In User Service (RADIUS) mobile OTPs are supported.

- Built-in mobile OTP application: WeChat applet mobile OTP.
- RADIUS mobile OTP applications: Google Authenticator and FreeOTP

NOTICE

- Ensure that your bastion host and mobile phone have the same system time, accurate to seconds. Otherwise, the mobile OTP application may fail to be bound to the user account.
- If the mobile OTP fails to be bound, change the system time to be the same as the mobile phone time. After this, refresh the page to generate a new quick response (QR) code for binding.

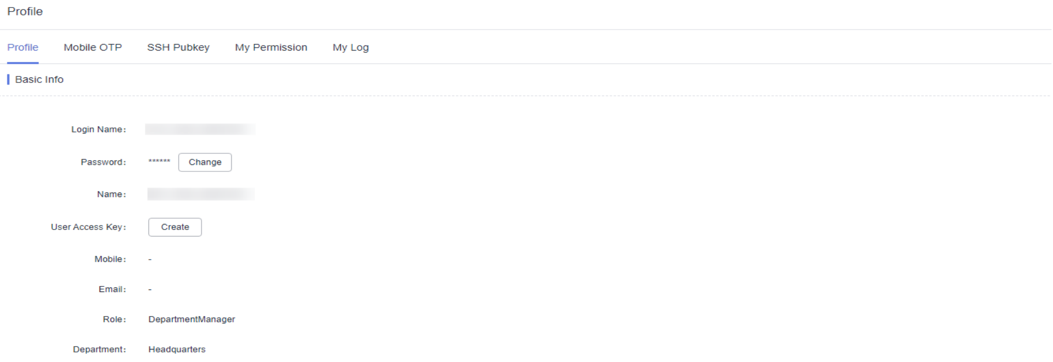
This topic describes how to bind and unbind a mobile OTP application.

Binding a Mobile OTP application to a User

Step 1 Log in to your bastion host.

Step 2 On the **Dashboard** page, click the user name in the upper right corner and choose **Profile**.

Figure 3-11 Profile



Login Name: [redacted]

Password: ****** Change

Name: [redacted]

User Access Key: Create

Mobile: -

Email: -

Role: DepartmentManager

Department: Headquarters

Step 3 Click the **Mobile OTP** tab.

Step 4 In the displayed **Mobile OTP** dialog box, bind a mobile OTP application as prompted.

1. WeChat applet access token

   Start WeChat on the mobile phone, obtain the dynamic password for binding according to the operation guide, and enter the 6-digit dynamic password. After the verification, the mobile OTP application is bound.

2. App-based mobile OTP

   Start the installed mobile OTP application, scan the QR code in step 2 to obtain a dynamic password, and enter the 6-digit dynamic password. After the verification, the mobile OTP application is bound to you.

Step 5 Refresh the page.

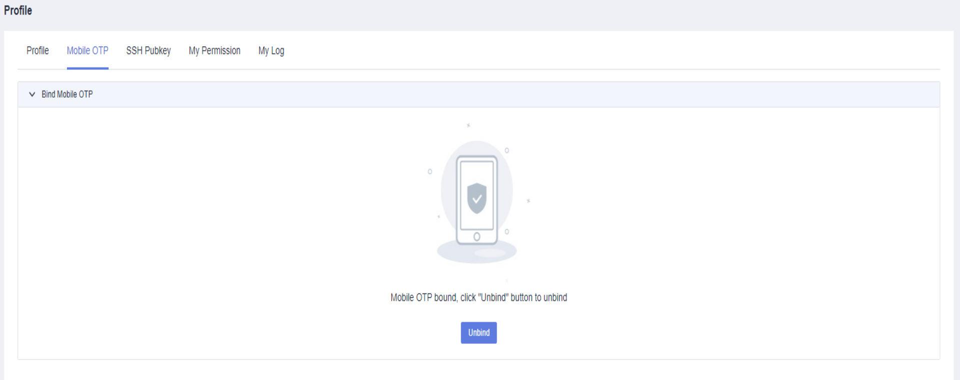
----End

Unbinding a Mobile OTP Application

Click **Unbind** on the **Mobile OTP** tab to unbind the mobile OTP application.

After the unbinding, refresh the page.

Figure 3-12 Unbinding a mobile OTP application



Mobile OTP bound, click "Unbind" button to unbind

3.2.4 Managing SSH Public Keys

Your SSH public key is used for passwordless login over the SSH client.

This topic describes how to add, modify, and delete an SSH public key.

Constraints

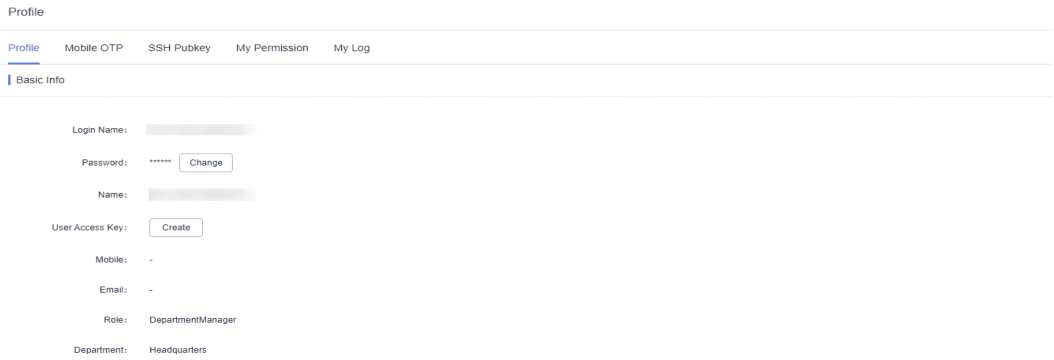
Only OpenSSH public keys are supported.

Adding an SSH Public Key

Step 1 Log in to your bastion host.

Step 2 On the **Dashboard** page, click the user name in the upper right corner and choose **Profile**.

Figure 3-13 Profile



Login Name: [redacted]

Password: ******

Name: [redacted]

User Access Key:

Mobile: -

Email: -

Role: DepartmentManager

Department: Headquarters

Step 3 Click the **SSH Pubkey** tab.

Step 4 Click **Add** in the **SSH Pubkey** area.

Step 5 In the displayed **Add SSH Pubkey** dialog, specify the public key name and enter the SSH public key.

Step 6 Click **OK**. You can view the added SSH public key.

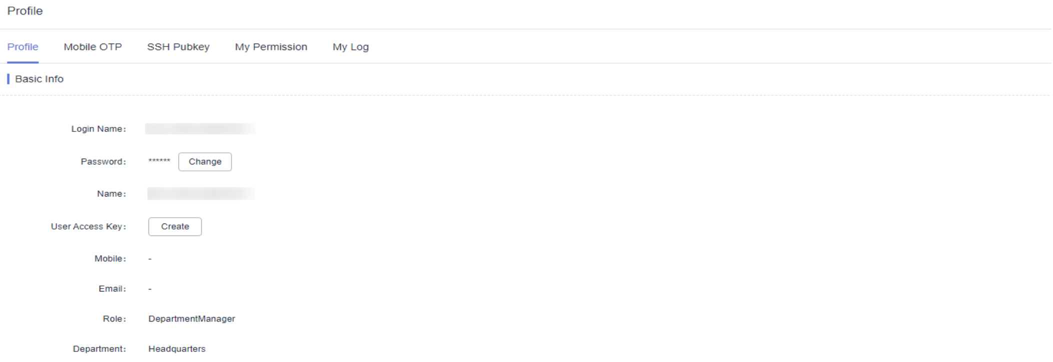
----End

Deleting an SSH Public Key

Step 1 Log in to your bastion host.

Step 2 On the **Dashboard** page, click the user name in the upper right corner and choose **Profile**.

Figure 3-14 Profile



Profile

Profile | Mobile OTP | SSH Pubkey | My Permission | My Log

Basic Info

Login Name: [redacted]

Password: ****** Change

Name: [redacted]

User Access Key: Create

Mobile: -

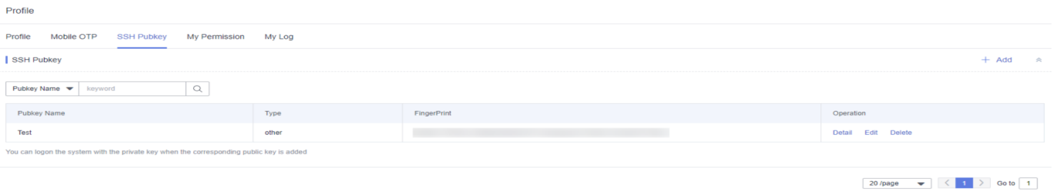
Email: -

Role: DepartmentManager

Department: Headquarters

Step 3 Click the **SSH Pubkey** tab.

Figure 3-15 SSH Pubkey



Profile

Profile | Mobile OTP | SSH Pubkey | My Permission | My Log

SSH Pubkey

+ Add

Pubkey Name ▾ keyword

Pubkey Name	Type	FingerPrint	Operation
Test	other	[redacted]	Detail Edit Delete

You can logon the system with the private key when the corresponding public key is added

20 /page ▾ < 1 > Go to 1

Step 4 In the **Operation** column of the SSH public key you want to delete, click **Delete**.

Step 5 In the displayed confirmation dialog box, click **OK**.

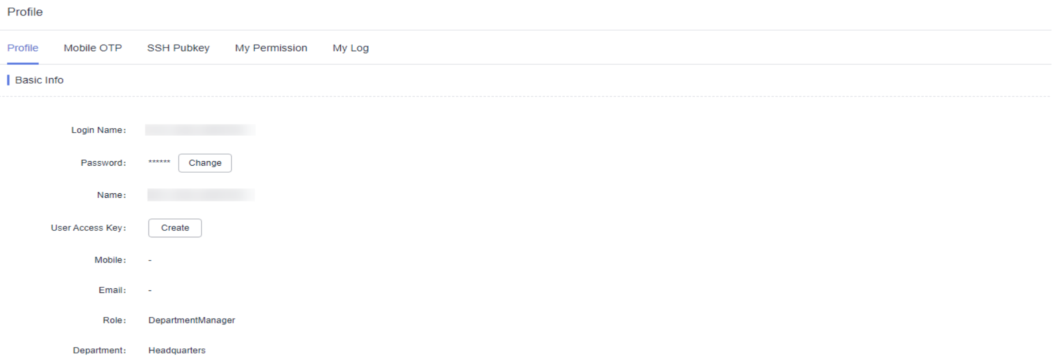
----End

Editing an SSH Public Key

Step 1 Log in to your bastion host.

Step 2 On the **Dashboard** page, click the user name in the upper right corner and choose **Profile**.

Figure 3-16 Profile



Profile

Basic Info

Login Name:

Password: ****** Change

Name:

User Access Key: Create

Mobile: -

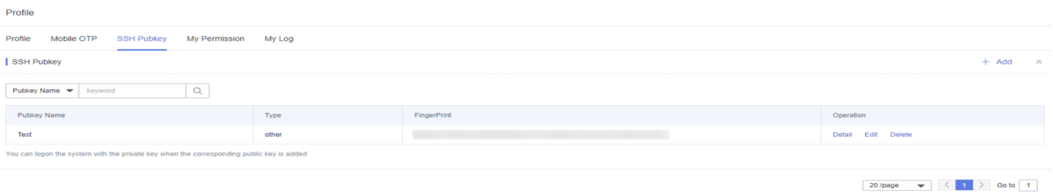
Email: -

Role: DepartmentManager

Department: Headquarters

Step 3 Click the **SSH Pubkey** tab.

Figure 3-17 SSH Pubkey



Profile

Pubkey Name	Type	FingerPrint	Operation
Test	other		Detail Edit Delete

You can logon the system with the private key when the corresponding public key is added

Step 4 In the **Operation** column of the SSH public key you want to modify, click **Edit**.

Step 5 In the displayed **Edit SSH pubkey** dialog box, edit the public key name and the public key.

Step 6 Click **OK**. You can view the modified SSH public key.

----End

3.3 Tasks

The task center is the task management center that displays the task receiving status.

- Task types: importing a user, host, cloud server, application, application server, and an account, changing the password of an account, synchronizing users from the AD Domain server, PBH system maintenance (including upgrade and restoration), generating an O&M video, account synchronization, account verification, configuring backup mechanism, automatic O&M, importing dynamical OTPs, and installing Agent.
- The task status can be **Executing**, **Finished**, or **Stop**.

This topic describes how to view a task in the task center.

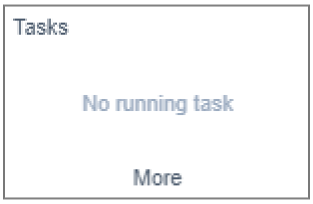
Procedure

Step 1 Log in to your bastion host.

Step 2 Click ☰ in the upper right corner of the page to show the small task center window.

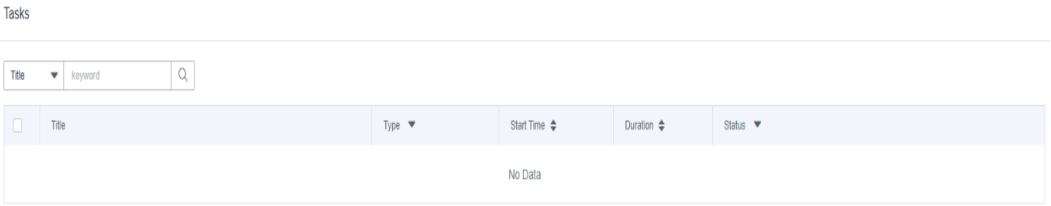
You can view the latest three tasks that are being executed.

Figure 3-18 Small task center window



Step 3 Click **More** to go to the **Tasks** page.

Figure 3-19 Viewing a task list



	Title	Type	Start Time	Duration	Status

No Data

Step 4 Query tasks.

Enter a keyword in the search box and search for tasks by title.

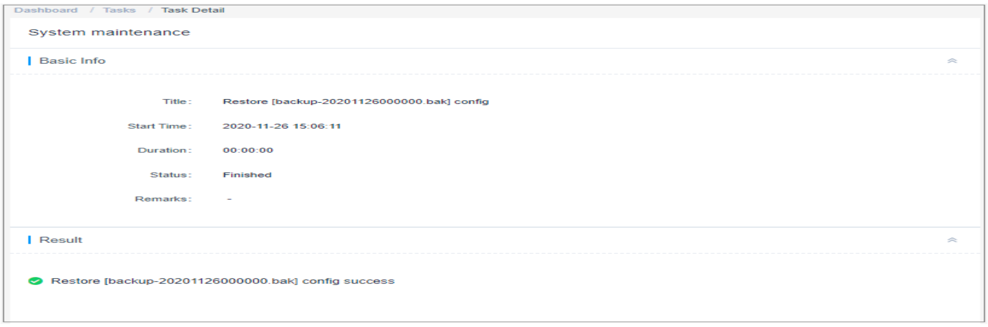
Step 5 View the tasks.

On the **Tasks** page, you can view all running tasks, finished tasks, and stopped tasks.

Step 6 View task details.

1. Click the name of a task.
2. View the basic information and execution result of the task.

Figure 3-20 View task details.



System maintenance

Basic Info

Title: Restore [backup-20201126000000.bak] config
Start Time: 2020-11-26 15:06:11
Duration: 00:00:00
Status: Finished
Remarks: -

Result

✓ Restore [backup-20201126000000.bak] config success

----End

3.4 Messages

3.4.1 Managing Messages

The message center receives system messages. The latest three unread messages are displayed in the small message center window. After a task is complete, you can view messages about all tasks in the task center.

- There are five types of messages, including system messages, service messages, task messages, command alarms, and ticket messages.
- All messages are classified in to three levels by importance, **High**, **Medium**, or **Low**.

This topic describes how to view, delete, and mark messages in message center in a bastion host.

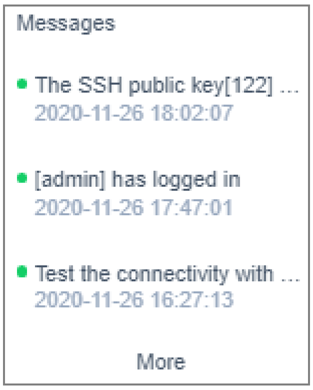
Viewing Messages

Step 1 Log in to your bastion host.

Step 2 Click 🔔 in the upper right corner to view the latest three unread messages.

The following figure shows an example.

Figure 3-21 Small message center window



Messages

● The SSH public key[122] ...
2020-11-26 18:02:07

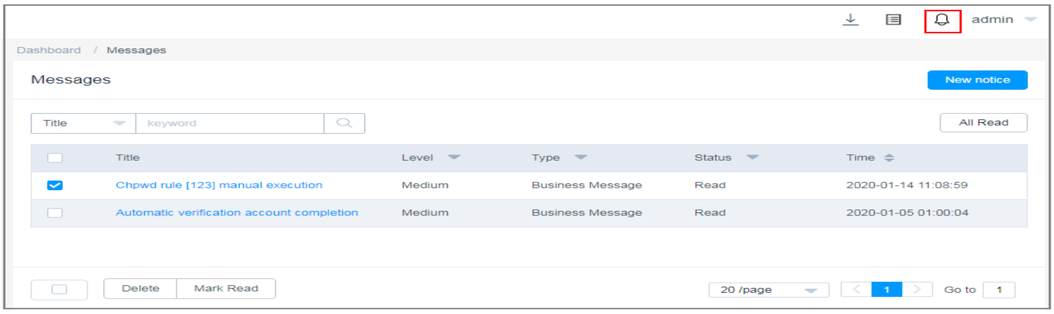
● [admin] has logged in
2020-11-26 17:47:01

● Test the connectivity with ...
2020-11-26 16:27:13

More

Step 3 Click **More** to go to the **Messages** page.

Figure 3-22 Message list



□	Title	Level	Type	Status	Time
☑	Chpwd rule [123] manual execution	Medium	Business Message	Read	2020-01-14 11:08:59
□	Automatic verification account completion	Medium	Business Message	Read	2020-01-05 01:00:04

Step 4 Query messages.

Enter a keyword in the search box and search for messages by message title.

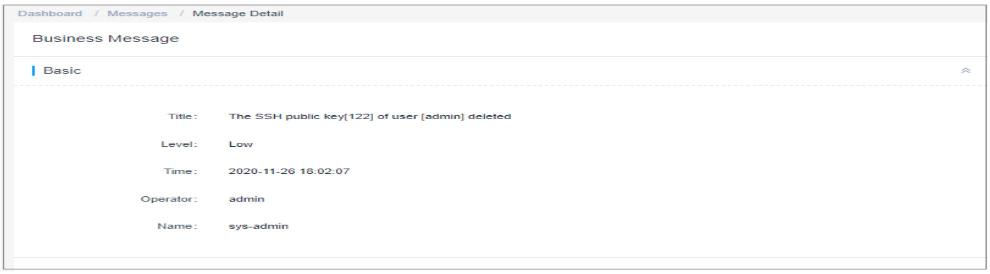
Step 5 View the search results.

Messages are sorted in descending order by time. You can view all read and unread messages.

Step 6 Viewing message details.

1. Click the name of the message to go to the details page.
2. View basic information of the message.

Figure 3-23 Message details



Title: The SSH public key[122] of user [admin] deleted

Level: Low

Time: 2020-11-26 18:02:07

Operator: admin

Name: sys-admin

----End

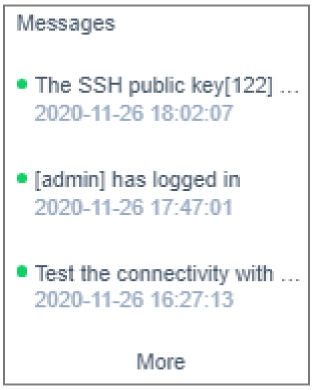
Deleting a Message

Step 1 Log in to your bastion host.

Step 2 Click 🔔 in the upper right corner to view the latest three unread messages.

The following figure shows an example.

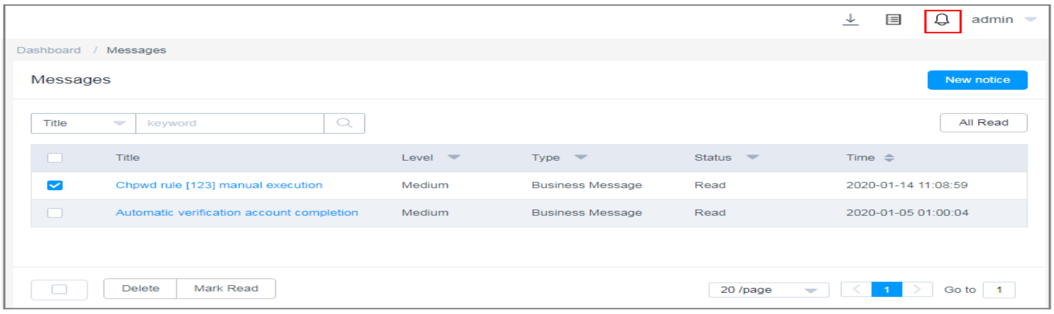
Figure 3-24 Small message center window



- The SSH public key[122] ...
  2020-11-26 18:02:07
- [admin] has logged in
  2020-11-26 17:47:01
- Test the connectivity with ...
  2020-11-26 16:27:13

Step 3 Click **More** to go to the **Messages** page.

Figure 3-25 Message list



	Title	Level	Type	Status	Time
☑	Chpwd rule [123] manual execution	Medium	Business Message	Read	2020-01-14 11:08:59
□	Automatic verification account completion	Medium	Business Message	Read	2020-01-05 01:00:04

Step 4 Select one or more messages and click **Delete** in the lower left corner.

Step 5 In the confirmation dialog box, click **OK** to delete the selected messages immediately.

⚠ CAUTION

Deleted messages cannot be restored. Exercise caution when performing this operation.

----End

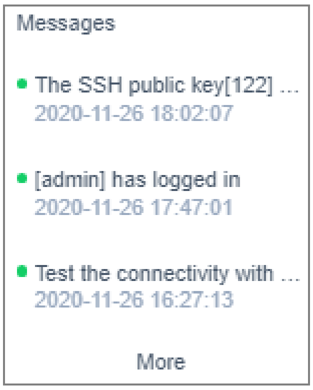
Marking a Message

Step 1 Log in to your bastion host.

Step 2 Click 🔔 in the upper right corner to view the latest three unread messages.

The following figure shows an example.

Figure 3-26 Small message center window



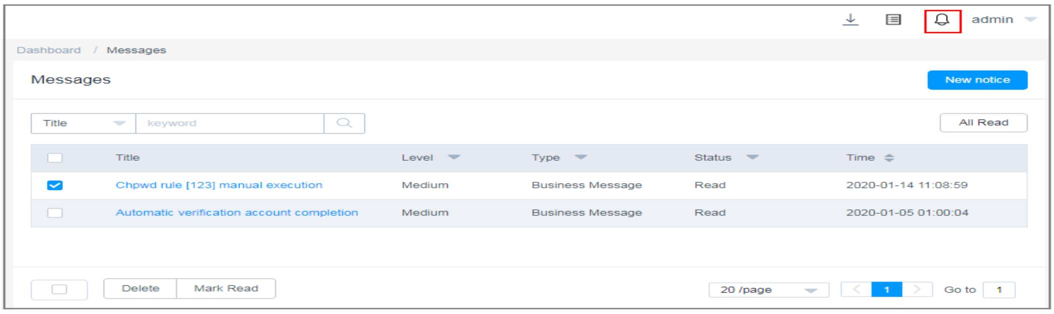
Messages

- The SSH public key[122] ...
  2020-11-26 18:02:07
- [admin] has logged in
  2020-11-26 17:47:01
- Test the connectivity with ...
  2020-11-26 16:27:13

More

Step 3 Click **More** to go to the **Messages** page.

Figure 3-27 Message list



	Title	Level	Type	Status	Time
☐					
☑	Chpwd rule [123] manual execution	Medium	Business Message	Read	2020-01-14 11:08:59
☐	Automatic verification account completion	Medium	Business Message	Read	2020-01-05 01:00:04

Step 4 Marks one or more messages.

1. Select one or more messages and click **Mark Read** in the lower left corner.
2. In the displayed confirmation dialog box, click **OK**. The status of the target message changes to **Read**.

Step 5 Mark all messages.

1. Click **All Read**.
2. In the displayed confirmation dialog box, click **OK**. The status of the all messages changes to **Read**.

----End

3.4.2 Creating a System Notice

A system notice is used to notify system users of major changes in the system. After a system notice is created, the notice content is displayed on the top of page for each system user.

As an individual system user, to let the system notice not show again, click **Read** on the left of the notice.

This topic describes how to create system notices in the message center.

Constraints

- Only system administrator **admin** can create system notices.
- A system notice is intended for all users in the system. It cannot be customized.
- Only one system notice can be shown each time.

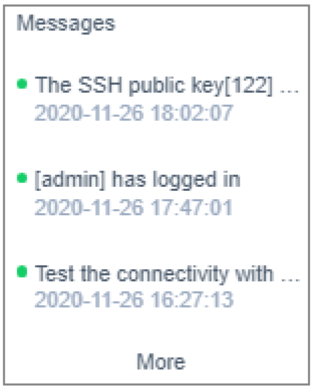
Procedure

Step 1 Log in to your bastion host.

Step 2 Click 🔔 in the upper right corner to view the latest three unread messages.

The following figure shows an example.

Figure 3-28 Small message center window



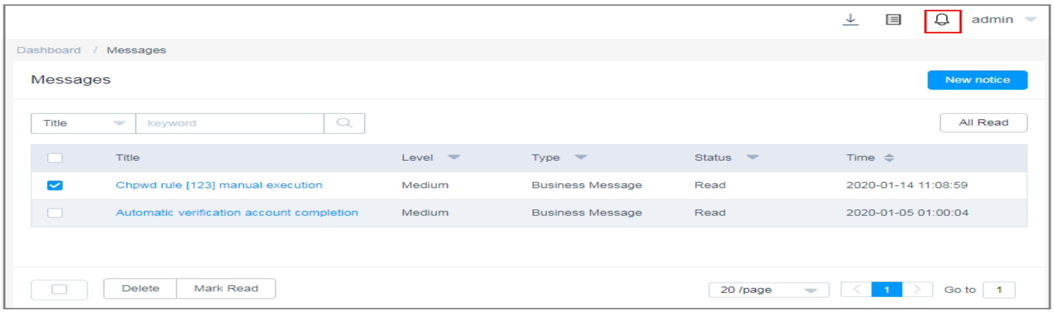
Messages

- The SSH public key[122] ...
  2020-11-26 18:02:07
- [admin] has logged in
  2020-11-26 17:47:01
- Test the connectivity with ...
  2020-11-26 16:27:13

More

Step 3 Click **More** to go to the **Messages** page.

Figure 3-29 Message list



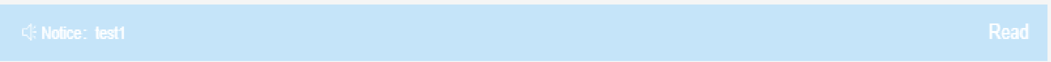
☐	Title	Level	Type	Status	Time
☑	Chpwd rule [123] manual execution	Medium	Business Message	Read	2020-01-14 11:08:59
☐	Automatic verification account completion	Medium	Business Message	Read	2020-01-05 01:00:04

Step 4 Click **New notice**.

Step 5 In the displayed **New notice** dialog box, enter the content.

Step 6 Click **OK**. You can view the unread system notice.

Figure 3-30 Example notice



Notice: test1

----End

3.5 Download Center

A wide range of client tools, including database clients, are compatible. Their download links are in the **Download Center**.

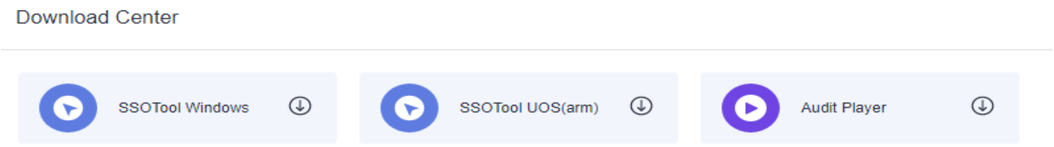
The topic describes how to enter the download center.

Procedure

Step 1 Log in to your bastion host.

Step 2 Click ⤓ in the upper right corner. The download center client tool list page is displayed.

Figure 3-31 Download Center



Step 3 Click ⓘ next to a client tool to go to the third-party tool page and download the tool as required.

----End

4 Department

4.1 Overview

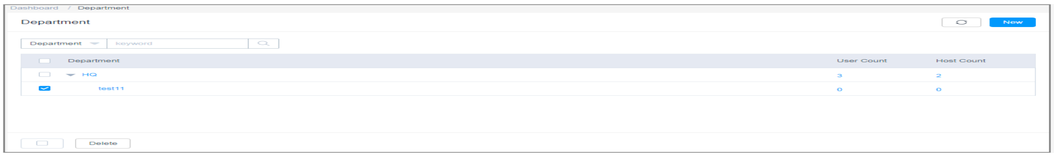
The **Department** module works as an organization that is used to group organization structure and identify users and resources. A CBH system has a default department named **HQ**. The **HQ** department cannot be deleted. Other departments can be created only under the **HQ** department.

Users in lower-level departments cannot view superior department information, including the organization structure, users, host resources, application resources, application publish servers, resource accounts, and policies and operation audit data configured by superior departments.

For users in different departments, they can be managed by administrators of their own department and superior department only.

Only system administrator **admin** or users with the management permissions for the **Department** module can manage the department organization structure, including creating, editing, deleting, and querying a department, querying users in a certain department, and querying resources in a certain department.

Figure 4-1 Department management



Dashboard / Department

Department

Department ▾ | keyword

□	Department	User Count	Host Count
□	▾ HQ	3	2
☑	test11	0	0

4.2 Creating a Department

The default department **HQ** is the top department in a bastion host. You can create departments only under **HQ**.

Prerequisites

You have the operation permissions for the **Department** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 In the navigation pane on the left, select **Department**.

Step 3 On the displayed page, click **New** in the upper right corner of the page to open the **New Department** dialog box.

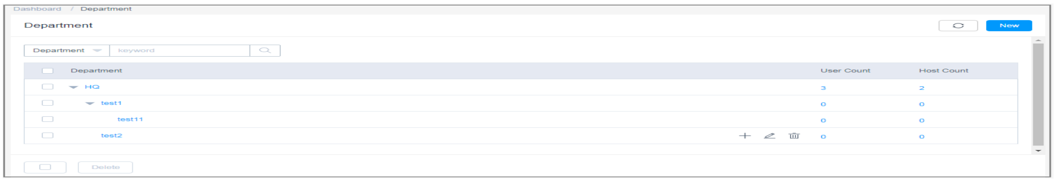
Step 4 Select a superior department for **Superior Dept**, enter a name of the department to be created in the **Department** field, and enter the description in the **Remarks** area if necessary.

NOTE

- The department name defined in a bastion host must be unique.
- The superior department can be selected only from the existing department directory tree.

Step 5 Click **OK**. You can then view the new department on the department management page.

Figure 4-2 Creating a department



□	Department		User Count	Host Count
□	HQ		3	2
□	test1		0	0
□	test11		0	0
□	test2	+	0	0

----End

How to Create a Department Quickly

Step 1 Log in to your bastion host.

Step 2 Select **Department** in the navigation pane on the left.

Step 3 In the column of the corresponding superior department, click + to create a lower-level department.

Step 4 Change the department name.

----End

4.3 Deleting a Department

The default department **HQ** is the top department in a bastion host and cannot be deleted. When a superior department is deleted, all its lower-level departments are deleted automatically.

Prerequisites

You have the operation permissions for the **Department** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Select **Department** in the navigation pane on the left.

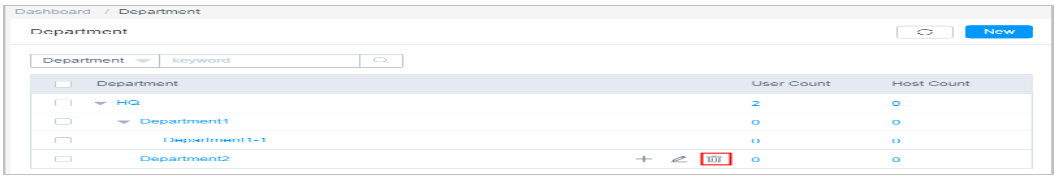
Step 3 Delete a department.

Move the cursor over the row where the department to be deleted locates to let the operation icons appear. Click then the deletion icon to delete the department.

NOTE

Deleting a department will delete all its lower-level departments, users, and resources under the department and all its lower-level departments.

Figure 4-3 Deleting a department

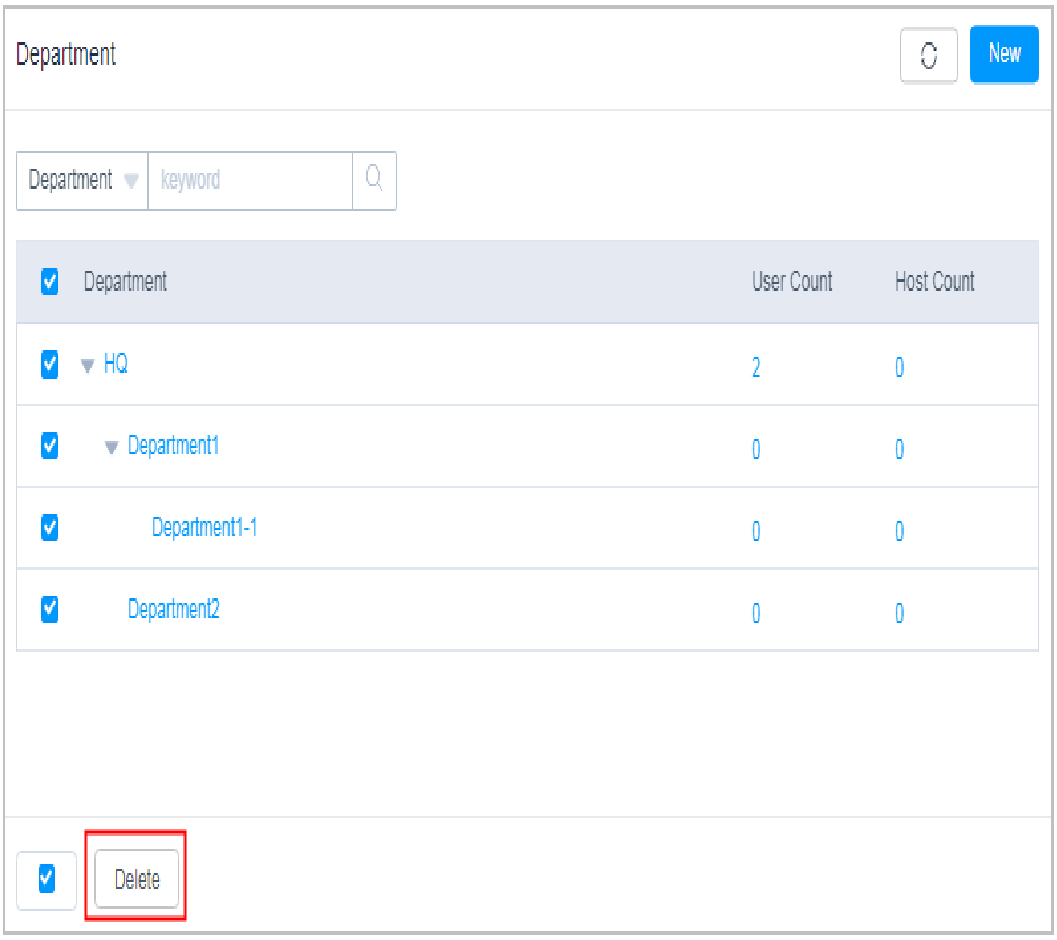


□	Department	User Count	Host Count
□	HQ	2	0
□	Department1	0	0
□	Department1-1	0	0
□	Department2	0	0

Step 4 Delete departments in batches.

Select the ones you want and click **Delete** at the bottom of the list to delete all selected departments together.

Figure 4-4 Batch deleting departments



☑ Department	User Count	Host Count
☑ ▾ HQ	2	0
☑ ▾ Department1	0	0
☑ Department1-1	0	0
☑ Department2	0	0

----End

4.4 Viewing and Editing Department Information

You can change department name and superior department a department belongs to.

After a department is moved from one superior department to another, resources and users in the department are automatically moved accordingly.

Prerequisites

You have the operation permissions for the **Department** module.

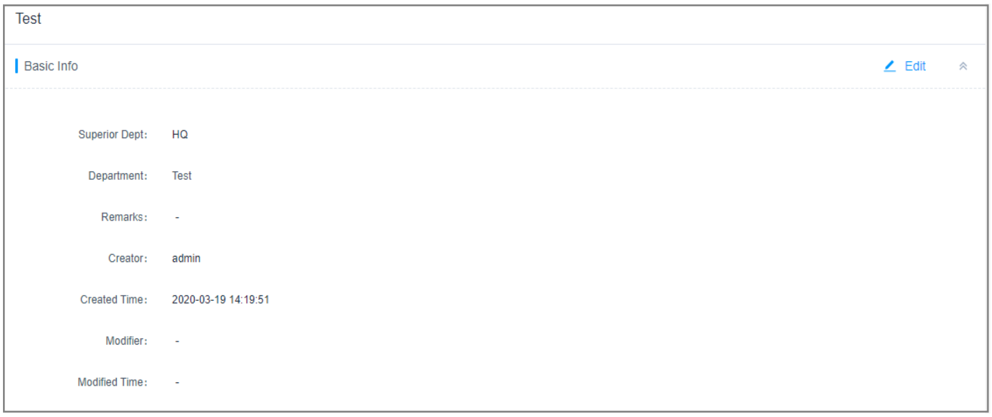
Procedure

Step 1 Log in to your bastion host.

Step 2 Select **Department** in the navigation pane on the left.

Step 3 Click the name of the department to be edited.

Figure 4-5 Basic department information



Superior Dept: HQ

Department: Test

Remarks: -

Creator: admin

Created Time: 2020-03-19 14:19:51

Modifier: -

Modified Time: -

Step 4 In the **Basic Info** area, view the detailed information about the department.

Click **Edit** and edit basic information.

----End

4.5 Querying Configurations of a Department

A bastion host can collect statistics on the number of users and hosts under each department. You can query the user and host asset configurations of a department on the department management page. Application resources and application publish servers are not included in the statistics.

Prerequisites

You have the operation permissions for the **Department** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Select **Department** in the navigation pane on the left.

Step 3 Enter a department name in the search box to query the superior department tree to which the department belongs.

Step 4 View the number of users or hosts in the **User Count** or **Host Count** column in each department in the department tree.

Step 5 Click a specific number to go to the **User** or **Host** page, respectively, and then view the department configuration.

----End

5 User

5.1 Overview

You can centrally manage all system users. Creating a bastion host system user is to create an account for logging in to a bastion host. The system administrator **admin** is the first account for users to log in to a bastion host for the first time. The **admin** user has the highest operation permissions and such permissions cannot be deleted or changed.

- System operation permissions of different users vary depending on their roles.
- Resource operation permissions can be assigned to users by user group.

Only **admin** or users with permissions for the **User** module can manage system users, including creating users, batch importing and exporting users, resetting user accounts and passwords, moving users to another department, changing user roles, adding users to user groups, configuring user login permissions, enabling and disabling users, and batch managing users.

5.2 User Management

5.2.1 Creating a User and Assigning a Role to the User

You can create users, import external users, and synchronize users from an Active Directory (AD) server. So that those users can log in to and use your bastion host for O&M.

The **admin** user has the highest permissions for the corresponding bastion host. It is also the first user who can log in to the bastion host. This means all other system users are created by user **admin**.

Constraints

To set **Department** to a superior department for a user, you must have management permissions for the **Department** module. For details about how to edit the role permissions of a user, see **Editing Role Information**.

Prerequisites

- You have obtained the permissions to create or import users on the **User** module.
- You have obtained the permissions to synchronize users from the AD domain server to the **System** module.

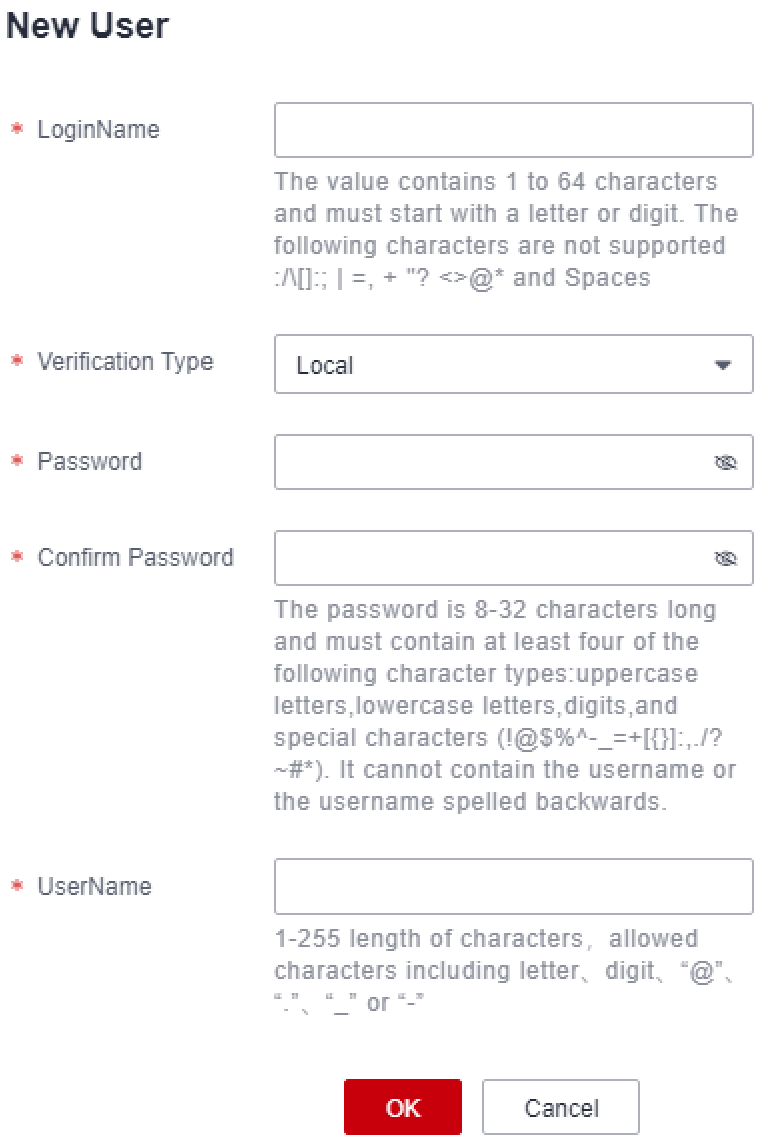
Creating a User

Step 1 Log in to your bastion host.

Step 2 In the navigation pane on the left, choose **User** > **User** to go to the user list page.

Step 3 In the upper right corner of the page, click **New**. In the displayed **New User** dialog box, complete required parameters.

Figure 5-1 New User



New User

* LoginName

The value contains 1 to 64 characters and must start with a letter or digit. The following characters are not supported :/\[]:; | =, + "? <>@* and Spaces

* Verification Type: Local

* Password

* Confirm Password

The password is 8-32 characters long and must contain at least four of the following character types:uppercase letters,lowercase letters,digits,and special characters (!@$%^-_=+[{}]:,./?~#*). It cannot contain the username or the username spelled backwards.

* UserName

1-255 length of characters， allowed characters including letter、digit、"@"、"."、"_" or "-"

Table 5-1 Parameters for creating a user

Parameter	Description
LoginName	Specifies the username for logging in to the system. The **LoginName** must be unique in a system and cannot be changed once created.
Verification Type	Specifies how the user is verified for logging in to the bastion host. ● **Local**: The user is verified against the account management system of the bastion host. This method is the default method. ● **AD**: The user is verified against the Windows AD domain server. ● **LDAP**: The user is verified against the third-party authentication server through the LDAP protocol. ● **RADIUS**: The user is verified against the third-party authentication server through the RADIUS protocol. ● **Azure AD**: The user is verified against the Azure platform based on Security Assertion Markup Language (SAML) configuration. **NOTE** If you want to verify the user against a remote AD domain, LDAP, or RADIUS servers or verify the user against the Azure AD service, configure the remote authentication server in the bastion host. For details, see **Authentication Configuration**.
Password/ Confirm Password	A password must be configured for the user to log in to the bastion host if you select **Local** for **Verification Type**.
UserName	Specifies the user-defined user name. This name indicates the name of the person who uses the account so that system users can be distinguished from each other.
Mobile	Specifies the mobile number of the user. This number is used for SMS authentication logins and password resetting.
Email	Specifies the email address of the user. The bastion host sends notifications to this email address.

Parameter	Description
Role	Specifies the role to be assigned to the user. Only one role can be assigned. By default, system roles include **DepartmentManager**, **PolicyManager**, **AuditManager**, and **User**. ● **DepartmentManager**: responsible for managing departments. Except the **User** and **Role** modules, this role has the configuration permissions for all other modules. ● **PolicyManager**: responsible for configuring policy permissions. This role has the configuration permissions for the **User Group**, **Account Group**, and **ACL Rules** modules. ● **AuditManager**: responsible for auditing system and maintenance data. This role has the configuration permission for **Live Session**, **History Session**, and **System Log** modules. ● **User**: common system users and resource operators. This role has the permissions for the **Host Operations**, **App Operations**, and **Ticket approval** modules. ● User-defined role: Only the **admin** user can customize a new role or edit permissions of a default role. For details, see **Role Overview**.
Department Name	Specifies the department to which the user belongs. For details about how to create a department, see **Creating a Department**.
Remarks	(Optional) Provides supplementary information about the user.

Step 4 Click **OK**.

----End

Batch Importing Users

Step 1 Log in to your bastion host.

Step 2 In the navigation pane on the left, choose **User** > **User** to go to the user list page.

Step 3 Click in the upper right corner.

Step 4 Click **Download** next to **Download template**.

Step 5 Enter the information of users according to the configuration requirements in the template.

Table 5-2 Template parameters

Parameter	Description
LoginName	(Mandatory) Specifies the username for the user to log in to the bastion host.

Parameter	Description
Verification Type	(Mandatory) Specifies the authentication method. Only one authentication method can be entered. You can select **Local**, **RADIUS**, **AD Domain**, **LDAP**, **Azure AD**, or **IAM**.
Password	(Mandatory) Specifies the user-defined login password. This parameter is required when **Verification Type** is set to **Local**.
Authentication server/ Domain name	(Mandatory) Specifies the authentication server. This parameter is required if **Verification Type** is set to **AD**, **LDAP**, or **Azure AD**. Note that the value must be entered in required format. ● For AD domain authentication, the value must be in the format of *IP:PORT*, for example, *10.10.10.10:389*. ● For LDAP authentication, the value must be in the format of *IP:'PORT/ou=test,dc=test,dc=com'*, for example, *10.10.10.10:'389/ou=test,dc=com'*. ● For Azure AD authentication, provide the domain name.
UserName	Enter the name of a system user.
Mobile	Enter the mobile number of a system user.
Email	(Mandatory) Enter the email address of a system user.
Role	(Mandatory) Enter the system role of the user. ● Only one role type can be entered. ● There are four default roles for your choice: **DepartmentManager**, **PolicyManager**, **AuditManager**, and **User**. ● Only the **role** that has been created in the system can be entered.
Department Name	(Mandatory) Enter the department to which the user belongs. The department structure must be complete. ● Only one department structure can be entered, and a user can belong to only one department. ● By default, the department can be set to **HQ**. Use a comma (,) to separate a department and its lower-level department. ● Only the **department** that has been created in the system can be entered.
Remarks	Provides supplementary information about the user account.
User Groups	Specifies the user group that a user belongs to. ● A user account can belong to multiple user groups in the same department. Use a comma (,) to separate every two user groups. ● Only the **user group** that has been created in the system can be entered.

Step 6 Click **Upload** and select the completed template file.

Step 7 (Optional) Select **Override existing user**.

- Selected: If an existing user account and the user account being imported have the same **LoginName**, the existing one will be overwritten. The user account information in the bastion host is updated accordingly.
- Deselected: If an existing user account and the user account being imported have the same **LoginName**, the existing one will be skipped and kept unchanged.

Step 8 Click **OK**. You can then view the new system user on the user list page.

----End

Synchronizing AD Domain Users

You can configure **Sync Mode** for the AD authentication to let the system synchronize existing user information on the AD domain server to your bastion host. When a user logs in to the bastion host, the AD domain server provides the identity authentication service.

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Authenticate**.

Step 3 Click **Add** in the **AD Settings** area.

Step 4 Set the AD domain authentication **Mode** to **Sync Mode**.

Table 5-3 AD settings for synchronizing users

Parameter	Description
Server	Specifies the IP address of the AD domain server.
Status	Specifies whether to enable AD domain remote authentication. AD domain remote authentication is enabled by default. ● Enabled: AD domain authentication is enabled. If the configuration information is valid, AD domain authentication is enabled or AD domain users are synchronized to the bastion host when the user performs a login. ● Disabled: AD domain authentication is disabled.
SSL	Specifies whether to enable SSL encryption. SSL encryption is disabled by default. ● Disabled: SSL encryption is disabled. ● After SSL encryption is enabled, data transmitted by synchronized users or authenticated users is encrypted.
Mode	Specifies the working mode of AD domain. Select **Sync Mode**.
Port	Specifies the access port of the remote server of AD domain. The default port number is 389.

Parameter	Description
LoginName	Specifies the username of the account for logging in to the AD domain server.
Password	Specifies the password of the account for logging in to the AD domain server.
Domain	Specifies the domain of the AD service.
Base DN	Specifies the base DN for the remote AD domain server.
Dept Filter	Specifies the departments to be filtered out for the remote AD domain server.
User Filter	Specifies the users to be filtered out for the remote AD domain server.
Login Name Filter	Specifies the login name to be filtered out. Separate multiple login names with vertical bars (|).
UserName	Specifies the attribute name of user names on the remote AD domain server, for example, name.
Email	Specifies the attribute name of the user mailbox on the AD domain remote server, for example, mail.
Mobile	Specifies the attribute name of user's mobile phone on the AD domain remote server, for example, mobile.
Sync	Specifies the AD user synchronization method. The options include **Manual** and **Auto**. ● **Manual**: After you complete required configurations, manually synchronize the user information from the AD server. ● **Auto**: After you complete required configurations, user information is automatically synchronized. You are also required to configure **Start time of sync**, **Duration**, and **End time** for auto synchronization.
Department	Specifies the department to which the synchronized user account belongs.
Options	● **Override existing** – Selected: If an existing user account and the user account being imported have the same **LoginName**, the existing one will be overwritten. The user account information in the bastion host is updated accordingly. – Deselected: If an existing user account and the user account being imported have the same **LoginName**, the existing one will be skipped and kept unchanged. ● **Sync user status**: If you select this, the current user status will be synchronized to the bastion host. This option is recommended.

Step 5 (Optional) If you want to synchronize users from the AD domain server, click **Next** to obtain the source department structure of the AD domain server.

- **Sync All Users** is enabled by default.
- If you select a superior department of the user source, all users in the lower-level department are included in the source.
- **Create new dept** is disabled by default. You can enable it to let system create departments based on the department structure in the AD domain and synchronize users from the AD domain departments.

Step 6 Click **OK**. You can then view AD authentication configurations in the AD server list.

Step 7 In the **AD Settings** area, locate the AD server row. In the **Operation** column, click **Start** to synchronize AD domain users to a bastion host. You can view the synchronized user information in the user list.

----End

5.2.2 Enabling or Disabling a User

You can batch **Enable** or **Disable** other users and change the user account status in just a few clicks.

The system administrator **admin** is **Enabled** by default and cannot be disabled.

- Enable

  The default user status is **Enabled**. Enabled users can use the bastion host within the permission scope.
- Disable

  The user account status is changed to **Disabled**. Disabled users cannot log in to the bastion host. A logged-in user will be forcibly logged out when the mapped user account is disabled.

Prerequisites

You have the operation permissions for the **User** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **User** > **User** in the navigation pane.

Step 3 Select the users whose status you want to change and click **Enable** or **Disable** in the lower left corner. This operation takes effect immediately.

----End

5.2.3 Deleting a User

You can delete users one by one or in batches from a bastion host.

After a user account is deleted, the user has no permissions, and files in the user's personal net disk are cleared.

The system administrator **admin** cannot be deleted.

Prerequisites

You have the operation permissions for the **User** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **User** > **User** in the navigation pane.

Step 3 To delete one user, click **Delete** in the **Operation** column of the user.

Step 4 To delete multiple users at a time, select the ones you want to delete and click **Delete** at the bottom of the user list.

----End

5.2.4 Configuring User Login Restrictions

Overview

To effectively reduce security risks caused by user account leakage, you can enable or disable multifactor verification, set the account validity period, and configure login limit by time range, IP address, and MAC address.

- Multifactor verification: authenticates user login by SMS, OTP token, or USB key as well as password.
- Period of validity: determines the validity period of a user account for logging in to a bastion host.
- Login limit by time: allows or forbids a user account to log in to a bastion host at the specified duration.
- Login limit by IP address: allows or forbids only users from specified IP addresses to log in to a bastion host.
- Login limit by MAC address: allows or forbids only users with specified MAC addresses on a LAN to log in to a bastion host.

Constraints

- To use the **Mobile OTP** authentication, ensure that the system time and the mobile phone system time are synchronized, accurate to the seconds. Otherwise, the mobile OTP authentication will fail.
- The built-in SMS gateway has restrictions on the frequency and number of SMS messages that can be sent. To avoid these restrictions, use a third-party SMS gateway. For more details, see **Configuring SMS Message Outgoing**.
- MAC addresses belong to the data link layer and are used for LAN addressing. The parameter **MAC Limit** takes effect only on the LAN.
- If multifactor verification is configured for the **admin** user, the first time login will fail. Submit a service ticket for technical support to deselect all multifactor verification options.

Prerequisites

- You have the operation permissions for the **User** module.
- To enable **Mobile OTP** in multifactor verification, **bind a mobile OTP** to the user account in **Profile**. Otherwise, the user account cannot be used to log in to the system.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **User** > **User** in the navigation pane.

Step 3 Click the login name of the user whose information you want to change, or click **Manage** in the row of the user in the **Operation** column.

Step 4 Click **Edit** in the **User Setting** area.

Table 5-4 User login limit parameters

Parameter	Description
Multifactor Verification	Specifies the authentication methods for users to log in to the bastion host. The options are **Mobile SMS**, **Mobile OTP**, **USBKey**, and **OTP token**. ● By default, all options are deselected. If no options are selected, only the local password is used for identity authentication. ● **Mobile SMS**: Mobile SMS can be enabled in multifactor verification only after a mobile number is bound to the user account for receiving SMS messages. ● **Mobile OTP**: To make the mobile OTP authentication take effect, **bind a mobile OTP** to the user account in **Profile** first. ● **USBKey**: To make the USBKey multifactor verification take effect, relate the user account to an issued USB Key. For details, see **Issuing a USB Key**. ● **OTP token**: To make the OTP token authentication take effect, relate the user account to an OTP token. For details, see **Issuing an OTP Token**.
IAM Login	If you enable this, you can directly log in to the bastion host from IAM.
Period of validity	Specifies the validity period of the user account.
Logon Time Limit	Specifies the allowed or forbidden login time range. The time limit is set by the day and the hour.

Parameter	Description
Edit IP limit	Specifies the IP address or IP address range to be blacklisted or whitelisted. ● **Blacklist**: forbids all user logins from the specified IP address or IP address range. ● **Whitelist**: allows only user logins from the specified IP address or IP address range. ● **Blacklist-Multifactor Verification for within the List**: allows you to configure the IP address or IP address range for the blacklist. Users whose IP addresses or IP address ranges are in the blacklist are allowed to log in to the bastion host only when multifactor verification is configured for them. ● **Blacklist-Multifactor Verification for beyond the List**: allows you to configure the IP address or IP address range for the whitelist. Users whose IP addresses or IP address ranges are not in the whitelist are allowed to log in to the bastion host only when multifactor verification is configured for them. ● If no IP address is specified, there is no IP-based login limit.
MAC Limit	Specifies the MAC address or address range to be blacklisted or whitelisted. ● **Blacklist**: forbids all users from configured MAC addresses to log in to the bastion host. ● **Whitelist**: allows only users from configured MAC addresses to log in to the bastion host. ● If no MAC address is specified, there is no login limit by MAC address.

Step 5 Click **OK**. You can view the user login configurations on the user details page.

----End

Batch Changing User Login Configurations

Step 1 Log in to your bastion host.

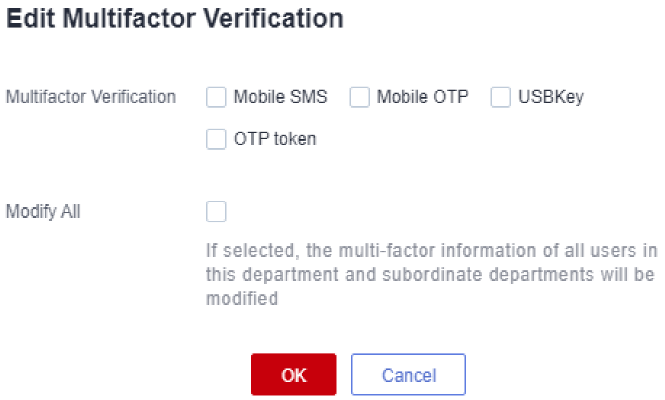
Step 2 In the navigation pane on the left, choose **User** > **User** to go to the user list page.

Step 3 Select the user accounts you want to edit and click **More** in the lower left corner.

Step 4 Edit or disable multifactor verification configuration for several users at a time.

1. Click **Edit multifactor**.

Figure 5-2 Batch editing multifactor verification


Edit Multifactor Verification

Multifactor Verification □ Mobile SMS □ Mobile OTP □ USBKey □ OTP token

Modify All □

If selected, the multi-factor information of all users in this department and subordinate departments will be modified

2. In the displayed **Edit Multifactor Verification** dialog box, select or deselect one or more multifactor verification methods.
3. Click **OK**.

Step 5 Edit or disable period of validity for several users at a time.

1. Click **Edit validity period**.
2. In the displayed **Edit period of validity** dialog box, select **Edit StartTime** or **Edit EndTime** and specify the time. If you deselect the check box, the corresponding validity period configuration is disabled.
3. Click **OK**.

Step 6 Edit login limit configurations for several users at a time.

1. Click **Edit time limit**.
2. In the displayed **Edit time limit** dialog box, select **Allowed** or **Forbidden** and specify time limit by the day and hour.
3. Click **OK**.

Step 7 Edit or disable IP address login limit for several users at a time.

1. Click **Edit IP limit**.
2. In the displayed **Edit IP limit** dialog box, select **Blacklist** or **Whitelist** and enter or delete the IP address or address range.
3. Click **OK**.

Step 8 Edit or disable the MAC login limit for several users at a time.

1. Click **Edit MAC limit**.
2. In the displayed **Edit MAC limit** dialog box, select **Blacklist** or **Whitelist** and enter or delete the MAC address.
3. Click **OK**.

----End

5.2.5 Querying and Editing User Information

When there are a large number of users in a bastion host, the quick search and advanced search modes are available for you.

You can query, view, and edit user information, including basic user and user group information, login restrictions, authorized resource accounts, multifactor verification methods, and the validity period of user accounts.

Prerequisites

You have the operation permissions for the **User** module.

Querying a User

Step 1 Log in to your bastion host.

Step 2 Choose **User** > **User** in the navigation pane.

Step 3 Quick search

Enter a keyword in the search box and search for a user by login name or username.

Step 4 Advanced search

Enter keywords in the corresponding attribute search boxes to search for users in exact mode.

----End

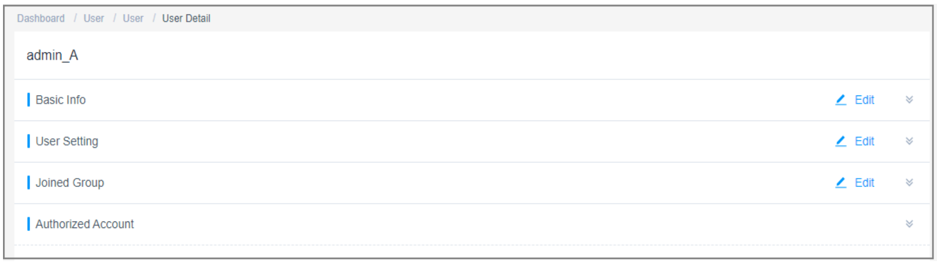
Viewing and Editing User Information

Step 1 Log in to your bastion host.

Step 2 Choose **User** > **User** in the navigation pane.

Step 3 In the user list, click the login name of the user you want, or click **Manage** in the row of the user in the **Operation** column.

Figure 5-3 User details

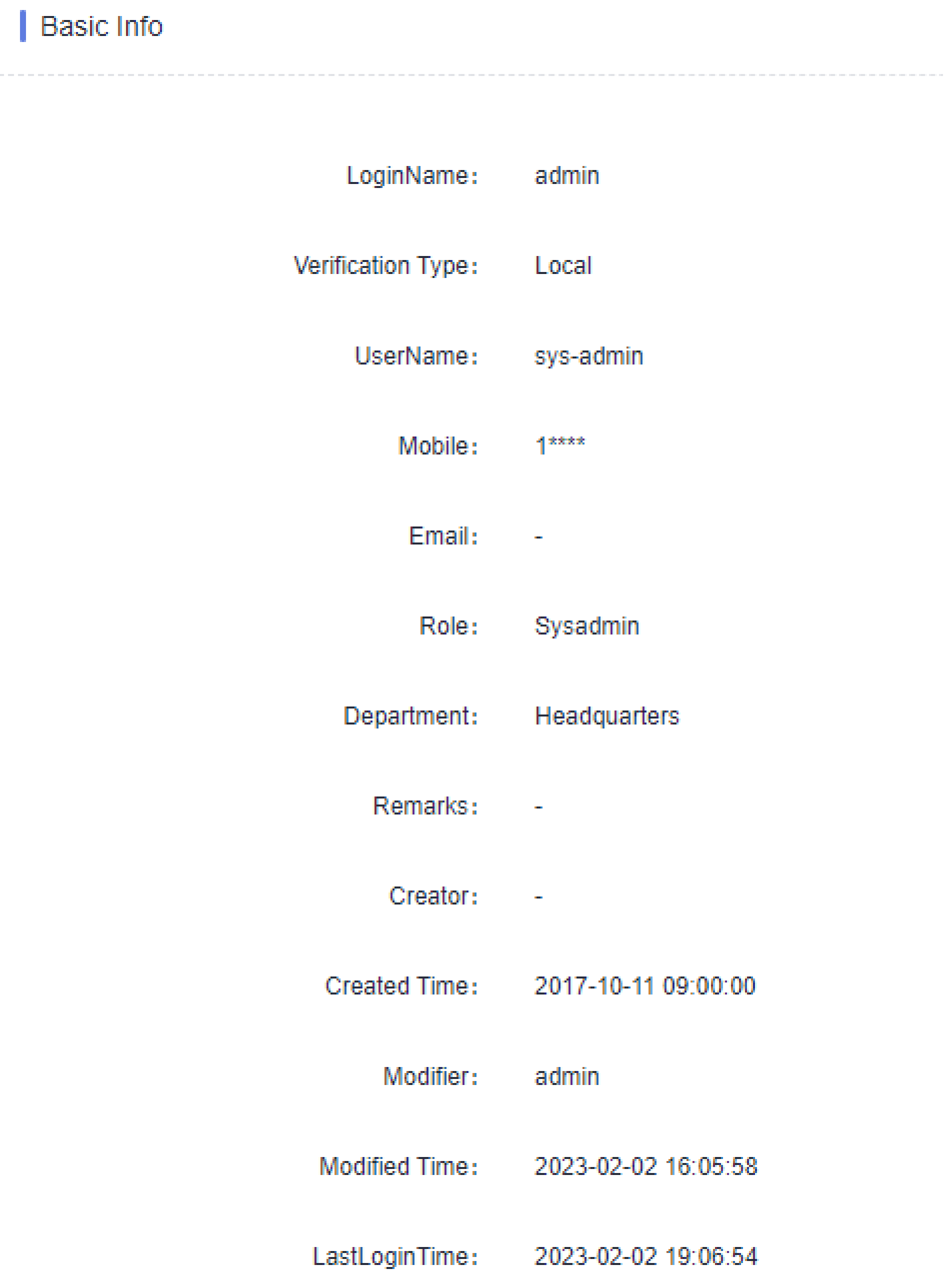


Step 4 Edit basic information.

In the **Basic Info** area on the displayed page, click **Edit**. In the displayed dialog box, edit the user information.

- You can edit **Verification Type**, **UserName**, **Mobile**, **Email**, **Role**, **Department**, and **Remarks**.
- The value of **LoginName** cannot be changed.

Figure 5-4 Basic user information



Basic Info

LoginName： admin

Verification Type： Local

UserName： sys-admin

Mobile： 1****

Email： -

Role： Sysadmin

Department： Headquarters

Remarks： -

Creator： -

Created Time： 2017-10-11 09:00:00

Modifier： admin

Modified Time： 2023-02-02 16:05:58

LastLoginTime： 2023-02-02 19:06:54

Step 5 Edit user login configurations.

In the **User Setting** area on the displayed page, click **Edit**. In the displayed dialog box, edit the login configurations.

Step 6 View and change the user group to which a user belongs.

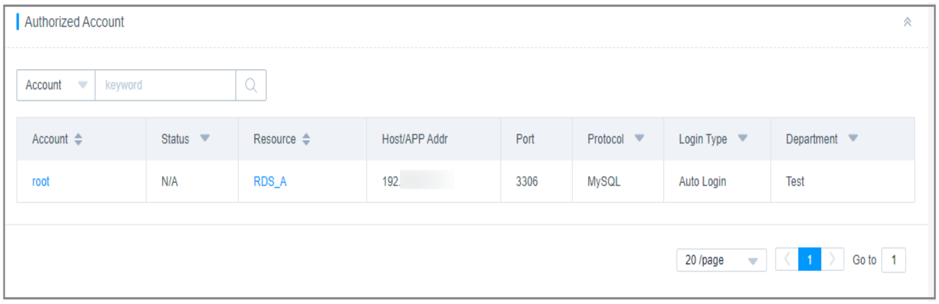
- In the **Joined Group** area, view the user group to which the user belongs.
- Click **Edit**. In the displayed dialog box, change the user group to which the user belongs.

- In the **Operation** column, click **Remove** to remove the user from the user group.

Step 7 View the authorized accounts and resources.

Expand the **Authorized Account** area to view resource accounts that can be used by the user.

Figure 5-5 Authorized Account



Account	Status	Resource	Host/APP Addr	Port	Protocol	Login Type	Department
root	N/A	RDS_A	192[redacted]	3306	MySQL	Auto Login	Test

----End

Batch Editing User Information

Step 1 Log in to your bastion host.

Step 2 Choose **User** > **User** in the navigation pane.

Step 3 In the user list, select the users you want to edit and click **More** in the lower left corner.

Step 4 Edit department of multiple selected hosts at a time.

1. Click **Edit Dept**.
2. In the displayed dialog box, select a department.
3. Click **OK**.

Step 5 Edit role of several users at a time.

1. Click **Edit Role**.
2. In the displayed dialog box, select a role you want.
3. Click **OK**.

----End

5.2.6 Changing User Login Passwords

Forgotten, lost, or expired passwords may cause login security accidents. To reduce password login risks, you can change user login passwords in batches.

Constraints

- You are not allowed to change the password of system administrator **admin**. It can only be changed in the **Profile** module as user **admin**.
- If your password is changed by batch resetting, change the password when the first time you log in to the bastion host after password resetting. This is

because the same password is generated for all selected users during password batch resetting.

- After you log in to a bastion host, only the passwords of other users can be batch reset.
- Plaintext passwords cannot be viewed or exported.
- For users with remote authentication enabled, their passwords can be changed only on the remote authentication server.

Prerequisites

You have the operation permissions for the **User** module.

Procedure

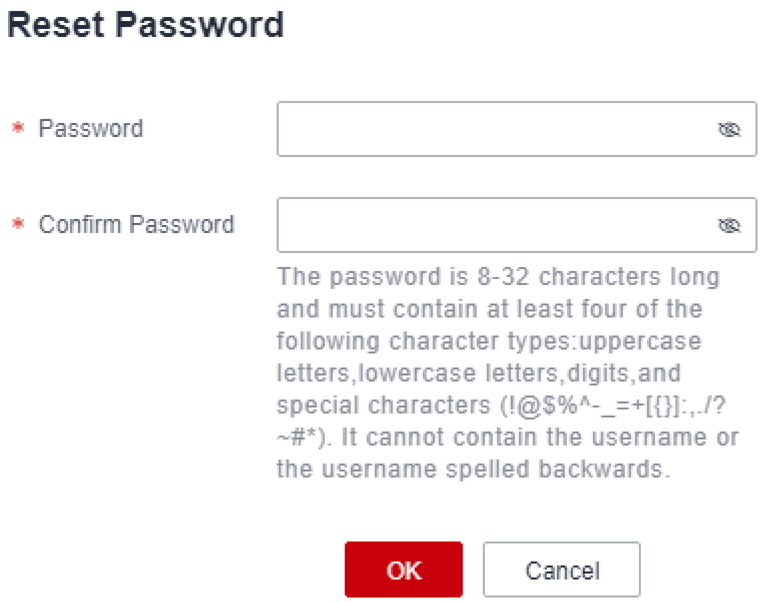
Step 1 Log in to your bastion host.

Step 2 In the navigation pane on the left, choose **User** > **User** to go to the user list page.

Step 3 Select the user accounts you want to edit and click **More** in the lower left corner.

Step 4 Click **Reset Password**.

Figure 5-6 Reset Password



Reset Password

* Password

* Confirm Password

The password is 8-32 characters long and must contain at least four of the following character types:uppercase letters,lowercase letters,digits,and special characters (!@$%^-_=+[{}]:,./?~#*). It cannot contain the username or the username spelled backwards.

Step 5 Set the password.

Step 6 Click **OK**.

Be sure that involved users are notified of new passwords in a timely manner.

----End

5.2.7 Exporting User Information

You can export user information in batches so that you can have a local backup and edit basic user information easily.

Constraints

- You can export user information about login name, authentication method, authentication server, username, mobile number, email address, role, department, and user group.
- To ensure user account security, passwords cannot be exported.

Prerequisites

You have the operation permissions for the **User** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 In the navigation pane on the left, choose **User** > **User** to go to the user list page.

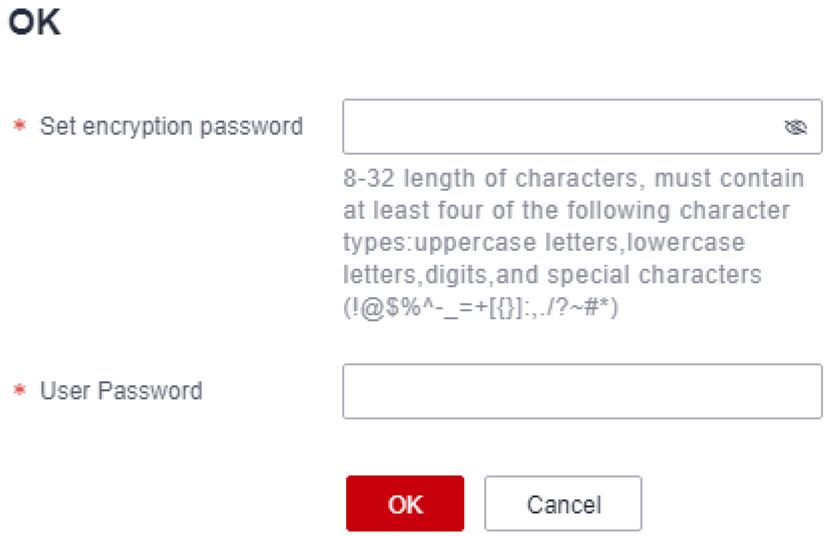
Step 3 Select the user accounts you want to export.

If no users are selected, all user accounts are exported by default.

Step 4 Click **Export**. In the displayed **OK** dialog box:

- Enter your password.
- (Optional) Set the encryption password to encrypt the exported file.

Figure 5-7 Confirmation dialog box



OK

* Set encryption password

8-32 length of characters, must contain at least four of the following character types:uppercase letters,lowercase letters,digits,and special characters (!@$%^-_=+[{}]:,./?~#*)

* User Password

Step 5 Click **OK** to save the user information locally.

Step 6 Open the local file to view the exported basic user information.

----End

5.2.8 Adding Users to a User Group

This topic describes how to add a user to a user group. A user can be added to multiple user groups.

Constraints

- The administrator of a superior department can add a user in the superior department to a user group in a lower-level department.
- If you have the permissions for the **User** module, you can remove a user of a superior department out of a user group. However, as a user in a lower-level department, you have no permissions to add those removed users back to the user group.

Prerequisites

You have the operation permissions for the **User** module.

Adding a User to a User Group

Step 1 Log in to your bastion host.

Step 2 In the navigation pane on the left, choose **User** > **User** to go to the user list page.

Step 3 In the **Operation** column of the user you want, click **Join**.

Step 4 In the displayed **Edit UserGroup** dialog box, select one or more user groups and add the user to selected user groups.

Step 5 Click **OK**. You can then view the user groups the user has been added.

----End

Adding Multiple Users to a User Group

Step 1 Log in to your bastion host.

Step 2 In the navigation pane on the left, choose **User** > **User Group** to go to the user group list page.

Step 3 In the **Operation** column of the user group you want to add users to, click **Member**.

Step 4 In the displayed **Edit UserGroup** dialog box, select multiple user accounts and add them to the user group.

Step 5 Click **OK**. You can view the added members on the **User Group** page.

----End

5.3 User Role Management

5.3.1 Overview

You can relate different roles to different users to let them have certain permissions for the bastion host.

In a bastion host, only **admin** has the permission to customize roles and modify permissions for roles.

In a bastion host, default roles include **DepartmentManager**, **PolicyManager**, **AuditManager**, and **User**. The default roles cannot be deleted, but you can change the permissions of the default roles.

Table 5-5 Default roles

Parameter	Description
DepartmentManager	Specifies the operation administrator of the department, who manages the bastion host system. **DepartmentManager** has the configuration permissions for all other modules except **User** and **Role** modules.
PolicyManager	Specifies the user permission policy administrator. This role manages host operation permissions. It has the permissions for configuration of the user management, resource group management, and access policy management modules.
AuditManager	Specifies the O&M result audit administrator. This role queries and manages system audit data. This role has the configuration permissions for real-time session, historical session, and system logs modules.
User	Specifies common users and operators. This role has the permissions for O&M of resources, such as host and application resources, and service ticket authorization management.

5.3.2 Creating a Custom Role

In a bastion host, default roles include **DepartmentManager**, **PolicyManager**, **AuditManager**, and **User**. This topic walks you through how to create a custom role.

Constraints

- Only system administrator **admin** can create a system role.
- To obtain permissions for the user group and account group modules, configure the **User** and **Account** modules.

Creating a Role

Step 1 Log in to your bastion host.

Step 2 In the navigation pane on the left, choose **User** > **Role** to go to the role list page.

Step 3 On the displayed page, click **New** in the upper right corner of the page. In the displayed **New Role** dialog box, complete required parameters

Table 5-6 Parameters for creating a role

Parameter	Description
Role	Specifies the role name. The value of **Role** must be unique in a bastion host and cannot be changed after it is created.
Managing Permission	Specifies whether to enable permission management for the role. Users assigned with management permissions can select a superior department when they create a resource or user. ● **Enable**: The role has the management permissions and users with this role granted can view the data of their departments and lower-level departments. ● **Disable**: The role has no management permissions.
Remarks	(Optional) Provides supplementary information about the role.

Step 4 Click **Next**. In the displayed dialog box, configure system module permissions for the role.

- Select a system module and specific actions: the role has permissions for the module and selected actions.
- Select only a system module: The role has only the permission to view the module.

Step 5 Click **OK**. You can then view the created role in the role list.

----End

5.3.3 Deleting a Role

This topic describes how to delete a role.

Constraints

- Only system administrator **admin** can delete a system role.
- Default system roles cannot be deleted.

Procedure

Step 1 Log in to your bastion host.

Step 2 In the navigation pane on the left, choose **User** > **Role** to go to the role list page.

Step 3 To delete a single role, click **Delete** in the **Operation** column.

Step 4 To delete multiple roles at a time, select the ones you want to delete and click **Delete** at the bottom of the role list.

----End

5.3.4 Querying and Editing Role Information

You can log in to your bastion host as user **admin** to view or role change details, including basic role information, role permissions, and module information.

Constraints

- Only system administrator **admin** can view and edit a system role.
- Management permissions of a default system role cannot be edited.
- If you change the permissions of a system default role, you can restore default permissions in just a few clicks.

Procedure

Step 1 Log in to your bastion host.

Step 2 In the navigation pane on the left, choose **User** > **Role** to go to the role list page.

Step 3 Query a role.

Enter a keyword in the search box and search for a role by name.

Step 4 Click the name of a desired role and click **Manage** in the **Operation** column.

Step 5 In the **Basic Info** area, view the detailed information about the role.

Click **Edit** and modify the basic information.

Step 6 In the **Permissions** area, view the system operation permissions of the role.

- Click **Edit**. In the displayed dialog box, modify the system operation permissions of the role.
- Click **Remove** of a module to revoke permissions for the module of the role.

----End

5.4 User Group Management

5.4.1 Overview

A user group includes multiple users. You can authorize users in batches by authorizing the corresponding user group. For details, see **Creating an ACL Rule and Associating It with Users and Resource Accounts**.

Only system administrator **admin** or the users with the permissions for the **User** module can manage user groups, including creating a user group, maintaining members in the user group, managing user group information, and deleting the user group.

A user group is associated with a department and does not belong to an individual user. By default, a user group created by the current login user belongs to the department of the user. The department cannot be changed. Users who have the user group permissions can only view the information about all the user groups of their departments and lower-level departments.

NOTE

- The administrator of a superior department can add a user in the superior department to a user group in a lower-level department.
- If you have the permissions for the **User** module, you can view user group details. However, for the user groups in the superior department, you can view only the user list of the user group.
- If you have the permissions for the **User** module, you can remove a user of a superior department out of a user group. However, as a user in a lower-level department, you have no permissions to add those removed users back to the user group.
- A user can be added to multiple user groups.

5.4.2 Creating a User Group

This section describes how to create a user group.

Prerequisites

You have the operation permissions for the **User** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 In the navigation pane on the left, choose **User** > **User Group** to go to the user group list page.

Step 3 Click **New**. In the **New UserGroup** dialog box displayed, configure basic information about the group.

Table 5-7 Creating a User Group

Parameter	Description
User Groups	Specifies user-defined user group name, which must be unique in a bastion host.
Remarks	(Optional) Provides supplementary information about the user group.

Step 4 Enter a user group name and descriptions in the **Group** and **Remarks** fields, respectively. The user group name in a bastion host must be unique.

Step 5 Click **OK**. You can then view the newly created user group in the user group list and add members to it. For details, see **Adding Users to a User Group**.

----End

5.4.3 Deleting a User Group

You can delete user groups from a bastion host. After a user group is deleted, the resource permissions the group members have been granted through the user group become invalid.

Prerequisites

You have the operation permissions for the **User** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **User** > **User Group** in the navigation pane.

Step 3 To delete a single user group, click **Delete** in the **Operation** column of the user group.

Step 4 To delete multiple user groups at a time, select the ones you want and click **Delete** at the bottom of the user group list.

----End

5.4.4 Querying and Editing User Group Information

You can view and edit basic information and members of a user group.

Constraints

- If you have the permissions for the **User** module, you can view user group details. However, for the user groups in the superior department, you can view only the user list of the user group.
- If you have the permissions for the **User** module, you can remove a user of a superior department out of a user group. However, as a user in a lower-level department, you have no permissions to add those removed users back to the user group.

Prerequisites

You have the operation permissions for the **User** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **User** > **User Group** in the navigation pane.

Step 3 Query a user group.

Enter a keyword in the search box and search for a user group by name.

Step 4 Click the name of the user group you want to edit or click **Manage** in the row of the user group in the **Operation** column.

Step 5 In the **Basic Info** area, view the detailed information about the user group.

Click **Edit** in the area to modify the name and remarks of the user group.

Step 6 In the **Members** area, view information about all members in the user group.

- Click **View** to go to the details page.

- In the row of a specific member, click **Remove** in the **Operation** column to remove the user from the user group.

----End

5.4.5 Editing the Members of a User Group

This section describes how to add members to or remove members from a user group.

Constraints

- If you have the permissions for the **User** module, you can view user group details. However, for the user groups in the superior department, you can view only the user list of the user group.
- If you have the permissions for the **User** module, you can remove a user of a superior department out of a user group. However, as a user in a lower-level department, you have no permissions to add those removed users back to the user group.

Prerequisites

You have the operation permissions for the **User** module.

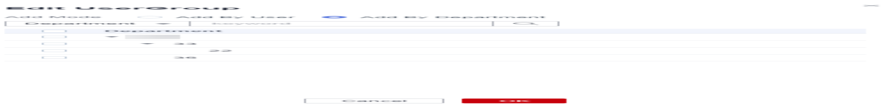
Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **User** > **User Group** in the navigation pane.

Step 3 In the **Operation** column of the user group you want to edit, click **Member**.

Figure 5-8 Editing the members of a user group



Step 4 In the displayed dialog box, select **Add By User** or **Add By Department**.

Step 5 After selecting a user or department, click **OK**.

----End

5.5 Remote Authentication Management

5.5.1 Configuring Remote AD Authentication

You can interconnect your bastion host with the AD server to authenticate user logins. You can enable authentication mode or synchronization mode for the AD domain service.

- Auth Mode

If this mode is selected, your bastion host does not synchronize user information from the AD domain server. You need to log in to the bastion host as the administrator and create system users manually. When a user logs in to your bastion host, its identity is authenticated by the AD domain server.

- Sync Mode

  If this mode is selected, your bastion host synchronizes user information from the AD domain server. So, there is no need to create system users additionally. When a user logs in to your bastion host, its identity is authenticated by the AD domain server. For details, see **Synchronizing AD Domain Users**.

This topic describes how to configure the AD authentication mode.

Prerequisites

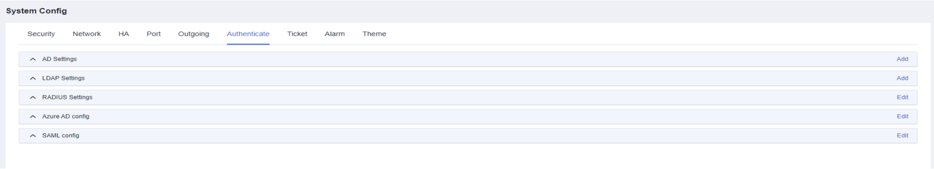
- You have the management permissions for the **System** module.
- You have obtained the information about the AD domain server.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Authenticate**.

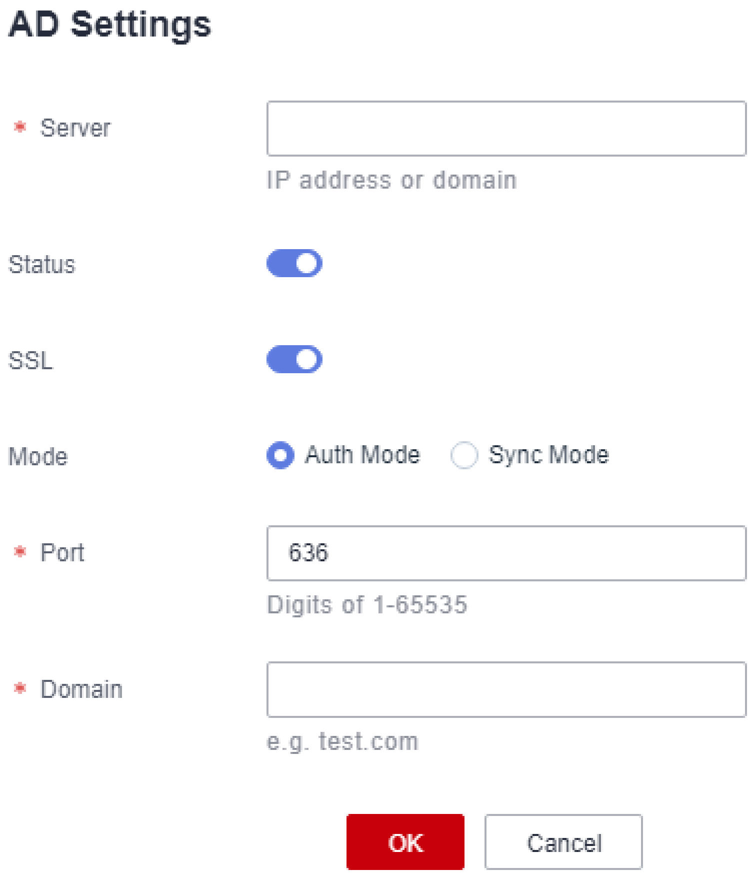
Figure 5-9 Configuring remote authentication



Step 3 Click **Add** in the **AD Settings** area.

Step 4 Select **Auth** for **Auth Mode** and configure other parameters as shown in **Table 5-8**.

Figure 5-10 AD Settings



AD Settings

* Server

IP address or domain

Status ●

SSL ●

Mode ● Auth Mode ○ Sync Mode

* Port 636

Digits of 1-65535

* Domain

e.g. test.com

Table 5-8 AD authentication parameters

Parameter	Description
Server	Specifies the IP address of the AD domain server.
Status	Specifies the status of remote AD authentication (default: ●). - ●: AD domain authentication is enabled. If the configuration information is valid, AD domain authentication is enabled or AD domain users are synchronized to the bastion host when the user starts a login. - ○: AD authentication is disabled.
SSL	Specifies the status of SSL encryption (default: ○). - ○: SSL encryption is disabled. - ●: SSL encryption is enabled. After SSL encryption is enabled, data transmitted by synchronized users or authenticated users is encrypted.
Mode	Specifies the working mode of AD domain. Select **Auth Mode**.

Parameter	Description
Port	Specifies the access port of the remote server of AD domain. The default port number is 389.
Domain	Specifies the domain of the AD service.

Step 5 Click **OK**. You can then view AD authentication configurations in the AD server list.

----End

Follow-up Operations

- To view details of the configured AD authentication, click **Details** in the **Operation** column.
- To modify or disable AD authentication, or change the authentication mode, click **Edit** in the **Operation** column and reconfigure the AD authentication in the displayed dialog box.
- If the AD authentication is no longer required, click **Delete** in the **Operation** column to delete it. Deleted authentication information cannot be recovered. Exercise caution when performing this operation.

5.5.2 Configuring Remote LDAP Authentication

You can interconnect your bastion host with the LDAP server to authenticate logins to the bastion host.

This topic describes how to configure the LDAP authentication mode.

Constraints

- One-click synchronization of LDAP server users is not supported.
- Identical configurations of two LDAP authentication servers are not allowed. Each LDAP server has unique combination of IP address, port number, and user OU.

Prerequisites

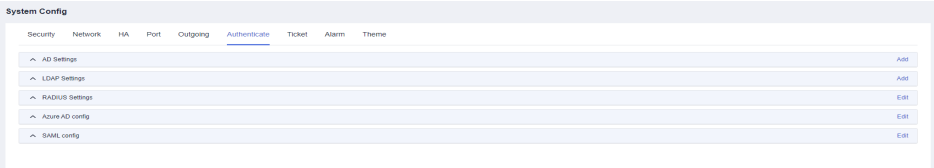
- You have the management permissions for the **System** module.
- You have obtained the information about the LDAP server.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Authenticate**.

Figure 5-11 Configuring remote authentication

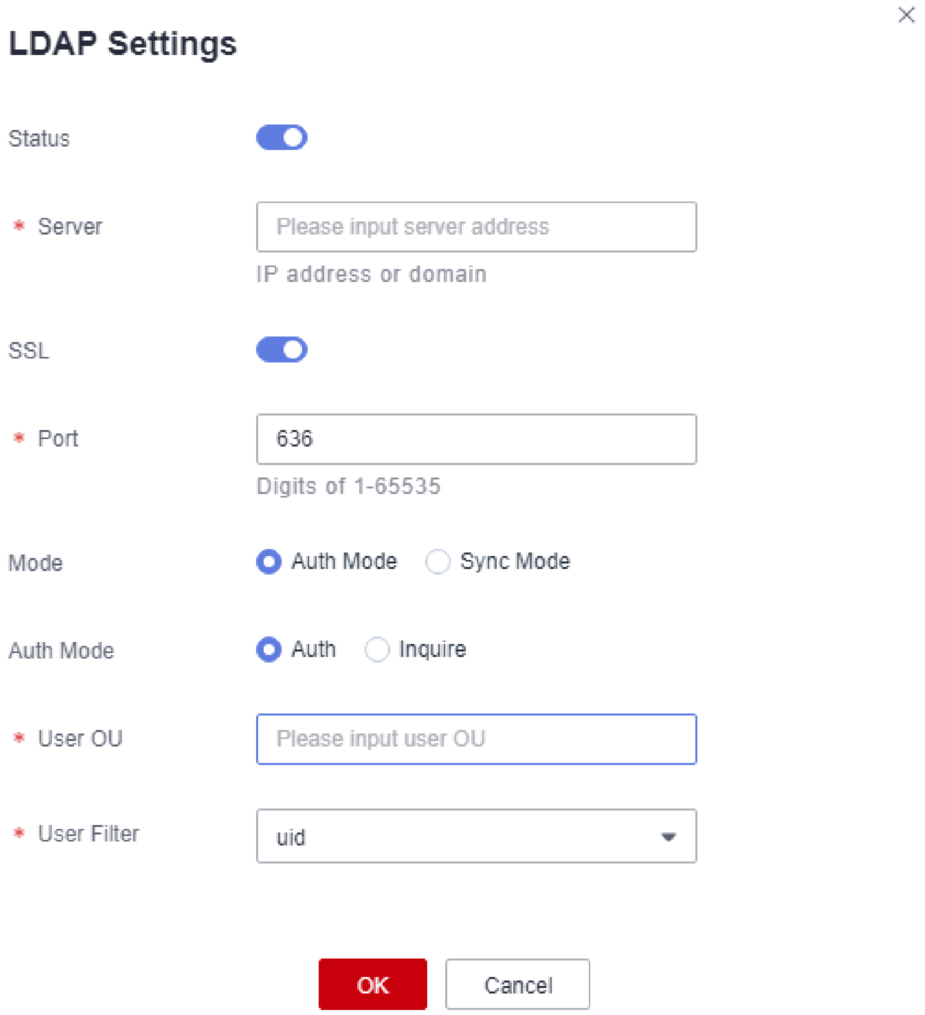


Step 3 Click **Add** in the **LDAP Settings** area.

LDAP supports the two authentication modes:

- If you select **Auth** for **Auth Mode**, configure the parameters by referring to **Table 5-9**.

Figure 5-12 Configuring LDAP authentication



LDAP Settings

Status: on

* Server: Please input server address
IP address or domain

SSL: on

* Port: 636
Digits of 1-65535

Mode: ● Auth Mode ○ Sync Mode

Auth Mode: ● Auth ○ Inquire

* User OU: Please input user OU

* User Filter: uid

Table 5-9 LDAP authentication parameters

Paramete r	Description
Server	Specifies the IP address of the LDAP server.

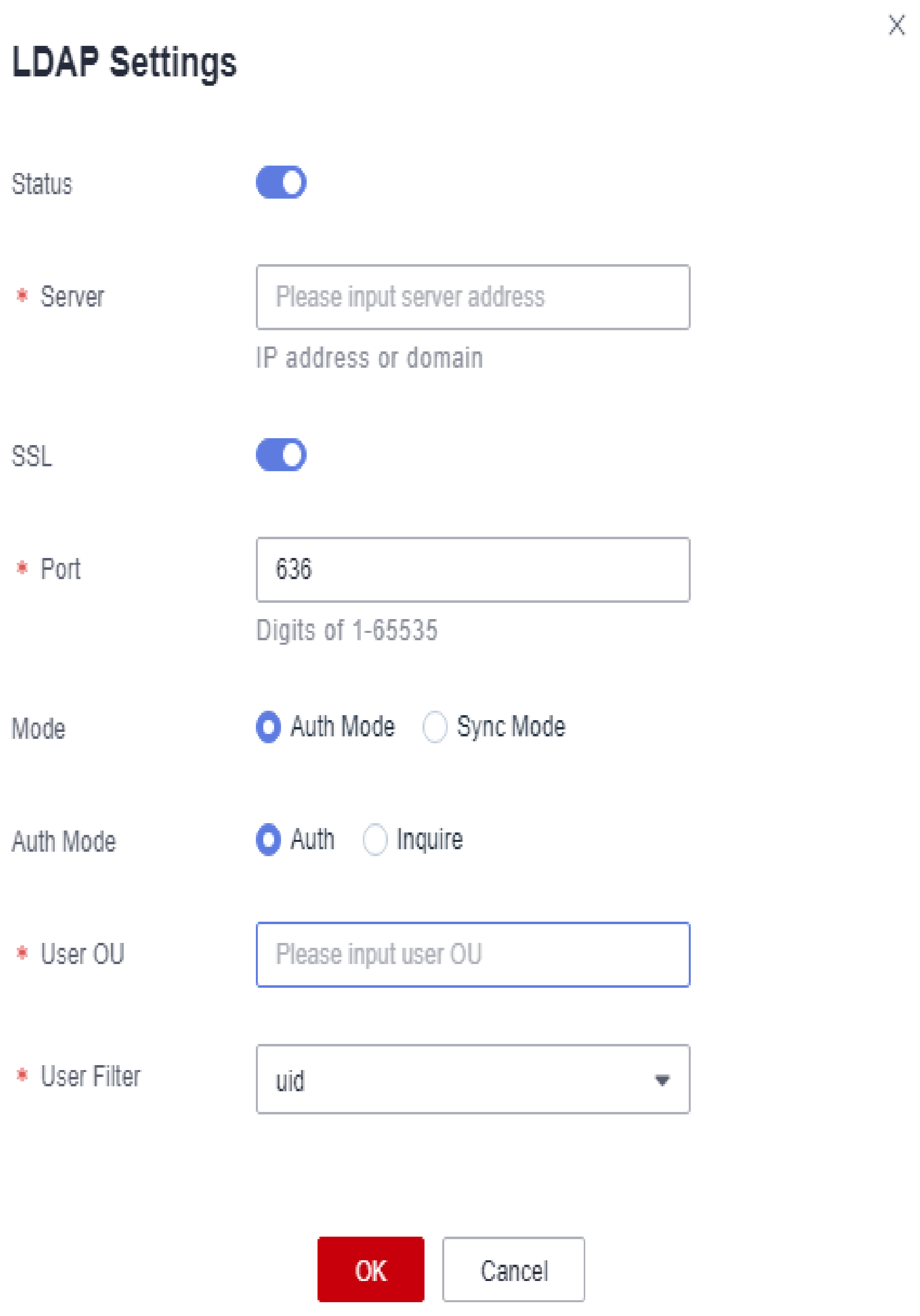
Parameter	Description
Status	Specifies whether to enable remote LDAP authentication. Remote LDAP authentication is enabled by default (●). – ●: LDAP authentication is enabled. Remote LDAP authentication is enabled when a user starts a login. – ○: LDAP authentication is disabled.
SSL	Specifies whether to enable SSL encryption. SSL encryption is disabled by default (○). – ○: SSL encryption is disabled. – ●: SSL encryption is enabled. After SSL encryption is enabled, data transmitted by synchronized users or authenticated users is encrypted.
Port	Specifies the access port of the remote LDAP server. The default port number is 389.
Mode	Select **Auth Mode** or **Sync Mode**. – **Auth Mode**: The bastion host is interconnected with the AD server. To add a domain user, you need to manually select LDAP authentication on the user management page. – **Sync Mode**: After the bastion host is connected to the AD server, you can choose **Systemconfig** > **Authenticate** and synchronize users under the corresponding OU to the bastion host.
User OU	Specifies the user organization unit (OU) on the LDAP server.
User Filter	Specifies the users to be filtered out on the LDAP server.

- Select **Auth** for **Auth Mode** and configure the parameters by referring to **Table 5-10**.

NOTE

Querying authentication methods is supported in version version 3.3.36.0 and later only. To use this function, upgrade your bastion host to version 3.3.36.0 or later by referring to **Upgrading the CBH System Version**.

Figure 5-13 Inquire



LDAP Settings

Status: ● On

* Server: Please input server address
IP address or domain

SSL: ● On

* Port: 636
Digits of 1-65535

Mode: ● Auth Mode ○ Sync Mode

Auth Mode: ● Auth ○ Inquire

* User OU: Please input user OU

* User Filter: uid

Table 5-10 LDAP inquiring mode parameters

Parameter	Description
Server	Specifies the IP address of the LDAP server.

Parameter	Description
Status	Specifies whether to enable remote LDAP authentication. Remote LDAP authentication is enabled by default (●). – ●: LDAP authentication is enabled. Remote LDAP authentication is enabled when a user starts a login. – ○: LDAP authentication is disabled.
SSL	Specifies whether to enable SSL encryption. SSL encryption is disabled by default (○). – ○: SSL encryption is disabled. – ●: SSL encryption is enabled. After SSL encryption is enabled, data transmitted by synchronized users or authenticated users is encrypted.
Port	Specifies the access port of the remote LDAP server. The default port number is 389.
Mode	Select **Auth Mode** or **Sync Mode**. – The bastion host is interconnected with the AD server. To add a domain user, you need to manually select LDAP authentication on the user management page. – After the CBH instance is connected to the AD server, you can choose **Systemconfig** > **Authenticate** and synchronize users under the corresponding OU to the bastion host.
Base DN	Base DN of the LDAP server.
Administrator DN	Administrator DN.
Administrator Password	Password of the administrator.
User OU	Specifies the user organization unit (OU) on the LDAP server.
User Filter	Specifies the users to be filtered out on the LDAP server.

Step 4 Click **OK**. You can then view LDAP authentication configurations in the LDAP server list.

----End

Follow-up Operations

- To view details of the configured LDAP authentication, click **Details** in the **Operation** column.
- To modify or disable LDAP authentication, click **Edit** in the **Operation** column and reconfigure LDAP authentication in the displayed dialog box.

- If the LDAP authentication is no longer required, click **Delete** in the **Operation** column to delete it. Deleted authentication information cannot be recovered. Exercise caution when performing this operation.

5.5.3 Configuring Remote RADIUS Authentication

You can interconnect your bastion host with the RADIUS server to authenticate logins to your bastion host.

This topic describes how to configure the RADIUS authentication and how to test the user validity of the configured RADIUS authentication.

Prerequisites

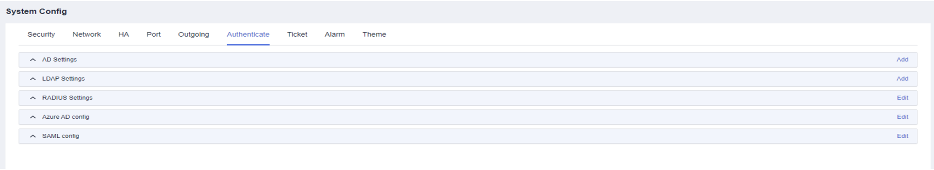
- You have the management permissions for the **System** module.
- You have obtained the information about the RADIUS server.

Procedure

Step 1 Log in to your bastion host.

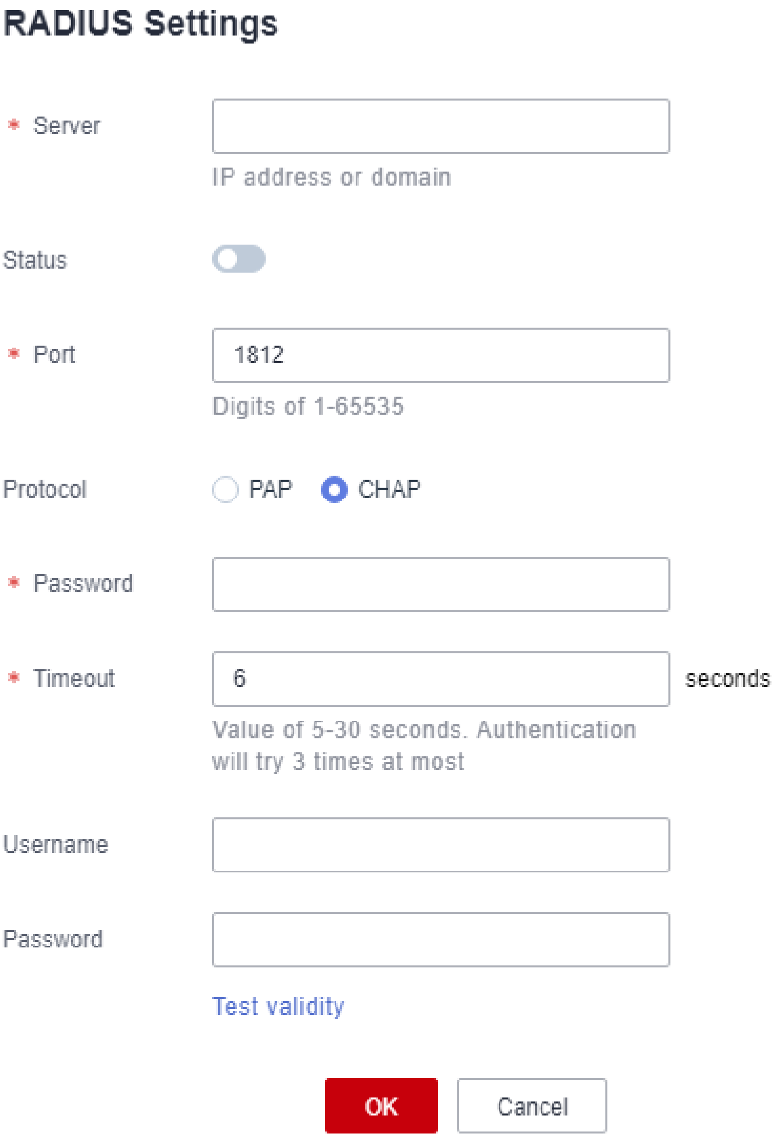
Step 2 Choose **System** > **Sysconfig** > **Authenticate**.

Figure 5-14 Configuring remote authentication



Step 3 Click **Edit** in the **RADIUS Settings** area.

Figure 5-15 RADIUS Settings



RADIUS Settings

* Server
IP address or domain

Status ○

* Port 1812
Digits of 1-65535

Protocol ○ PAP ● CHAP

* Password

* Timeout 6 seconds
Value of 5-30 seconds. Authentication will try 3 times at most

Username

Password

Test validity

Table 5-11 RADIUS authentication parameters

Parameter	Description
Server	Specifies the IP address of the RADIUS server.
Status	Specifies the status of remote RADIUS authentication (default: ○). ● ●: RADIUS authentication is enabled. Remote RADIUS authentication is enabled when the user starts a login. ● ○: RADIUS authentication is disabled.
Port	Specifies the access port of the remote RADIUS server. The default port number is 1812.

Parameter	Description
Protocol	Specifies the remote authentication protocol. This parameter can be set to **PAP** or **CHAP**.
Password	Specifies the authentication key of the remote RADIUS server.
Timeout	Specifies the timeout for remote RADIUS authentication.
Username	Specifies the username on the RADIUS server to test whether the RADIUS server information is correct.
Password	Specifies the password of username on the RADIUS server to test whether the RADIUS server information is correct.
Test validity	You can click **Test validity** to test whether the RADIUS server is configured properly.

Step 4 Click **OK**. You can then view RADIUS authentication configurations in the RADIUS server list.

----End

Follow-up Operations

To modify or disable RADIUS authentication, click **Edit** in the **Operation** column and reconfigure RADIUS authentication in the displayed dialog box.

5.5.4 Configuring Remote Azure AD Authentication

You can interconnect your bastion host with the Azure AD platform to authenticate logins to your bastion host.

This topic describes how to configure the Azure AD authentication.

Prerequisites

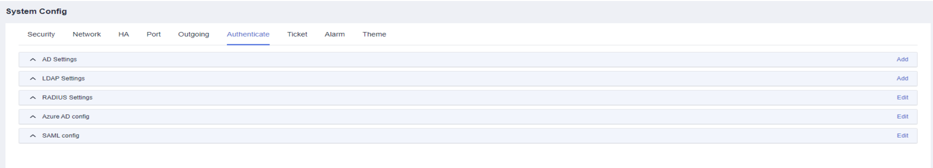
- You have the management permissions for the **System** module.
- You have created users and added enterprise application resources on Azure AD, and obtained information about the Azure AD platform configuration.

Procedure

Step 1 Log in to your bastion host.

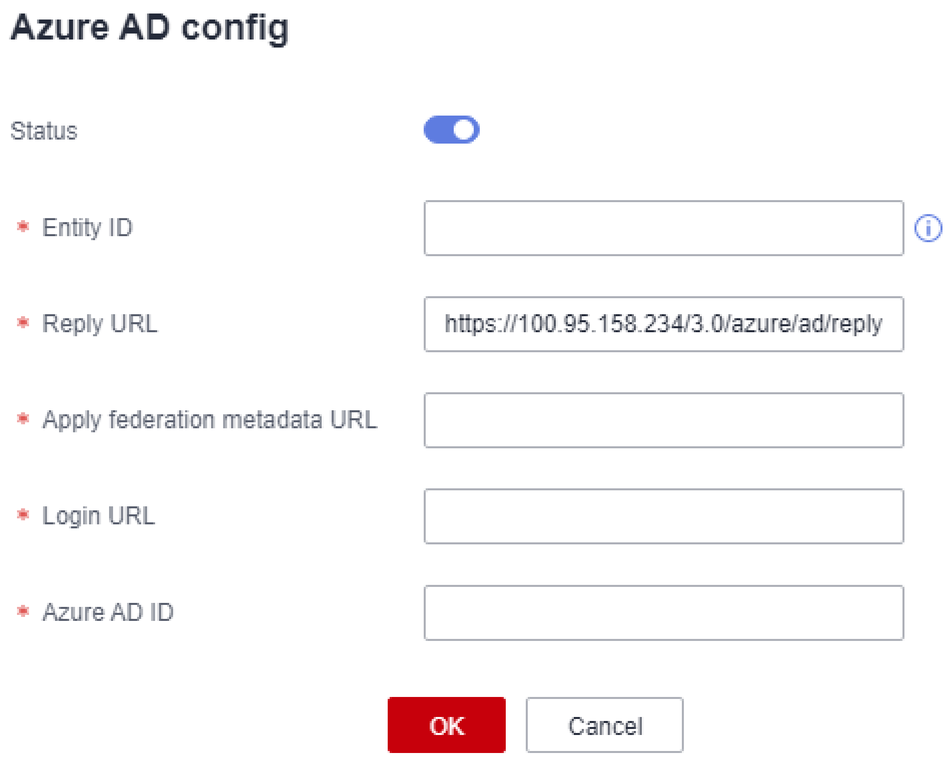
Step 2 Choose **System** > **Sysconfig** > **Authenticate**.

Figure 5-16 Configuring remote authentication



Step 3 Click **Edit** in the **Azure AD config** area.

Figure 5-17 Azure AD Config



Azure AD config

Status

* Entity ID

* Reply URL: https://100.95.158.234/3.0/azure/ad/reply

* Apply federation metadata URL

* Login URL

* Azure AD ID

Table 5-12 Azure AD authentication parameters

Parameter	Description
Status	Specifies the status of remote Azure AD authentication (default: ○). - ●: Azure AD authentication is enabled. Remote Azure AD authentication is enabled when a user starts a login. - ○: Azure AD authentication is disabled.
Entity ID	Specifies the enterprise name or URL.
Reply URL	Specifies the reply URL. This parameter is automatically set to the URL of the current bastion host. If the IP address or domain name of the bastion host is changed, change the IP address or domain name in the URL.
Apply federation metadata URL	Specifies the application federation metadata URL generated after SAML signature certificate is configured in Microsoft Azure.
Logon URL	Specifies the login URL generated after SAML single sign-on is configured in Microsoft Azure.

Parameter	Description
Azure AD ID	Specifies the Azure AD ID generated after SAML single sign-on is configured in Microsoft Azure.

Step 4 Click **OK**. You can then view Azure AD authentication configurations in the Azure AD server list.

NOTICE

If the Azure AD certificate is updated, you need to delete the old certificate on the Azure AD portal before logins.

----End

Follow-up Operations

- To modify or disable Azure AD authentication, click **Edit** in the **Operation** column and reconfigure Azure AD authentication in the displayed dialog box.
- After Azure AD authentication is configured, you are required to create a user who has been added to the enterprise application or created on the Azure platform. For details, see **Creating a User**.

5.5.5 Configuring Remote SAML Authentication

You can interconnect your bastion host with the SAML platform to authenticate logins to your bastion host.

This topic describes how to configure the SAML authentication mode.

Prerequisites

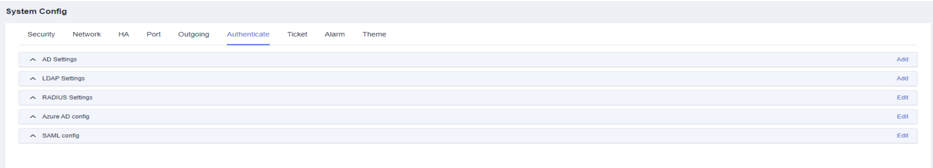
- You have obtained the permission to manage the **System** module in the bastion host.
- You have created a user on the SAML platform and obtained related configurations on the SAML platform.

Procedure

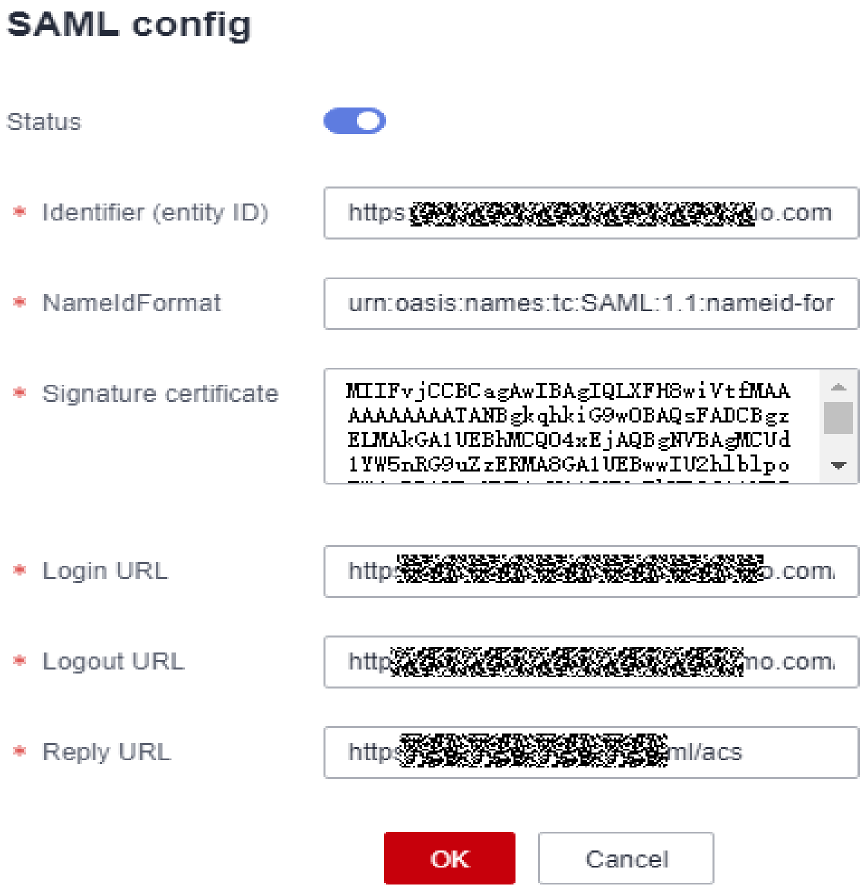
Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Authenticate**.

Figure 5-18 Configuring remote authentication



Step 3 Click **Edit** in the **SAML Settings** area.



SAML config

Status ●

* Identifier (entity ID): https[redacted]o.com

* NameIdFormat: urn:oasis:names:tc:SAML:1.1:nameid-for

* Signature certificate:

```
MIIFvjCCBCagAwIBAgIQLXFH8wiVtfMAA
AAAAAAAATANBgkqhkiG9w0BAQsFADCBgz
ELMAkGA1UEBhMCQ04xEjAQBgNVBAgMCUd
1YW5nRG9uZzERMA8GA1UEBwwIU2hlblpo
```

* Login URL: http[redacted].com.

* Logout URL: http[redacted]no.com.

* Reply URL: http[redacted]ml/acs

Figure 5-19 Configuring SAML authentication

Table 5-13 SAML authentication parameters

Parameter	Description
Status	Specifies the status of remote SAML authentication (default: ○). - ●: SAML-based authentication is enabled. Remote SAML authentication is enabled when the user starts a login. - ○: SAML-based authentication is disabled.
Cover Existing Users	Whether to enable the SAML overwriting function. The default value is ○. - ●: If an account with the same username already exists, the existing account will be overwritten. - ○: If an account with the same name already exists, the SAML user fails to be created in the system.

Parameter	Description
Entity ID	Obtain the metadata from IdP (Shibboleth IDP, which is configured in the **C:\Program Files (x86)\Shibboleth\IdP\metadata** directory by default). Identifier: Enter the following part of **EntityID**.
NameIdFormat	Obtain the metadata from IdP (Shibboleth IDP, which is configured in the **C:\Program Files (x86)\Shibboleth\IdP\metadata** directory by default). NameIdFormat: The value **urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified** is recommended.
Signature certificate	Enter the signing certificate of **FrontChannel** displayed in the IdP.
Logon URL	Enter the location address of **SingleSignOnService** displayed in the **HTTP-Redirect**.
Logout URL	Enter the location address of **SingleSLogoutService** displayed in the **HTTP-Redirect**.
Reply URL	The default value of **Host** is the IP address of **Localhost**. Set this parameter based on the site requirements, for example, the domain name.

Step 4 Click **OK** to submit the configuration data. You can view and manage SAML authentication configurations.

----End

5.6 USB Key Management

USB keys can only be issued to user accounts with USB key authentication enabled in multifactor verification.

Before using a USB key for second authentication, prepare USB keys and install the USB key driver on the local computer. A USB key from a vendor cannot be identified by other vendors for login authentication. So, the vendor must be specified for each USB key. For details, see **Configuring USB Keys**.

Prerequisites

- You have obtained a USB key.
- You have the management permissions for the **User** module.
- You have the management permissions for the **USBKey** module.

Procedure

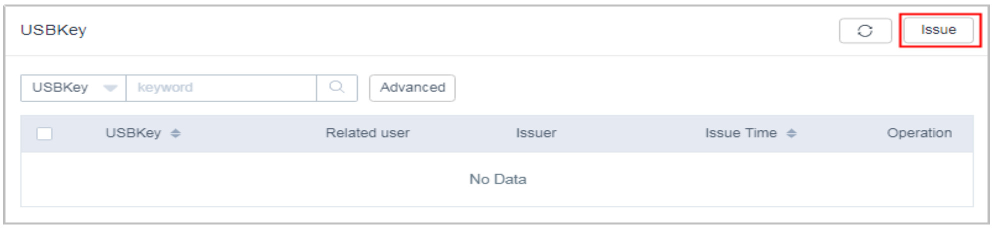
One USB key can be issued to one user only.

Step 1 Log in to your bastion host.

Step 2 Choose **User** > **USBKey** in the navigation pane.

Step 3 Click **Issue** to issue a USB key.

Figure 5-20 USBKey



Step 4 Select a user with the USB key multifactor verification enabled as the related user.

Figure 5-21 Issuing a USB key

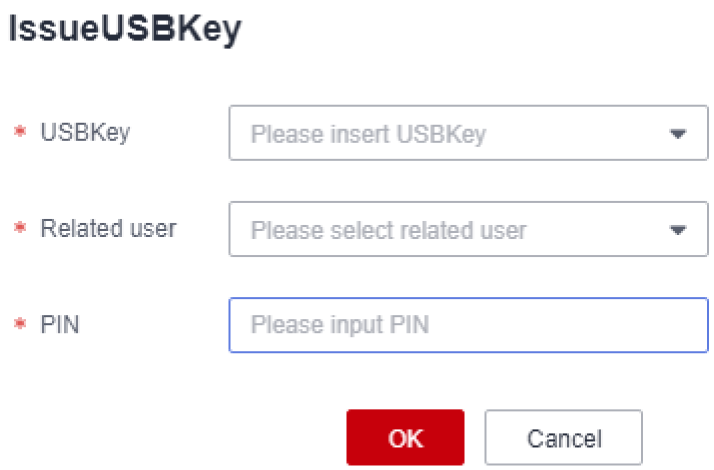


Table 5-14 Parameters for issuing a USB key

Parameter	Description
USBKey	Specifies the USB key ID.
Relate User	Specifies the user to which the USB key is related. USB key in multifactor verification must be enabled for such users.
PIN	Specifies the personal identification number (PIN) uniquely corresponding to the USB key. It is provided by the USB key vendor.

Step 5 Click **OK**. You can then view the newly issued USB key in the USB key list.

When you log in to a bastion host as a related user, insert the issued USB key to the local host. The bastion host automatically identifies the USB key. So you can select the corresponding USB key on the login page and enter the PIN number to finish the authentication.

----End

Revoking a USB Key

Step 1 Log in to your bastion host.

Step 2 Choose **User** > **USBKey** in the navigation pane.

Step 3 In the **Operation** column of the row containing the USB key to be revoked, click **Revoke**.

Step 4 To revoke multiple USB keys at a time, select the ones you want and click **Revoke** at the bottom of the USB key list to revoke the selected USB keys together.

----End

5.7 OTP Token Management

OTP tokens can be issued only to users with **OTP Token** enabled in multifactor verification.

You need to prepare OTP tokens in advance. You can use Jansh ETZ201/203 OTP tokens for logins.

Prerequisites

- You have obtained a hardware token.
- You have the management permissions for the **User** module.
- You have the management permissions for the **OTP** module.

Issuing an OTP Token

One OTP token can be issued only to one user.

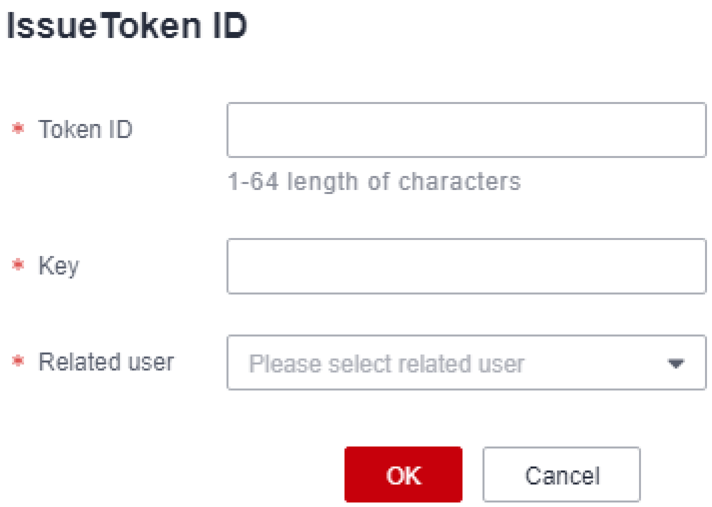
Step 1 Log in to your bastion host.

Step 2 Choose **User** > **OTP token** in the navigation pane.

Step 3 Click **Issue** to issue an OTP token.

Step 4 Enter the required token information.

Figure 5-22 Issue Token ID



IssueToken ID

* Token ID
1-64 length of characters

* Key

* Related user
Please select related user

Table 5-15 Parameters for issuing an OTP token

Parameter	Description
Token ID	Specifies the OTP token ID.
Key	Specifies the key uniquely corresponding to the OTP token. It is provided by the OTP token vendor.
Relate User	Specifies the user to whom the OTP token is related. OTP token must be enabled in multifactor verification for such users.

Step 5 Click **OK**. You can view the newly issued OTP token in the OTP token list.

For users with OTP token enabled, they need to enter the username, password, and the dynamic password issued by the OTP token for logins.

----End

Importing an OTP Token

Step 1 Log in to your bastion host.

Step 2 Choose **User** > **OTP token** in the navigation pane.

Step 3 Click **Import** to batch import OTP tokens.

Step 4 Click **Download** next to **Download template**.

Step 5 Enter the configuration information of the OTP tokens to be imported according to the configuration requirements of the template.

Step 6 Click **Upload** and select the complete template.

- You can upload files in CSV, XLS, or XLSX format.
- **Override existing OTP token**
  - Selected: The token ID will be overwritten if two tokens have the same key and related user configured, and the information of the existing token will be updated but the token is not deleted.
  - Not selected: The system skips the tokens with duplicate keys and related users.

Step 7 Click **OK**. You can then view the imported OTP tokens in the token list.

----End

Exporting an OTP Token

Step 1 Log in to your bastion host.

Step 2 Choose **User** > **OTP token** in the navigation pane.

Step 3 Select the OTP token to be exported.

If no tokens are selected, all tokens are exported by default.

Step 4 Click **Export** in the upper right corner next to the **Advanced** search box.

----End

Revoking an OTP Token

After an OTP token is deleted, the related user cannot log in to the bastion host through the OTP token.

Step 1 Log in to your bastion host.

Step 2 Choose **User** > **OTP token** in the navigation pane.

Step 3 In the **Operation** column of the row containing the OTP token to be revoked, click **Revoke**.

Step 4 In the OTP token list, you can select multiple OTP tokens and click **Revoke** at the bottom of the list to revoke the selected tokens together.

----End

6 Resource

6.1 Overview

A bastion host enables centralized resource management, making it easier for you to manage entire lifecycle of managed resources and their accounts in a more secure way. You can easily switch over between resource management and maintenance through single sign-on (SSO) without affecting business running on resources.

- Resource types

  You can use a bastion host to manage a wide range of resource types, including Windows and Linux servers, Windows applications, databases, such as MySQL and Oracle, and Kubernetes servers. A host may map to multiple host resources. This means if you configure different protocols for the same host, the host resources are counted based on the protocols you configure for this host. This is similar to application resources. The following lists supported resource types:

  - Host resources of the client-server architecture, including hosts configured with the Secure Shell (SSH), Remote Desktop Protocol (RDP), Virtual Network Computing (VNC), Telnet, File Transfer Protocol (FTP), SSH File Transfer Protocol (SFTP), Secure Copy Protocol (SCP), or Rlogin protocol.
  - Application resources of the browser-server architecture or the client-server architecture, including more than 12 types of browser- and client-side Windows applications, such as Microsoft Edge, Google Chrome, and Oracle tools.

- Resource management

  - Batch importing

    A bastion host supports auto-discovery, synchronization, and bulk importing of cloud resources, such as Elastic Cloud Server (ECS) and Relational Database Server (RDS) instances for centralized operation.

  - Account group management

    A bastion host manages resource accounts by group, enabling you to grant permissions to multiple resource accounts quickly by adding resource accounts of the same attribute to an account group and granting permissions to the account group.

– Batch management

  You can manage information and accounts of managed resources in batches, including modifying and deleting resource information, adding resource labels, verifying managed resource accounts, and deleting managed resource accounts.

6.2 Managing Host Resources Using a Bastion Host

A bastion host can manage hosts through a wide range of protocols, such as SSH, RDP, VNC, Telnet, FTP, SFTP, SCP, and Rlogin, covering Windows hosts, Linux hosts, and databases.

This topic describes how to use a bastion host to centrally manage your host resources. We will introduce how to add a host resource, import host resources from a file, import host resources from a cloud platform, automatically discover host resources, and clone host resources.

Constraints

- The total number of host and application resources to be added cannot exceed the **number of assets**.
- The values of **Protocol** and **Host Address** must be unique in a bastion host. This means the host resources to be managed must be unique. Otherwise, when you create a host resource with the same configuration, an error message will be displayed, indicating that the host resource already exists.
- To set **Department** to a superior department for a host resource, you must have management permissions for the **Department** module. For details about how to edit the role permissions of a user, see **Editing Role Information**.

Prerequisites

You have the operation permissions for the **Host** module.

Adding a Host Resource

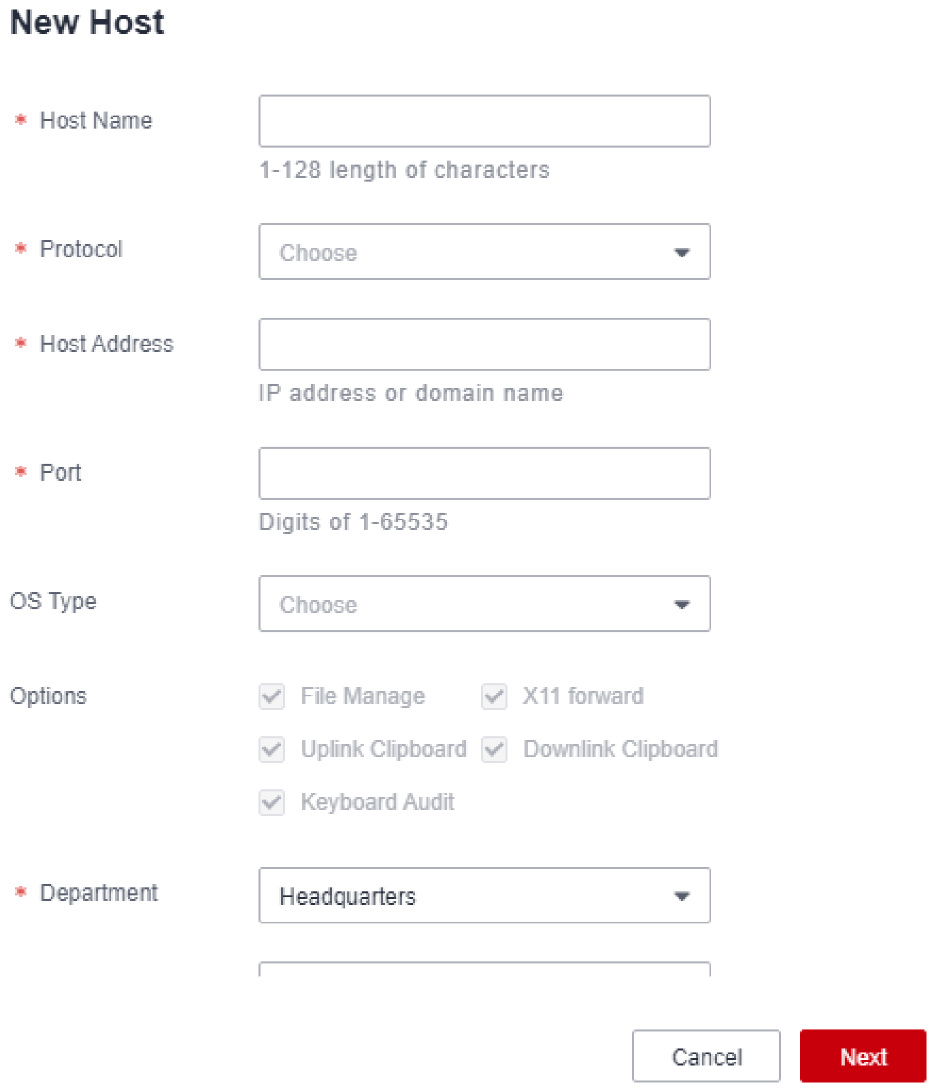
Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Host** in the navigation pane on the left.

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

Enter the required network information and basic information of the host resource you want to add.

Figure 6-1 New Host



New Host

* Host Name

1-128 length of characters

* Protocol: Choose

* Host Address

IP address or domain name

* Port

Digits of 1-65535

OS Type: Choose

Options: ☑ File Manage ☑ X11 forward ☑ Uplink Clipboard ☑ Downlink Clipboard ☑ Keyboard Audit

* Department: Headquarters

Table 6-1 Host resource network parameters

Parameter	Description
Host Name	Custom name of the host resource. A host name must be unique in a bastion host.
Protocol	Type of the protocol configured for the host. . Supported protocols: SSH, RDP, VNC, Telnet, FTP, SFTP, SCP, and Rlogin

Parameter	Description
Host Address	Host IP address that can be used to establish connection with your bastion host. ● Select the EIP or private IP address of the host. Private IP addresses are recommended. ● By default, the IPv4 address of the host is used. After an IPv6 address is enabled for a host, select either the IPv4 address or IPv6 address. **NOTE** A private IP address on the same VPC network recommended. The network stability and proximity will affect the O&M activities through a bastion host. The external access port of the private IP address is not restricted by the network security (security group and ACL) policies. While the port for external access over an EIP is restricted by network security policies. So a managed host resource may become inaccessible over an EIP through the basion host. So we recommend private IP addresses.
Port	Port number of the host.
OS Type	(Optional) Type of the host OS or device OS. ● The default value is empty. You need to select an OS type based on the type of the added resources. ● 14 OS types are supported, including Linux, Windows, Cisco, Huawei, H3C, DPtech, Ruijie, Sugon, Digital China sm-s-g 10-600, Digital China sm-d-d 10-600, ZTE, ZTE5950-52tm, Surfilter, and ChangAn. ● In addition, system administrator **admin** can customize OS types. ● For details, see **OS Types**.
Terminal Speed	If you select **Rlogin** for **Protocol**, you can select different terminal speed.
Encode	If you select **SSH** or **TELNET** for Protocol, the Chinese character can be used on the O&M page. The options are **UTF-8**, **Big5**, and **GB18030**.
Terminal Type	If you select **SSH** or **TELNET** for Protocol, you can specify the O&M terminal you want. The options are **Linux** and **Xterm**.

Parameter	Description
Options	(Optional) Select **File Manage**, **X11 forward**, **Uplink Clipboard**, **Keyboard Audit**, and/or **Downlink Clipboard**. ● **File Manage**: This option is supported only by SSH, RDP, and VNC hosts. ● **Clipboard**: This option is supported only by SSH, RDP, and Telnet hosts. ● **X11 forward**: This option is supported only by SSH hosts. ● **Keyboard Audit**: Only RDP, VNC, and protocol hosts can be configured.
Department Name	Department to which the host resource belongs.
Label	(Optional) You can customize a label or select an existing one.
Remarks	(Optional) Provides the description of the host resource.

Step 4 Click **Next** and start to add resource accounts.

Table 6-2 Parameters of managed host accounts

Parameter	Description
Add Account	When to add the account. The options are **Rightnow** and **Afterward**. ● If you select **Rightnow**, continue the configuration on the page to add the account immediately. ● If you select **Afterward**, no further configuration is required on the page. You can add the account information later in the resource list or on the resource details page.
Login Type	Login method. You can select **Auto Login**, **Manual Login**, **Sudo Login**, or **CSMS Credentials Login**. ● If you select **Auto Login**, **Account** and **Password** are mandatory. ● If you select **Manual Login**, **Account** and **Password** are optional. ● If you select **CSMS Credentials Login**, make sure you have available credentials. ● If you select **Sudo Login**, a password is mandatory. **NOTE** If you select the key pair automatic login mode, select **Allow to change the SSH Key** when creating a password change policy, or manual password change may fail.

Parameter	Description
Account	Account username of the managed host. **NOTE** If the AD domain service is installed on the host, the added account is *Domain name|Host account name*, for example, ad\administrator.
Password	Password of the account being added. By default, **Verify** is selected. After the account is added, the system automatically verifies the status of the account. **NOTE** ● Verification succeeded. After the account is verified, the host resource information is saved. ● Verification failed – If the system prompts that the verification times out, return to the configuration window and modify the resource information. – If the system prompts that the account password is incorrect, return to the configuration window and change the account password.
SSH Key	Authentication method that can be configured for host resources using the SSH protocol. After the configuration, an SSH key is preferentially used to log in to a related host resource.
Passphrase	Private key sequence corresponding to the SSH key. This parameter is optional. ● You do not need to enter the password for logging in to the host when no private key password is generated. ● You need to enter the private key password each time you log in to the host when the private key password is generated.
Description	Brief description of the account.

NOTE

If no accounts are configured for the managed hosts, account **[Empty]** is generated by default. When you log in to the managed host through a bastion host for operations, select **[Empty]** and enter the username and password of an account of the host.

Step 5 Click **OK**. After the account is verified, you can then view the new host resource under the **Host** tab.

----End

Importing Host Resources from a File

To import application server from a file, the file must be in .csv, .xls, or .xlsx format.

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Host** in the navigation pane on the left.

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

Step 4 Select **From file** for **Import**.

Step 5 Click **Download** next to **Download template**.

Step 6 Enter the information of host resources according to the configuration requirements in the template file.

Table 6-3 Template parameters

Parameter	Description
Name	(Mandatory) a user-defined host resource name.
IP address/ domain name	(Mandatory) IP address or domain name of a host.
Protocol	(Mandatory) Select the protocol type of the host resource. Only one protocol type can be selected for a certain type of host resource. . Supported protocols: SSH, RDP, VNC, Telnet, FTP, SFTP, SCP, and Rlogin
Port	(Mandatory) Enter the host port number.
OS Type	Enter the operating system type of the host.
Department Name	(Mandatory) the department to which the host resource belongs. The department structure must be complete. ● Only one department structure can be entered, and a resource can belong to only one department. ● By default, the department can be set to **HQ**. Use a comma (,) to separate a department and its lower-level department. ● Only the **department** that has been created in the system can be entered.
Label	Label of the host resource. ● You can enter multiple labels and separate them with commas (,).
Remarks	Provides supplementary information about the host resource.
Account	Account of the host resource. ● If this parameter is left blank, no **Empty** account will be generated.
Logon Type	Method to log in to the host resource. ● This parameter can be set to **Auto Login**, **Manual Login**, or **Sudo Login**.

Parameter	Description
IS Sudo	Whether to set the account as a sudo account. - This parameter can be set to **Yes** or **No**.
Password	Password of the account for logging in to the resource.
SSH Key	Authentication method that can be configured for SSH hosts. After the configuration, an SSH key is preferentially used to log in to a related host resource.
passphrase	Private key sequence mapped to the SSH key. You need to enter the private key password each time you log in to the host when the private key password is generated. For details, see **How Do I Configure an SSH Key for Logging In to a Managed Host?**
Oracle Param	This parameter is mandatory for Oracle hosts. - This parameter can be set to **SERVICE_NAME** or **SID**. - Separate multiple parameter values with commas (,).
SERVICE_NAME or SID	This parameter is mandatory for Oracle hosts. - Separate multiple parameter values with commas (,).
Login Role	This parameter is mandatory for Oracle hosts. - This parameter can be set to **normal**, **sysdba**, or **sysoper**. - Separate multiple parameter values with commas (,).
Database Name	This parameter is mandatory for the DB2 databases. - Select the database name or instance name. - Separate multiple parameter values with commas (,).
Instance Name	This parameter is mandatory for the DB2 databases. - Select the database name or instance name. - Separate multiple parameter values with commas (,).
Switch From	For a host resource using the SSH protocol, enter its account username and set it to a sudo account.
Switch command	The command to switch over between accounts.
Description	Brief description of the managed resource account.

Parameter	Description
Account Group	The account group to which the managed resource account belongs. ● A managed resource account can belong to multiple account groups in the same department. Use a comma (,) to separate every two account groups. ● Only the **account group** that has been created in the system can be entered.

Step 7 Click **Upload** and select the completed template.

Step 8 (Optional) Configure **Override existing hosts**, which is not selected by default.

- Selected: An existing host resource will be overwritten when the existing host resource and the one being imported have the same *protocol type@host address:port* information.
- Deselected: An existing host resource will be skipped when the existing host resource and the one being imported have the same *protocol type@host address:port* information.

Step 9 Click **OK**.

NOTE

- When you import host information by file, provide the host information based on configuration requirements in the .xlsx template file.
- SSH private keys can be used for logging in to hosts over SSH. When you set **SSH Key** and **Passphrase** parameters, enter the correct private key and password. After the SSH key public key and passphrase password are configured, the SSH key private key is preferentially used to verify login.
- The SSH key private key and passphrase are optional. You are advised to manage only the host accounts and passwords for managed hosts whose information is imported in batches.

----End

Importing Hosts from a Cloud Platform

You can discover resources in the current region and add them all to your bastion host in just a few clicks.

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Host** in the navigation pane on the left.

Step 3 Click **Import Cloud Resources** in the upper right corner of the page.

Table 6-4 Parameter description

Parameter	Description
Resource Type	You can select the cloud host or cloud database type. **NOTE** Currently, only MySQL, PostgreSQL, and SQL Server databases are supported.
Authentication Type	You can select AK/SK or a cloud service agency. **NOTE** Currently, Platform Bastion Host (PBH) supports only the AK/SK authentication.
Access Key ID	This parameter is mandatory when **Authentication Type** is set to **AK/SK**. To get the access key ID, click the information icon on the right of the text box.
Access Key Secret	This parameter is mandatory when **Authentication Type** is set to **AK/SK**. To get access key secret, click the information icon on the right of the text box of **Access Key ID**.
Priority of IP imported	You can select **Public** or **Internal**.
Options	(Optional) Configure **Override existing hosts**, which is not selected by default. ● Selected: An existing host resource will be overwritten when the existing host resource and the one being imported have the same *protocol type@host address:port* information. ● Deselected: An existing host resource will be skipped when the existing host resource and the one being imported have the same *protocol type@host address:port* information.
Department Name	Department to which the imported host resources belong.
Label	Label attached to the imported host resources.

Step 4 Check the information and click **Next**. On the region selection page, select the region where resources are to be imported.

NOTE

You can select only one region at a time.

Step 5 Confirm the information and click **Next**. The system automatically completes the import. After the import is finished, check the host list.

----End

Auto Discovery of Host Resources

With the **Auto Discover** function, you can use Nmap to scan for hosts in a specific IP address or IP address range.

NOTE

Host resources can be automatically discovered only when the hosts and your bastion host are in the same VPC and the network connection is normal.

Step 1 Log in to your bastion host.

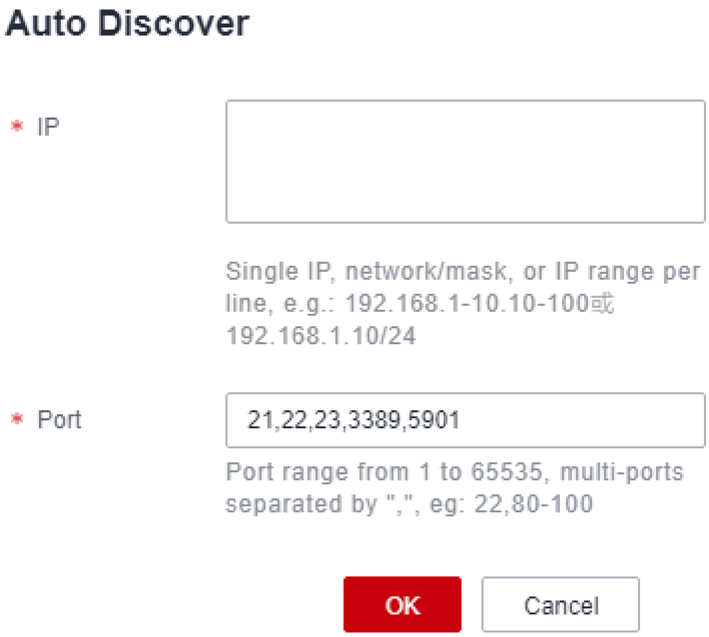
Step 2 Choose **Resource** > **Host** in the navigation pane on the left.

Step 3 Click **Auto Discover** in the upper right corner of the page.

Step 4 Enter the IP address and port number of host resources to be imported.

The default ports are **21**, **22**, **23**, **3389**, and **5901**. You can also add other ports or port ranges.

Figure 6-2 Auto Discover



Auto Discover

* IP

Single IP, network/mask, or IP range per line, e.g.: 192.168.1-10.10-100或192.168.1.10/24

* Port: 21,22,23,3389,5901

Port range from 1 to 65535, multi-ports separated by ",", eg: 22,80-100

Step 5 Click **OK** to start the auto discovery.

Step 6 Select the host resources to be imported.

- Enter a host name. If you do not enter the host name, the default host name is the IP address of the host.
- A protocol type is set automatically for the host based on default port. If the host does not match the default port, manually select a protocol type.

Step 7 Select the discovered hosts and click **Add**.

Click **Return** or **Close** to return to the host resource list page and view the newly added host resources.

----End

Cloning Host Resources

If you want to add a host as many types of resources to your bastion host, you can add other types of host resources by just modifying configurations of a certain type you have added to CBH.

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Host** in the navigation pane on the left.

Step 3 In the **Operation** column of an added host resource, choose **More** > **Clone**.

Step 4 Modify information of the host resource and add accounts for the new host resource.

To complete the host clone, modify at least one of the following parameters of the host resource you select: **Protocol**, **Host Address**, and **Port**.

Step 5 Click **OK**.

----End

Batch Exporting Host Resources

Click ↗ in the upper right corner of the list to export all data in the list.

6.3 Managing Application Servers Using a Bastion Host

You can use a bastion host to manage application resources and application accounts on Windows or Linux servers that support remote desktops. To do so, you only need to install clients and browsers on those servers.

After you obtain the permission for application resources, you can access client-based application resources and browser-based application resources via your bastion host. You do not have to manually enter usernames and passwords as the credentials are automatically filled in. A bastion host also records all operations by video. In this way, remote application accounts security is under control, and remote application operations can be auditable.

You can use a bastion host to manage a wide range of application resources, such as Google Chrome, Microsoft Edge, Mozilla Firefox, SecBrowser, Oracle Tool, MySQL, SQL Server Tool, dbisql, VNC Client, vSphere Client and Radmin.

This topic describes how to use a bastion host to centrally manage application resources. This topic covers how to add an application server, import an application server from a file, add an application resource, and import application resources from a file to a bastion host.

Constraints

- The total number of host and application resources to be added cannot exceed the **number of assets**.
- For Windows servers, only applications running on Windows Server 2008 R2 or later can be managed.

- For Linux servers, only applications running on Linux CentOS 7.9 servers can be managed.
- Only the Mozilla Firefox browser applications and Dameng data management tool V8 can be invoked for Linux servers.
- Port 2376 and ports 35000 to 40000 must be enabled between a Linux server and the bastion host. The port cannot be changed once it is enabled.
- Contact Huawei Cloud technical support to obtain the password for logging in to a Linux server.
- Before you add an application resource, ensure that an application server has been added.
- Automatic login accounts cannot be configured for Microsoft Edge application resources.

Prerequisites

- You have all resources ready, such as Windows servers, Linux servers, images, enterprise authorization codes, and client licenses, for deploying an application publishing server.
- You have installed the application server. For more details, see **Installing Application Publish Server**.
- You have obtained the permission to manage the **AppServer** and **Application** tabs under the **Application Publish** module.

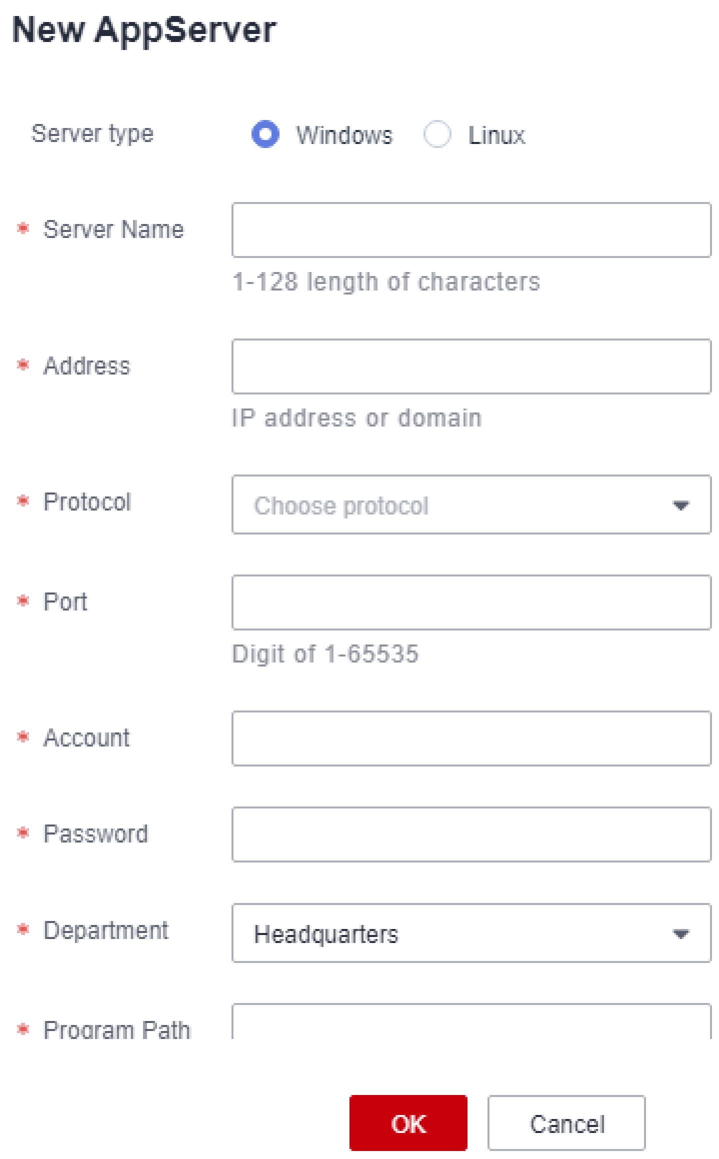
Adding an Application Server

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Application** > **AppServer**.

Step 3 Click **New**. In the displayed **New AppServer** dialog box, complete required parameters.

Figure 6-3 New AppServer



New AppServer

Server type ● Windows ○ Linux

* Server Name

1-128 length of characters

* Address

IP address or domain

* Protocol Choose protocol

* Port

Digit of 1-65535

* Account

* Password

* Department Headquarters

* Program Path

Table 6-5 New AppServer parameters

Parameter	Description
Server Type	- Windows - Linux
Server Name	Specifies the name of the application server. The server name must be unique in a bastion host.
Server	Specifies the IP address or domain name of the application server.

Parameter	Description
Type	Specifies the type of the browser or client tool used to access the application. ● If you set **Server type** to **Windows**: By default, 14 types are supported, including MySQL Tool, Microsoft Edge, Mozilla Firefox (for Windows servers), Oracle Tool, Google Chrome, VNC Client, SQL Server Tool, SecBrowser, vSphere Client, Radmin, dbisql, Navicat for MySQL, Navicat for PostgreSQL and Other. ● If you set **Server type** to **Linux**: Supported types: DM Tool, KingbaseES Tool, Mozilla Firefox for Linux, and GBaseDataStudio for GBase8a. By default, each application resource type corresponds to an application program. You can obtain the application name from the default **Program Path**.
Port	Enter the port number for accessing the application publish server. The default port 3389 is used for a Windows server and default port 2376 is used for a Linux server.
Account	This parameter is mandatory if **Server type** is set to **Windows**. Specifies the server account used to access the application. If AD domain is configured, the server account is in the format of *AD domain name\account name*, for example, *ad|administrator*.
Password	● If you set **Server type** to **Windows**, enter the password of the server account used to access the application. ● If you set **Server type** to **Linux**, contact technical support to obtain the password.
Department Name	Specifies the department of the application server.
Program Path	This parameter is mandatory if **Server type** is set to **Windows**. Specifies the path of the application resource on the application server. ● Each program type has a default startup path. You can also customize a startup path. For example, to allow a system user to access only Google Chrome from the application server, set **Program Path** to **C:\DevOpsTools\Chrome\chrome.exe**. ● If you select **Other**, manually configure the corresponding program path.
Remarks	(Optional) Provides the description of the application server.

Step 4 Click **OK**.

----End

Importing Application Servers from a File

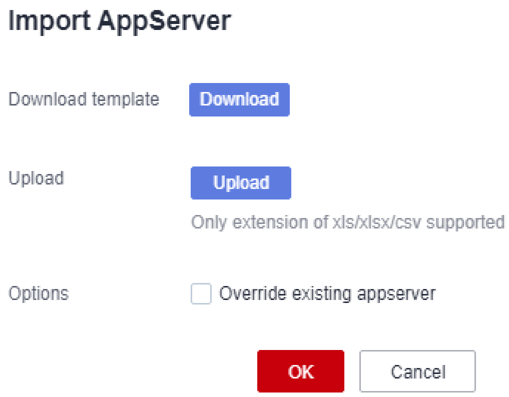
To import application server from a file, the file must be in .csv, .xls, or .xlsx format.

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Application** > **AppServer**.

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

Figure 6-4 Import App Server



Import AppServer

Download template: Download

Upload: Upload

Only extension of xls/xlsx/csv supported

Options: □ Override existing appserver

Step 4 Click **Download** to download the template if no template is available locally.

Step 5 Enter the configuration information of application servers to be imported according to the configuration requirements in the template file.

Step 6 Click **Upload** and select the completed template.

Step 7 (Optional) Configure **Override existing appservers**. This option is deselected by default.

- If you select this option, an existing application server information will be overwritten by the one being imported when both application servers have the same name.
- If you deselect this option, an existing application server information will be skipped when the one being imported and the existing one have the same name.

Step 8 Click **OK**.

----End

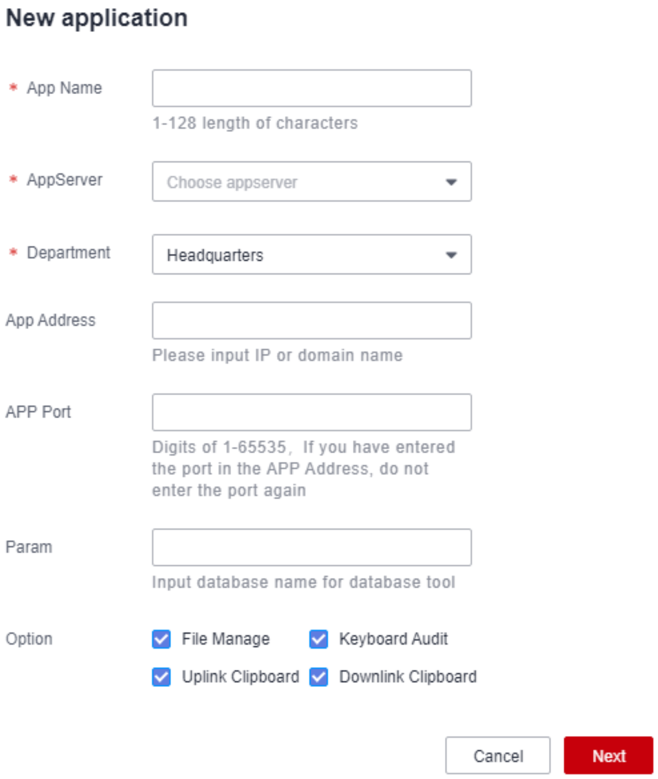
Adding an Application Resource

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Application** > **Application**.

Step 3 Click **New**. In the displayed **New application** dialog box, complete required parameters.

Figure 6-5 New application



New application

* App Name
1-128 length of characters

* AppServer: Choose appserver

* Department: Headquarters

App Address
Please input IP or domain name

APP Port
Digits of 1-65535，If you have entered the port in the APP Address, do not enter the port again

Param
Input database name for database tool

Option: ☑ File Manage ☑ Keyboard Audit ☑ Uplink Clipboard ☑ Downlink Clipboard

Table 6-6 Parameters for adding a new application resource

Parameter	Description
App Name	Specifies the name of an application resource to be added. The **App Name** of an application resource must be unique in a bastion host. **NOTE** The application name must be unique in a bastion host. This means it cannot be the same as the name of any managed hosts or other application resources.
AppServer	Select a created application publishing server.
Department Name	Specifies the department of the application.
APP Address	(Optional) Specifies the address of the application. The value can be an IP address or domain name. ● If the application is released as a browser, enter the URL of the web page. If the address has a corresponding port, enter the address in the format of *URL:Port number*. ● If the application is released as a database or client, enter the address of the database server.

Parameter	Description
APP Port	(Optional) Enter the application access port. ● If the application is released as a database or client, enter the database access port. ● Leave this parameter blank if the application is released in other formats except databases.
Param	(Optional) Set application parameters. ● Enter the database instance name if the application is released as a database. ● Leave this parameter blank if the application is released in other formats except databases.
Options	(Optional) Select **File Manage**, **Uplink Clipboard**, **Keyboard Audit**, and/or **Downlink Clipboard**.
Label	(Optional) You can customize a label or select an existing one.
Remarks	(Optional) Provides the description of the application resource.

Step 4 Click **Next**.

Table 6-7 Parameters for adding accounts for an application resource

Parameter	Description
Add Account	● If you select **Rightnow**, configure **Logon Type** and then **Account**. ● If you select **Afterward**, no further configuration is required on the page. You can add the account information later in the resource list or on the resource details page. In this situation, when you click **OK**, account **[Empty]** is automatically created. Only one **[Empty]** account is created for an application resource.
Logon Type	● If you select **Auto Login**, **Account** and **Password** must be provided. ● If you select **Manual Login**, **Account** and **Password** are optional. If no application account is set, the **[Empty]** account is automatically created.
Account	Account to access the application
Password	Password of the application account
AD Domain	For Radmin application resources, enter the AD domain server address.

Parameter	Description
Description	Brief description of the account.

NOTE

When logging in to a managed host using **[Empty]**, manually enter the application account username and password.

Step 5 Click **OK**.

----End

Importing Application Resources from a File

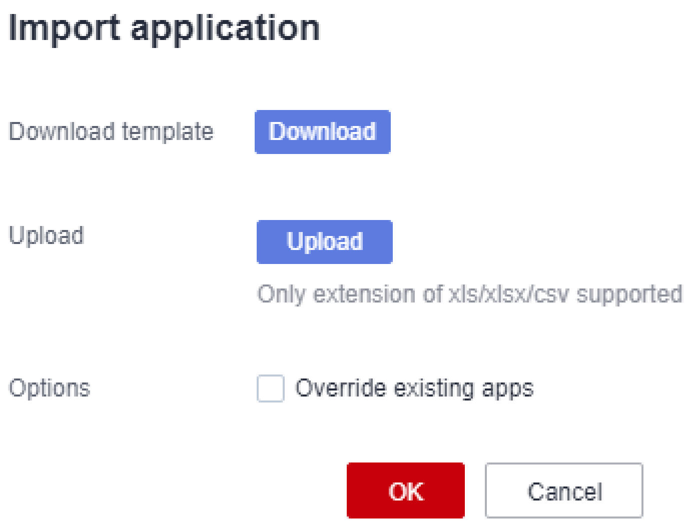
To import application server from a file, the file must be in .csv, .xls, or .xlsx format.

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Application** > **Application**.

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

Figure 6-6 Import application



Import application

Download template: Download

Upload: Upload

Only extension of xls/xlsx/csv supported

Options: □ Override existing apps

OK Cancel

Step 4 Click **Download** next to **Download template**.

Step 5 Enter the configuration information of application resources to be imported according to the configuration requirements in the template file.

Step 6 Click **Upload** and select the completed template.

Step 7 (Optional) Configure **Override existing apps**. This option is deselected by default.

- Selected: A managed application resource will be overwritten by the one being imported if both application resources have the same name.
- Deselected: A managed application resource will be skipped when the managed one and the one being imported have the same name.

Step 8 Click **OK**.

----End

Batch Exporting Application Server List

Click ↗ in the upper right corner of the list to export all data in the list.

6.4 Adding Accounts of Managed Host or Application Resources into Your Bastion Host

A host or application resource may have multiple accounts configured. Each account of a managed host or application resource is considered as a managed resource account. You do not need to enter the username or password when you log in to a managed host using its managed resource accounts.

If no accounts are added for a host or application resource, the **Empty** account is generated by default. In this situation, when you log in to the host or application resource through your bastion host, a username and password is required.

This topic describes how to add a managed resource account after resources are managed in a bastion host.

Constraints

- Automatic login accounts cannot be configured for Microsoft Edge application resources.
- If the AD domain service is installed on the managed resources, the account to be added is *Domain name|Host account username*, for example, *ad|administrator*.

Prerequisites

- You have the operation permissions for the **Account** module.
- You have added host or application resources.

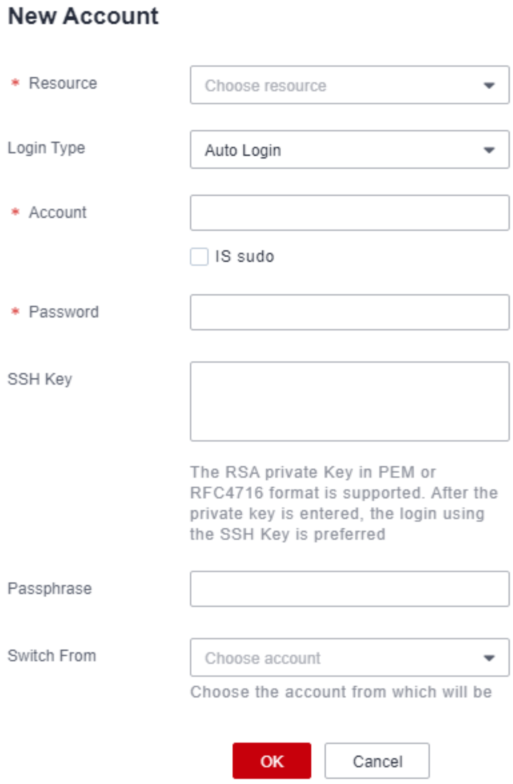
Adding an Account for a Resource

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Account** in the navigation pane.

Step 3 Click **New**. In the dialog box displayed, configure resource account attributes.

Figure 6-7 New Account



New Account

* Resource: Choose resource ▾

Login Type: Auto Login ▾

* Account:

□ IS sudo

* Password:

SSH Key:

The RSA private Key in PEM or RFC4716 format is supported. After the private key is entered, the login using the SSH Key is preferred

Passphrase:

Switch From: Choose account ▾

Choose the account from which will be

Table 6-8 Parameters for new managed resource accounts

Parameter	Description
Resource	Host or application resource to be related to the account.
Logon Type	Login method. You can select **Auto Login**, **Manual Login**, **Sudo Login**, or **CSMS Credentials Login**. ● If you select **Auto Login**, **Account** and **Password** are mandatory. ● If you select **Manual Login**, you can configure **Account**. ● If you select **CSMS Credentials Login**, you can configure **CSMS Credentials** and **Remarks**. ● If you select **Sudo Login**, a password is mandatory. ● **Sudo Login** is valid only for SSH hosts. If **Sudo Login** is selected, **Switch From** and **Switch Command** are mandatory.
Accounts	Account name of the managed resource. The value of **Account** must be unique in a bastion host and cannot be changed after it is created. If you select **IS sudo**, the account is identified as a sudo account for managing resources and has the password change permission.

Parameter	Description
Password	Password of the account being added By default, **Verify** is selected. After the account is added, the system automatically verifies the status of the account. ● After the account is verified, the resource information is saved. ● If the verification fails, modify the configuration as prompted. If the system prompts that the account verification times out, modify the resource configuration. If the system prompts that the account password is incorrect, return to the configuration window and change the account password.
SSH Key	Authentication method that can be configured for host resources using the SSH protocol. After the configuration, an SSH key is preferentially used to log in to a related host resource.
Passphrase	Private key corresponding to the SSH key configured for an SSH host.
CSMS Credentials	(This parameter is available only when login mode is CSMS credential login.) Select the CSMS credential to be managed.
Switch From	For an SSH host, select a configured account and set it to a sudo account.
Switch command	Switchover command for an SSH host, for example, **su root**.
Description	Brief description of the account.

Step 4 Click **OK**. The newly created account will be displayed in the account list.

----End

Batch Importing Accounts of Managed Resources into Your Bastion Host

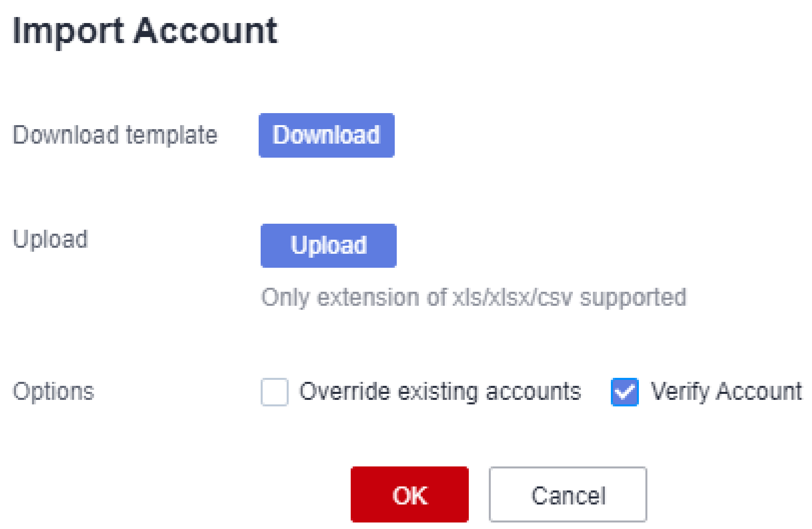
To import application server from a file, the file must be in .csv, .xls, or .xlsx format.

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Account** in the navigation pane.

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

Figure 6-8 Import Account



Import Account

Download template: Download

Upload: Upload
Only extension of xls/xlsx/csv supported

Options: □ Override existing accounts ☑ Verify Account

Step 4 Click **Download** to download the template if no template is available locally.

Step 5 Enter the information of accounts according to the configuration requirements in the template file.

Table 6-9 Template parameters

Parameter	Description
Account	(Mandatory) Enter the username of the managed resource account.
Logon Type	Method to log in to the resource. ● This parameter can be set to **Auto Login**, **Manual Login**, or **Sudo Login**.
IS Sudo	Whether to set the account as a sudo account. ● This parameter can be set to **Yes** or **No**.
Password	Password of the account for logging in to the resource.
SSH Key	Authentication method that can be configured for SSH hosts. After the configuration, an SSH key is preferentially used to log in to a related host resource.
Passphrase	Private key sequence mapped to the SSH key.
Oracle Param	This parameter is mandatory for Oracle hosts. ● This parameter can be set to **SERVICE_NAME** or **SID**. ● Separate multiple parameter values with commas (,).
SERVICE_NAME or SID	This parameter is mandatory for Oracle hosts. ● Separate multiple parameter values with commas (,).

Parameter	Description
Login Role	This parameter is mandatory for Oracle hosts. ● This parameter can be set to **normal**, **sysdba**, or **sysoper**. ● Separate multiple parameter values with commas (,).
Database Name	This parameter is mandatory for the DB2 databases. ● Select the database name or instance name. ● Separate multiple parameter values with commas (,).
Instance Name	This parameter is mandatory for the DB2 databases. ● Select the database name or instance name. ● Separate multiple parameter values with commas (,).
Switch From	Sudo account of the host resource.
Switch command	The command to switch over between accounts.
AD Domain	For Radmin application resources, enter the AD domain address.
Description	Brief description of the managed resource account.
Resource	Enter the name of the resource that has been added to the host list or application list.
IP address/ domain name	For associated host resources, enter the IP address or domain name of the host resource.
Type	(Mandatory) Enter the protocol type of the host resource or the application type of the application resource. ● Supported host protocols: SSH, RDP, VNC, Telnet, FTP, SFTP, DB2, MySQL, SQL Server, Oracle, SCP, PostgreSQL, GaussDB, and Rlogin. ● Supported application types: Microsoft Internet Explore, Mozilla Firefox for Windows, Google Chrome, VNC Client, SecBrowser, vSphere Client, Radmin, dbisql, Mysql Tool, SQLServer Tool, Oracle Tool, Rlogin, Mozilla Firefox for Linux, DM Tool, KingbaseES Tool, GBaseDataStudio for GBase8a, X11, and **Other**.
Port	This parameter is mandatory for host resources. Enter the IP address or domain name of the host resource.

Parameter	Description
Account Group	The account group to which the managed resource account belongs. ● A managed resource account can belong to multiple account groups in the same department. Use a comma (,) to separate every two account groups. ● Only the **account group** that has been created in the system can be entered.

Step 6 Click **Upload** and select the completed template.

Step 7 (Optional) Configure **Override existing accounts**, which is deselected by default.

- Selected: A managed resource account will be overwritten by the one being imported if both accounts have the same name.
- Deselected: A managed resource account will be skipped when the one being imported and the managed resource account have the same name.

Step 8 (Optional) Configure **Verify Account**, which is selected by default.

- Selected: The account status is verified when it is imported.
- Deselected, the account status will not be verified when it is imported.

Step 9 Click **OK**.

----End

Batch Creating Resource Accounts

You can create resource accounts for multiple hosts at the same time.

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Host** in the navigation pane on the left.

Step 3 Select the hosts for which you want to create accounts and choose **More** > **Add Account**.

NOTE

Only hosts with the same protocol type are supported.

Step 4 Enter the account information to be added, as shown in **Table 6-10**.

Table 6-10 Parameters for creating resource accounts in batches

Parameter	Description
Login Type	Select the login mode of the created accounts. ● **Auto Login** ● **Manual Login** ● **CSMS Credentials Login** ● **Sudo Login**

Parameter	Description
Account	Name of the account. You can specify one. If the login mode is set to automatic login, this parameter is mandatory.
Password	Password of the account.
SSH Key	This parameter is mandatory if the current account needs to log in to the system using an SSH key. The RSA private key in PEM or RFC4716 format is supported. After the RSA private key is entered, the SSH key is preferentially used for login.
passphrase	Password of the SSH key. You need to enter the SSH key first. If the SSH key is password-free, you do not need to set this parameter.
CSMS Credentials	This parameter is mandatory only when **Login Mode** is set to **CSMS Credentials Login**.
Description	Description of the current account. A maximum of 128 characters can be entered.
Options	Select an option. ● **Overwrite existing account**: You can select this to overwrite the existing accounts that have the same usernames as that of accounts your are creating. ● **Verify Account**: Check whether the added account can be used to log in to the system. This option can be selected only when the automatic login mode is used.

Step 5 Confirm the information and click **OK**.

----End

6.5 Resource Management

6.5.1 Verifying Managed Resource Accounts

The status of a managed resource account is used to identify whether the password of the account is correct. The password cannot be manually changed and can only be updated through account verification.

The managed resource accounts can be manually verified when they are added or automatically verified based on preset schedule.

NOTE

Account verification is to verify connectivity by logging in to resources in the background. This process will not be recorded in the history sessions.

Table 6-11 Resource account status description

Status	Description
Normal	If the account username and password are correct and the account can be used to log in to the system, the account is in the **Normal** status.
Abnormal	If the account username or password is incorrect, the account cannot be used to log in to the system. The account is in the **Abnormal** status.
N/A	If a resource account is not verified after it is added to a bastion host, the account is in the **N/A** status.

Constraints

Accounts for application resources cannot be verified online.

Prerequisites

You have the operation permissions for the **Account** module.

Automatic Inspection

The system automatically verifies managed host accounts at 01:00 on the fifth, fifteenth, and twenty-fifth days of each month. After the verification is complete, the **admin** system administrator will receive a verification result message. No task will be generated. The message is displayed on the **Messages** page.

Real-Time Verification

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Account** in the navigation pane.

Step 3 Select an account and click **Test and verify** at the bottom of the list. The verification configuration dialog box is displayed.

Step 4 Configure **Connect Timeout** and **Done notification**.

- The default **Connect Timeout** interval is **10** seconds. If the network condition is poor, increase the **Connection Timeout** interval.
- By default, no task completion notification is sent.
- To receive notifications, select **Email** or **SMS**. Additionally, you can view the verification results on the **Tasks** page.

Step 5 Click **OK**. Refresh the managed resource account list page and view the verification results in the **Status** column.

----End

Batch Account Verification

You can verify managed resource accounts by account group in just a few clicks.

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Account Group** in the navigation pane.

Step 3 Select an account group and click **Test and verify** at the bottom of the list. The verification configuration dialog box is displayed.

Step 4 Configure **Connect Timeout** and **Done notification**.

- The default **Connect Timeout** interval is **10** seconds. If the network condition is poor, increase the **Connection Timeout** interval.
- By default, no task completion notification is sent.
- To receive notifications, select **Email** or **SMS**. Additionally, you can view the verification results on the **Tasks** page.

Step 5 Click **OK**. Go to the managed resource account list page and view the verification results in the **Status** column.

----End

6.5.2 Deleting Managed Resources

This topic describes how to delete managed resources, such as host resources, application servers, application resources, and managed resource accounts, from a bastion host.

- Managed resource accounts will be deleted together with the related resources the instant the resources are deleted.
- Application resources will be deleted together with the related application servers the instant the application servers are deleted.

Prerequisites

You have the operation permissions for the **Host**, **AppServer**, **Application**, and **Account** modules.

Deleting One or More Managed Resource Accounts

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Account** in the navigation pane.

Step 3 Click **Delete** in the **Operation** column of the row where the account locates.

Step 4 Select multiple accounts and click **Delete** at the bottom of the account list to delete all selected accounts together.

----End

Deleting One or More Host Resources

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Host** in the navigation pane on the left.

Step 3 Locate the row where the host resource you want to delete resides and click **More** > **Delete** in the **Operation** column.

Step 4 Select multiple host resources and click **Delete** at the bottom of the list to delete all selected host resources.

----End

Deleting One or More Application Servers

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Application** > **AppServer**.

Step 3 Locate the row containing the application server you want to delete and click **Delete** in the **Operation** column to delete the application server.

Step 4 Select multiple application servers and click **Delete** at the bottom of the application server list to delete all selected application servers.

----End

Deleting One or More Application Resources

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Application** > **Application**.

Step 3 Locate the row where the application you want to delete resides and click **More** > **Delete** in the **Operation** column to delete the application resource.

Step 4 Select multiple application resources and click **Delete** at the bottom of the application list to delete all selected application resources together.

----End

6.5.3 Querying and Editing Managed Resource Configurations

This topic describes how to query and edit configurations of managed resources, including host resources, application servers, application resources, and managed resource accounts.

Prerequisites

You have the operation permissions for the **Host**, **AppServer**, **Application**, and **Account** modules.

Querying and Editing Host Configurations

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Host** in the navigation pane on the left.

Step 3 Query host resources.

- Quick search

Enter a keyword in the search box to quickly query host resources by host name, host IP address, and port number.

- Advanced search

  Enter keywords in the corresponding attribute search boxes to search for host resources in exact mode.

Step 4 Click the name of the host resource you want to edit or click **Manage** in the row of the host in the **Operation** column.

Step 5 View and edit basic information of the host resource.

In the **Basic Info** area, click **Edit**. In the displayed dialog box, edit the basic information.

- You can edit the **Host Name**, **Host Address**, **Port**, **OS Type**, **Department**, and **Remarks**.
- The **Protocol** cannot be modified.

Step 6 View and edit accounts of the host resource.

- To add an account for the host resource, click **Add** in the **Account** area and complete configurations in the displayed dialog box.
- To only remove an account, click **Remove** in the row of the account.

Step 7 View authorized users of the host resource.

Expand the **Authorized User** area to view information about system users who are authorized to manage the host.

----End

Batch Editing Host Resource Configurations

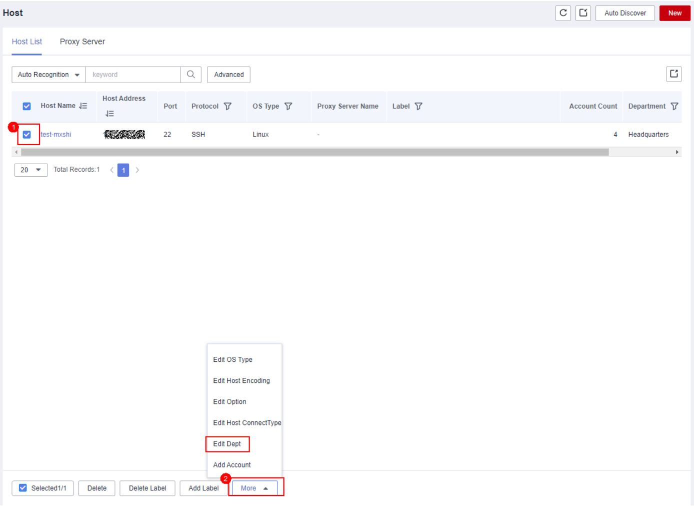
- Batch editing department of multiple hosts
- Batch editing options, including file management, uplink and downlink clipboard, keyboard audit, and X11 forwarding.
- Batch editing the host encoding formats
- Batch editing the host OS types

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Host** in the navigation pane on the left.

Step 3 In the host resource list, select the host resource you want to edit and click **More** in the lower left corner to expand the batch operation buttons.

Figure 6-9 Batch editing host resource configurations



☑	Host Name	Host Address	Port	Protocol	OS Type	Proxy Server Name	Label	Account Count	Department
1 ☑	test-mxshi	[redacted]	22	SSH	Linux	-		4	Headquarters

Step 4 Edit department of multiple selected hosts at a time.

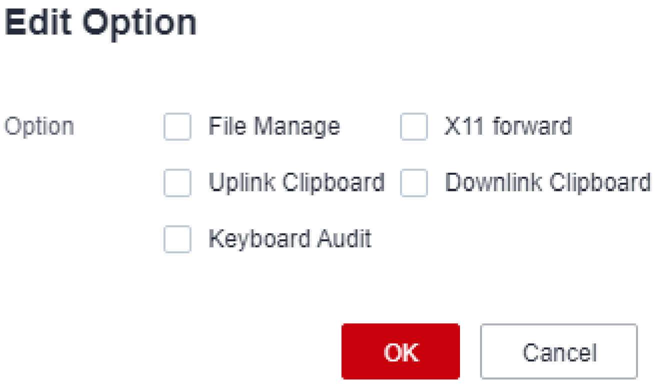
1. Click **Edit Dept**.
2. In the displayed dialog box, select a department.
3. Click **OK**.

Step 5 Edit options for multiple hosts.

- **File Manage**: This option is supported only by SSH, RDP, and VNC hosts.
- **Clipboard**: This option is supported only by SSH, RDP, and Telnet hosts.
- **X11 forward**: This option is supported only by SSH hosts.
- **Keyboard Audit**: Only RDP, VNC, and protocol hosts can be configured.

1. Click **Edit Option**.

Figure 6-10 Edit Option



2. Select **File Manage**, **Uplink Clipboard**, **Downlink Clipboard**, **Keyboard Audit**, and/or **X11 forward**.
3. Click **OK**.

Step 6 Edit encode of hosts using SSH or Telnet protocol.

1. Click **Edit Host Encoding**.

2. Select the encode format. Options are **UTF-8**, **Big5**, and **GB 18030**.
3. Click **OK**.

Step 7 Edit OS type of multiple selected hosts.

1. Click **Edit OS Type**.
2. Select an OS type.
3. Click **OK**.

----End

Viewing and Editing Application Server Configurations

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Application** > **AppServer**.

Step 3 Query application servers.

- Quick search

  Enter a keyword in the search box and search for application servers by server name, server address, or application server account.

- Advanced search

  Enter keywords in the corresponding attribute search boxes to search for application servers in exact mode.

Step 4 Click the name of the application server you want to edit or click **Manage** in the **Operation** column in the row of the application server.

Step 5 View and edit basic information.

In the **Basic Info** area on the displayed page, click **Edit**. In the displayed dialog box, edit the basic information.

- You can edit **Server Name**, **Address**, **Port**, **Account**, **Password**, **Department**, **Program Path**, and **Remarks**.
- The **Protocol** cannot be modified.

----End

Batching Editing Application Server Configurations

Batching editing departments of multiple application servers

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Application** > **AppServer**.

Step 3 In the application server list, select the application servers you want to edit and click **More** in the lower left corner.

Step 4 Edit department of multiple selected hosts at a time.

1. Click **Edit Dept**.
2. In the displayed dialog box, select a department.

3. Click **OK**.

----End

Viewing and Editing Application Publish Configurations

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Application** > **Application**.

Step 3 Query application resources.

- Quick search

  Enter a keyword in the search box and search for application resources by name.

- Advanced search

  Enter keywords in the corresponding attribute search boxes to search for application resources in exact mode.

Step 4 Click the name of the application you want to edit or click **Manage** in the row of the application in the **Operation** column.

Step 5 View and edit basic information.

In the **Basic Info** area, click **Edit**. In the displayed dialog box, edit the basic information.

- You can edit the **App Name**, **AppServer**, **APP Port**, **APP Address**, **Department**, and **Remarks** fields.

Step 6 View and edit accounts of the application resource.

- To add an account for an application resource, click **Add** in the **Account** area and complete configurations in the displayed dialog box.
- To only remove an account, click **Remove** in the row of the account.

Step 7 View authorized users of the application resource.

Expand the **Authorized User** area to view information about system users who are authorized to manage the application.

----End

Batch Editing Configurations of Application Resources

- Batching editing departments of multiple application resources
- Batch editing options, including file management, clipboard, keyboard audit, and X11 forward functions, of multiple application resources

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Application** > **Application**.

Step 3 In the application resource list, select the application resource you want to edit and click **More** in the lower left corner.

Step 4 Edit department of multiple selected hosts at a time.

1. Click **Edit Dept**.
2. In the displayed dialog box, select a department.
3. Click **OK**.

Step 5 Edit options for multiple hosts.

1. Click **Edit Option**.
2. Select **File Manage** and/or **Clipboard**.
3. Click **OK**.

----End

Querying and Editing Account Configurations

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Account** in the navigation pane.

Step 3 Query application resources.

- Quick search

  Enter a keyword in the search box to quickly search for application resources by account, related resource, host address, and privileged account.

- Advanced search

  Enter keywords in the corresponding attribute search boxes to search for accounts in exact mode.

Step 4 Click the name of the account you want to edit or click **Manage** in the row of the account in the **Operation** column.

Step 5 View and edit basic information of the account.

In the **Basic Info** area on the displayed page, click **Edit**. In the displayed dialog box, edit the basic information.

- You can edit the **IS sudo**, **Password**, and **Remarks** fields.
- The **Account**, **Resource**, **Login Type**, **SSH Key**, and **Passphrase** fields cannot be modified.

Step 6 View and edit the account groups to which an account is added.

- To change the account groups that the account belongs to, click **Edit** in the **Joined Group** area and complete modifications in the displayed dialog box.
- To remove the account from an account group, click **Remove** in the row of the account group.

Step 7 View authorized users of the account.

Expand the **Authorized User** area to view information about system users who have been granted permissions to use the account.

----End

6.5.4 Exporting Resource Information

You can export resource information in batches from your bastion host so that you can have a local backup and edit basic resource information easily.

- To enhance information security of resources, you can encrypt resource information you export.
- The exported host resource file contains basic information, accounts, and plaintext passwords of managed hosts.
- The exported application server file contains basic information, path, account, and plaintext passwords of application servers.
- The exported application file contains basic information and account information, including plaintext passwords, of managed application resources.
- The exported account file contains basic account information, plaintext passwords, related resources, and related resource addresses.

Prerequisites

You have the operation permissions for the **Host**, **AppServer**, **Application**, and **Account** modules.

Batch Exporting Host Resource Information

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Host** in the navigation pane on the left.

Step 3 Select the hosts you want to export.

If no hosts are selected, information about all hosts is exported by default.

Step 4 Click **Export**.

Step 5 In the displayed **OK** dialog box, configure encryption options.

1. **Set encryption password**: This parameter is optional. If this parameter is not set, the downloaded file is an unencrypted CSV file. If you set a password, the downloaded file is an encrypted .zip file.
2. **User Password**: This parameter is mandatory. You are required to enter your login password for verification. The host resource file can be downloaded only after the verification is successful. This ensures password security of managed resource accounts.
3. Click **OK** to download the file locally.

----End

Batch Exporting Application Server Information

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Application** > **AppServer**.

Step 3 Select the application servers you want.

If no application servers are selected, information about all application servers is exported by default.

Step 4 Click **Export**.

Step 5 In the displayed **OK** dialog box, configure encryption options.

1. **Set encryption password**: This parameter is optional. If this parameter is not set, the downloaded file is an unencrypted CSV file. If you set a password, the downloaded file is an encrypted .zip file.
2. **User Password**: This parameter is mandatory. You are required to enter your login password for verification. The application server resource file can be downloaded only after the verification is successful. This ensures password security of managed resource accounts.
3. Click **OK** to download the file locally.

----End

Batch Exporting Application Resource Information

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Application** > **Application**.

Step 3 Select the application resources you want.

If no application resources are selected, information about all application resources is exported by default.

Step 4 Click **Export**.

Step 5 In the displayed **OK** dialog box, configure encryption options.

1. **Set encryption password**: This parameter is optional. If this parameter is not set, the downloaded file is an unencrypted CSV file. If you set a password, the downloaded file is an encrypted .zip file.
2. **User Password**: This parameter is mandatory. You are required to enter your login password for verification. The application resource information file can be downloaded only after the verification is successful. This ensures password security of managed resource accounts.
3. Click **OK** to download the file locally.

----End

Batch Exporting Accounts of Resources

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Account** in the navigation pane.

Step 3 Select the accounts you want to export.

If no accounts are selected, information about all accounts is exported by default.

Step 4 Click **Export**.

Step 5 In the displayed **OK** dialog box, configure encryption options.

1. **Set encryption password**: This parameter is optional. If this parameter is not set, the downloaded file is an unencrypted CSV file. If you set a password, the downloaded file is an encrypted .zip file.
2. **User Password**: This parameter is mandatory. You are required to enter your login password for verification. The account information file can be

downloaded only after the verification is successful. This ensures password security of managed resource accounts.

3. Click **OK** to download the file locally.

----End

6.5.5 Adding a Resource Account to an Account Group

This section describes how to add a resource account to an account group. A resource account can be added to multiple account groups.

Constraints

- The administrator of a superior department can add an account in the superior department to an account group in a lower-level department.
- If you have permissions for the **Account Group** module, you can remove an account of superior department out of the account group. However, as a user in a low-level department, you have no permissions to add those removed accounts back to your current account group.
- An account can be added to multiple account groups.

Prerequisites

You have the operation permissions for the **Account** module.

Adding an Account to an Account Group

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Account** in the navigation pane.

Step 3 In the **Operation** column of the account, click **Join**.

Step 4 In the displayed **Edit Account** dialog box, select one or more account groups and add the account to them.

Step 5 Click **OK**. You can then view the account groups that the account has been added.

----End

Adding Multiple Accounts to an Account Group

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Account Group** in the navigation pane.

Step 3 In the **Operation** column of the account, click **Add Account**.

Step 4 In the displayed **Add Account** dialog box, select accounts and add them to the account group.

Step 5 Click **OK**. You can view the added members on the **Account Group** page.

----End

6.6 Account Group

6.6.1 Overview

After you add multiple managed resource accounts to an account group, you can then authorize and authenticate accounts in batches by authorizing the corresponding account group.

Only system administrator **admin** or the user who has the account group management permission can manage account groups, including creating an account group, maintaining resources related to an account group, managing account group information, and deleting an account group.

An account group is associated with a department and does not belong to an individual. The account group created by the current login user belongs to the user's department by default. The department cannot be modified. A user with the account group management permission can view information about all account groups of the same or lower-level departments.

NOTE

- The administrator of a superior department can add accounts of the superior department to the account group of a lower-level department. If you are a user in the lower-level department and have permissions for the **Account Group** module, you can view only the list but not the details of the accounts added from the superior department.
- You can also remove an account of superior department out of the account group. However, as a user in a low-level department, you have no permissions to add those removed accounts back to your current account group.
- A resource account can be added to multiple account groups.

6.6.2 Creating an Account Group

This section describes how to create an account group.

Prerequisites

You have the operation permissions for the **Account** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Account Group** in the navigation pane.

Step 3 Click **New**. In the dialog box displayed, configure basic information about the group.

Table 6-12 Creating an Account Group

Parameter	Description
Account Group	Specifies user-defined user group name, which must be unique in a bastion host.
Remarks	(Optional) Provides supplementary information about the account group.

Step 4 Click **OK**. You can then view the newly created account group in the account group list and add account to it. For more details, see **Adding Accounts to an Account Group**.

----End

6.6.3 Deleting an Account Group

This topic describes how to delete an account group from a bastion host. Resource permissions granted to accounts in a deleted account group will become invalid.

Prerequisites

You have the operation permissions for the **Account** module.

Deleting an Account Group

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Account Group** in the navigation pane.

Step 3 To delete a single account group, click **Delete** in the **Operation** column of the account group.

Step 4 To delete multiple account groups at a time, select the ones you want to delete and click **Delete** at the bottom of the account group list.

----End

6.6.4 Querying and Editing Account Group Information

You can query and edit basic information and members of an account group.

Constraints

- As a system user who has permissions for the **Account** module, when you view account group, you can view accounts of your department and the superior department. However, for the accounts of the superior department, you can view only the account list but not the account details.
- If you have permissions for the **Account Group** module, you can remove an account of superior department out of the account group. However, as a user in a low-level department, you have no permissions to add those removed accounts back to your current account group.

Prerequisites

You have the operation permissions for the **Account** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Account Group** in the navigation pane.

Step 3 Query an account group.

Enter a keyword in the search box and search for an account group by name.

Step 4 Click the name of the account group you want to edit or click **Manage** in the row of the account group in the **Operation** column.

Step 5 In the **Basic Info** area, view the detailed information about the account group.

Click **Edit** in the area to modify the name and remarks of the account group.

Step 6 In the **Members** area, view information about all members in the account group.

- Click **Add**. In the displayed dialog box, add or remove member of the account group.
- In the row of a specific member, click **Remove** in the **Operation** column to remove the account from the account group.

----End

6.7 Managing Resource Labels

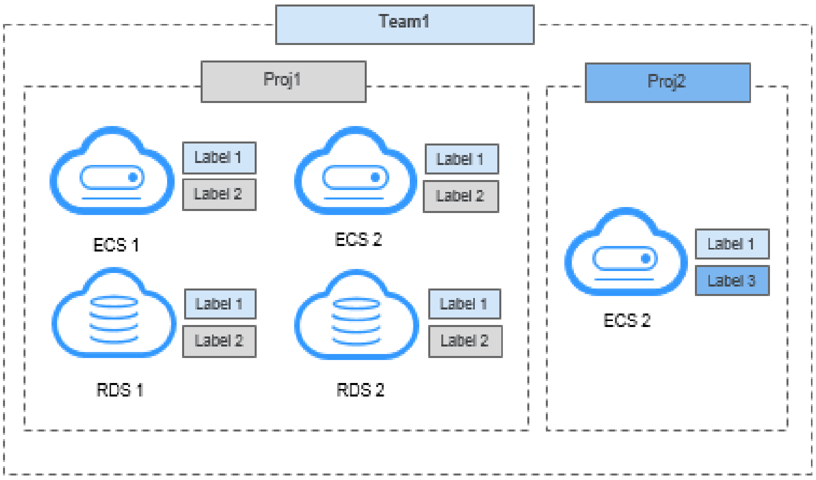
6.7.1 Overview

You can set labels to identify and group host and application resources managed in a bastion host. In this way, you can identify all resources related to a managed host or application resource.

After a label is added to a host or application, all managed resources related to the host or application will be labeled. In this way, you can search for resources by label. A host or application can have a maximum of 10 labels.

Figure 6-11 shows how labels work. Each managed resource, such as ECSs and RDS instances, is tagged with two labels. **Label 1** is identified by team, and **Label 2** and **Label 3** are identified by project. You can search for resources by label.

Figure 6-11 Examples of labels



After you add labels to resources, you can search for managed resources by label and manage labels. For more details, see **Table 6-13**.

Table 6-13 Label usage in CBH

Navigation Path	Operation
Dashboard > Recently Logged Host	Search for resources.
Dashboard > Recently Logged Application	Search for resources.
Dashboard > My Hosts	Search for resources.
Dashboard > My APPs	Search for resources.
Resource > Host	Add, delete, or edit labels and search for resources by label.
Resource > Application	Add, delete, or edit labels and search for resources by label.
Operation > Host Operation.	Add or delete labels and search for resources by label.
Operation > App Operation	Add or delete labels and search for resources by label.

6.7.2 Creating a Resource Label

You can define resource labels for your exclusive use. Labels cannot be shared among system users.

You can add labels to host or application resources when or after you add host or application resources. A host or application can have a maximum of 10 labels by default.

You can configure labels when you **add host resources** or **add application resources**. This topic describes how to add labels after host and application resources are added to your bastion host. Labels can be added through the resource management or operation modules. As an example, the following content walks you through how to add labels to a host resource in the **Host** module.

Prerequisites

You have the obtained the operation permissions for the **Host**, **Application Publish**, **Host Operations**, and **App Operations** modules.

Adding a Label

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Host** in the navigation pane on the left.

Step 3 Select the host you want to add a label and click **Add Label**. The **Add Label** dialog box is displayed.

Step 4 Type label information in the **Label** field and press **Enter** to create a customized label, or select an existing label from the **Label** drop-down list.

Step 5 Click **OK**. You can go to the **Host** page in the **Resource** module or the **Host Operation** page in the **Operation** module to view the new label of the managed host.

Step 6 Search for resources by label on. Go to the host or application list page in the **Resource** module, select a label from the drop-down list in the **Label** column to search for resources.

----End

6.7.3 Deleting a Resource Label

This topic describes how to delete a resource label.

Constraints

- After you confirm the deletion, all labels of the selected resource are deleted.
- If a label is not used by any resources, the system will delete it.

Prerequisites

You have the obtained the operation permissions for the **Host**, **Application Publish**, **Host Operations**, and **App Operations** modules.

Procedure

You can delete one or more labels from a managed resource. The following describes how to delete all labels from a managed host.

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Host** in the navigation pane on the left.

Step 3 Select a host and click **Delete Label** at the bottom of the host list. In the displayed **Delete Label** dialog box, click **Confirm**. All labels added to the host are then deleted.

Step 4 Go to the **Host** page in the **Resource** module or the **Host Operations** page in the **Operation** module to verify that labels are deleted.

NOTE

Additionally, you can go to the resource list page and click **Manage** in the host or application row. On the displayed page, delete the label of a managed host or application resource.

----End

6.8 Customizing OS Types

A bastion host can manage resource OS types and allows you to define custom operating system (OS) types.

A bastion host can manage 14 OS types by default, including Linux, Windows, Cisco, Huawei, H3C, DPtech, Ruijie, Digital China sm-s-g 10-600, Digital China sm-d-d 10-600, ZTE, ZTE5950-52tm, Surfilter, and ChangAn.

Constraints

- Only system administrator **admin** can modify the OS type configuration.
- The default OS type cannot be deleted or modified. Only the customized OS types can be deleted or modified.

Customizing OS Types

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **OS Type** to switch to the OS type list page.

Step 3 Click **New** to switch to the **New OS Type** dialog box and configure parameters.

Table 6-14 Parameters for creating an OS type

Parameter	Description
OS Type	Specifies the name of the custom OS type.

Parameter	Description
Chpw Param	Specifies the command of changing the account password and its return value. A maximum of 16 commands can be added. ● **password** indicates the old password. ● **new_password** indicates the new password. ● **change_user** indicates the account whose password needs to be changed. ● Brackets are not allowed.
Chpw Param for Sudo Login	Specifies the command of obtaining the permission for changing the account password and its success return. A maximum of 16 commands can be added. ● **password** indicates the old password. ● **new_password** indicates the new password. ● Brackets are not allowed.
Remarks	Provides brief introduction about the OS type.

Step 4 Click **OK**. The newly created OS type will be displayed in the OS type list.

Step 5 Manage customized OS types.

----End

Other Operations

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **OS Type** to switch to the OS type list page.

Step 3 Delete a customized OS type.

- To delete an OS type, click **Delete** in the **Operation** column of the row where the OS type locates.
- To delete multiple OS types, select the ones you want to delete and click **Delete** at the bottom of the OS type list to delete them together.

Step 4 View and edit the customized OS type configurations.

1. Click the name of the OS type you want to edit or click **Manage** in the row of the OS type in the **Operation** column.
2. Click **Edit** in the **Basic Info** area to edit the basic information of the OS type.

----End

6.9 Creating a Proxy Server

You can create a proxy server and use it to manage, operate, and maintain servers.

Prerequisites

You have the operation permissions for the **Host** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Resource** > **Host** in the navigation pane on the left.

Step 3 Click the **Proxy Server** tab and then **New**. In the displayed dialog box, edit the proxy server information.

Table 6-15 Proxy server parameters

Parameter	Description
Server Name	Name of the proxy server. You can enter 1 to 128 characters.
Proxy Type	Select a proxy type. Currently, only SOCKS5 is supported.
Server Address	The private or public IP address of the server that is created as the proxy server. The IP address must be able to communicate with the bastion host.
Port	Port for the proxy server to access. The default port for SOCKS5 is 1080. If a fixed port is set, enter the fixed port number.
Department	Select a department. If no department is available, create one.
Server Account	Username for the account for logging in to the proxy server.
Password	Password of the account for logging in to the proxy server.
Test connectivity	When creating a server, you can test its connectivity. You are advised to select this option. If this option is not selected, the connectivity of the proxy server cannot be ensured, so the server may fail to manage or maintain resources.

Step 4 Confirm the information and click **OK**.

----End

7 Policy

7.1 ACL Rules

7.1.1 Creating an ACL Rule and Associating It with Users and Resource Accounts

ACL Rules are used to control users' permissions for accessing resources.

With ACL rules, you can:

- Import rules in batches.
- Sort command rules by priority. The rule in the upper position has the higher priority than the ones in a lower position.
- Control access to managed resources from a wide range of dimensions, including the validity period, login period, user IP address, file transfer permission, file management permission, RDP clipboard function, keyboard audit, and operator watermark display function. ACL Rules are used to control users' permissions for resources.
  - Specify the validity period of the policy.
  - Restrict the time period during which the access is allowed or forbidden.
  - Restrict the users of certain source IP addresses to access managed resources.
  - Enable permissions for file transfer. This means you can enable or disable the function to upload files to managed resources or download files from managed resources.
  - Enable permissions for file management. This means you can enable or disable the function to view, delete, and edit files on the managed resources.
  - Grant permissions to use the RDP clipboard. This means you can enable or disable the RDP clipboard function.
  - Keyboard audit: You can enable this function to let the bastion host record all keyboard input information.

- Enable or disable watermarks on the web operation background. The watermark content is the login name of the current system user.

Constraints

- To grant the file upload/download permission, enable **File Transmission** and **File Manage**.
- Keyboard audit supports only RDP and VNC protocols.

Prerequisites

You have the operation permissions for the **ACL Rules** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **ACL Rules** to enter the ACL rule list page.

Step 3 On the displayed page, click **New** in the upper right corner of the page.

NOTE

You can also select a rule and choose **More** > **Insert** to create an ACL rule. After the configuration is complete, a new rule is created.

Step 4 Configure the basic information.

Table 7-1 Basic information about an ACL rule

Parameter	Description
Rule Name	Name of a user-defined ACL rule. The rule name must be unique in a bastion host.
Period of validity	Effective time and expiration time of an ACL rule
File Transmission	Permission to upload and download files during O&M. If **Upload** or **Download** is selected, **File Manage** must be selected in **Options** for the permission to take effect. ● If **Upload** and/or **Download** are selected, files can be uploaded and/or downloaded. ● If **Upload** and **Download** are deselected, files cannot be uploaded or downloaded.

Parameter	Description
Options	Permissions to manage files or file folders, use clipboards on hosts using the RDP protocol, audit keyboard inputs, and display watermarks of operators during O&M. **NOTE** ● The file management function is available for managed hosts logged using SSH or RDP. ● The file management function is unavailable for managed hosts using VNC. To manage files on such host resources, publish certain applications. ● The file management function is unavailable for managed hosts using Telnet.
Logon Time Limit	Time period during which managed resources can or cannot be accessed.
IP Limit	Source IP addresses by which users are allowed or forbidden to access resources. ● Select **Blacklist** and configure the IP addresses or IP address range to restrict users from these IP addresses from logging in to the resources. ● Select **Whitelist** and configure the IP addresses or IP address range to allow users from these IP addresses to log in to the resources. ● If no IP addresses are entered in the field, there is no login restriction on the managed host.

Step 5 Click **Next** and start to relate the command rule to one or more users or user groups.

- You can relate the ACL rule to multiple users or user groups at a time.
- After a user group is related to a command rule, users automatically obtain the permissions of the command rule the instant they are added to the user group.

Step 6 Click **Next** and start to relate the ACL rule to one or more accounts or account groups.

- You can relate an ACL rule to multiple managed resource accounts or account groups at a time.
- After an account group is related to an ACL rule, accounts automatically obtain the permissions of the ACL rule the instant they are added to the account group.

Step 7 Click **OK**. The system switches to the **ACL Rules** list, and you can then view the new ACL rule.

After you relate an ACL rule to users, the authorized users can view and access resources through the **Host Operations** and **App Operations** module.

NOTE

Users in the **Relate User** and **Relate User Group** must have been assigned a role that has the permissions for the **Host Operations** or **App Operations** module. Otherwise, the users cannot view the resource operation modules or access managed resources for operations.

----End

Importing ACL Rules in Batches

You can take the following steps to batch import ACL rules:

Step 1 Click in the upper right corner to download the batch import template and enter the access control policy information.

Step 2 In the dialog box displayed, click **Upload** to upload the completed access control list.

To overwrite the existing rules, select **Overwrite the existing opsStragegy**.

NOTE

Only XLS, XLSX, and CSV files can be uploaded.

Step 3 Click **OK**.

----End

Batch Importing ACL Rules

Click in the upper right corner of the list to export all data in the list.

Follow-up Operations

In your bastion host, you can manage all ACL rules on the rule list page, including managing related users or resources, deleting, enabling, or disabling one or more ACL rules, and sorting ACL rules by priority.

- To quickly relate a command rule to more users, user groups, accounts, or account groups, select the rule and click **Relate** in the **Operation** column.
- To delete a command rule, select the rule and click **Delete** in the **Operation** column.
- To disable command rules, select the ones you want to disable and click **Disable** at the bottom of the list. When the status of those rules changes to **Disabled**, they become invalid.
- To change the priority of a command rule, select the rule and drag and drop it to an upper or lower position.
- To manage ACL rules offline, click **Export** to export the details about all ACL rules in CSV format.

7.1.2 Setting Two-person Authorization

Two-person authorization, also known as two-person approval, adds an additional layer of resource security during O&M. After two-person authorization is configured, O&M personnel can access core resources only after being authorized and authenticated by the administrator onsite. Even if the O&M personnel account is lost, the information of business-critical resources will not be disclosed, reducing O&M risks and ensuring the security of critical assets.

Constraints

Only department administrators of the current and superior departments, including the system administrator **admin**, can be selected as the approvers for two-person authorization.

Prerequisites

- You have the operation permissions for the **ACL Rules** module.
- The ACL rule has been related to the system user and managed accounts.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **ACL Rules** to enter the ACL rule list page.

Step 3 Select an ACL rule you want to enable two-person approval, choose **More** > **Approver** in the **Operation** column. The **Edit Approvers** dialog box is displayed.

Step 4 Select one or more department administrators and set them as approvers of two-person authorization.

Step 5 Click **OK**.

----End

Follow-up Operations

After two-person authorization is successfully configured, double authorization is required when the user related to this rule accesses the resource.

The user needs to select an approver and enter the account password of the approver. The user then can access the resource only after the verification is successful.

7.1.3 Querying and Editing an ACL Rule

You can edit ACL rules to meet your changed O&M needs. For example, if your O&M personnel or resource permissions are changed, you can query involved ACL rules and edit their configurations, including basic permissions, related users, user groups, accounts, and account groups, and approvers of two-person authorization.

- A modified database rule takes effect the instant its status changes to **Enabled**.
- If related users have logged in to resources before the modification, those users need to log out and log in again for the modified database rule to take effect.

Prerequisites

You have the operation permissions for the **ACL Rules** module.

Querying and Editing Database Rule Configurations

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **ACL Rules** to enter the ACL rule list page.

Step 3 Query ACL rules.

- Quick search

  Enter a keyword in the search box to quickly query ACL rules by rule name, user, resource name, host IP address, resource account, time limit, or IP address limit.

- Advanced search

  Enter keywords in the corresponding attribute search boxes to search for database rules in exact mode.

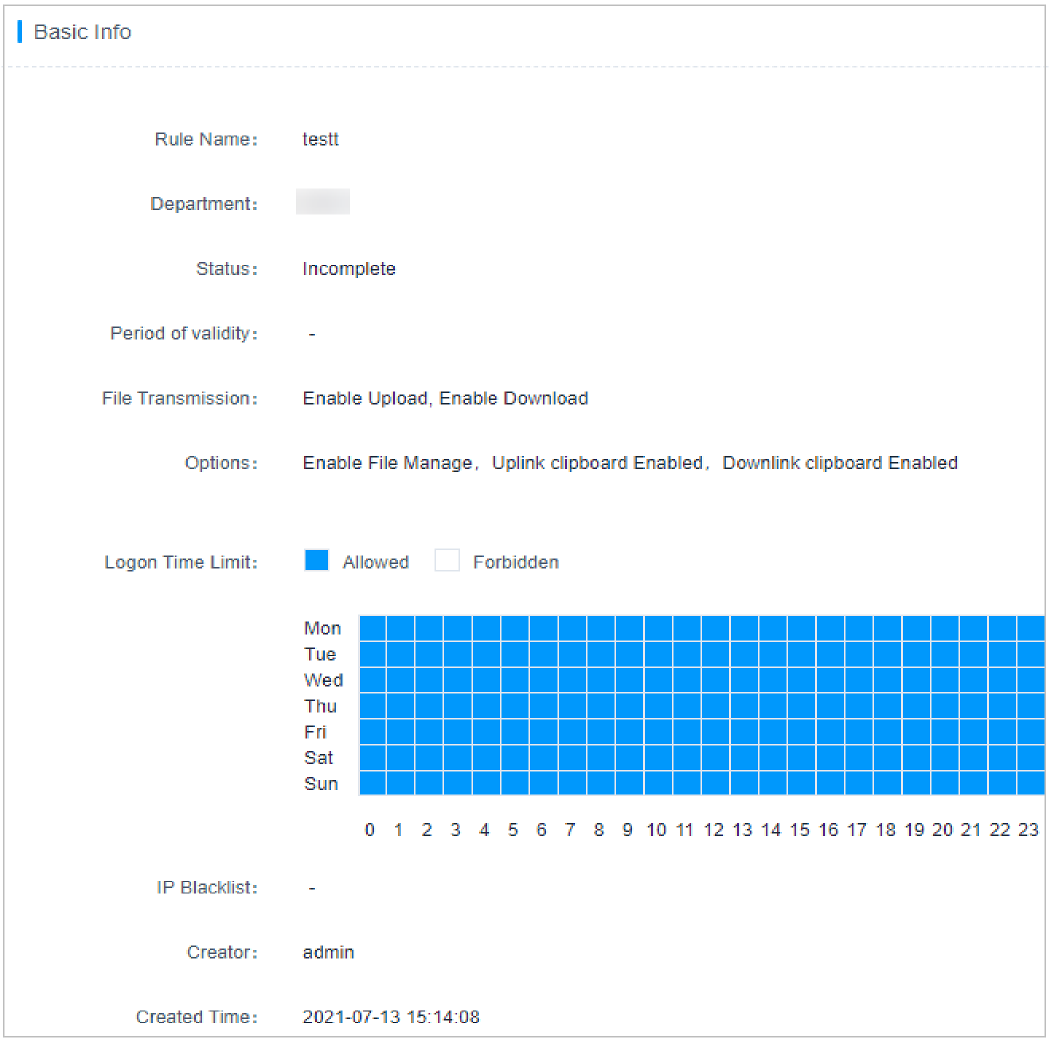
Step 4 Click the name of the database rule that you want to edit or click **Manage** in the row of the rule in the **Operation** column. The details page of the rule is displayed.

Step 5 View and edit basic information.

In the **Basic Info** area, click **Edit**. In the displayed dialog box, edit the database rule details.

You can modify configurations of **Rule Name**, **Period of validity**, **File Transmission**, **File Manage**, **Uplink clipboard**, **Downlink clipboard**, **Logon Time Limit**, **Keyboard Audit**, and **IP Limit**.

Figure 7-1 Viewing the basic information



Basic Info

Rule Name: testt

Department: [redacted]

Status: Incomplete

Period of validity: -

File Transmission: Enable Upload, Enable Download

Options: Enable File Manage, Uplink clipboard Enabled, Downlink clipboard Enabled

Logon Time Limit: ■ Allowed □ Forbidden

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Mon	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Tue	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Wed	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Thu	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Fri	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Sat	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Sun	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

IP Blacklist: -

Creator: admin

Created Time: 2021-07-13 15:14:08

Step 6 View and edit users related to the rule.

- To relate a user to the rule or remove a related user, click **Edit** in the **Users** area and complete modifications in the displayed dialog box.
- To only remove a related user, click **Remove** in the row of the related user.

Step 7 View and edit user groups related to the rule.

- To relate a user group to the rule or remove a related user group, click **Edit** in the **User Group** area and complete modifications in the displayed dialog box.
- To only remove a related user group, click **Remove** in the row of the related user group.

Step 8 View and edit accounts related to the database rule.

- To relate an account to the rule or remove a related account, click **Edit** in the **Account** area and complete modifications in the displayed dialog box.
- To only remove a related account, click **Remove** in the row of the related account.

Step 9 View and edit account groups related to the rule.

- To relate an account group to the rule or remove a related account group, click **Edit** in the **Account Group** area and complete modifications in the displayed dialog box.
- To only remove a related account group, click **Remove** in the row of the related account group.

Step 10 View and edit two-person authorization.

- To add or remove an approver, click **Edit** in the **Approver** area and complete modifications in the displayed dialog box.
- To only remove an approver, click **Remove** in the row of the approver.

----End

7.2 Command Rules

7.2.1 Creating a Command Rule

Command rules are used to control permissions for critical O&M operations on managed resources, implementing fine-grained control over the execution of commands on Linux hosts.

For hosts using SSH and Telnet protocols, a bastion host can record O&M session operations, trigger dynamic authorization, and disconnect connection to an operation session. A bastion host uses the guacd proxy to audit and filter the commands executed during operations based on the rule configured by the administrator. The proxy will return the audited commands, filtering results, and command output content for session operation recording, dynamic authorization, and disconnection.

With command rules, you can:

- Sort command rules by priority. The rule in the upper position has the higher priority than the ones in a lower position.
- Configure four command execution actions, including permitting, rejecting, requiring dynamic approval, and disconnecting the connection.
  - **Permit**: When a command rule is triggered, the system continues to execute the command. By default, all operations are allowed.
  - **Reject command**: After a command rule is triggered, the system rejects to execute the command and displays a message indicating that the command has been intercepted.
  - **Disconnect**: After a command rule is triggered, the system rejects to execute the command and disconnects the O&M session. The system displays a message indicating that the connection is forcibly disconnected by the administrator.
  - **Dynamic approval**: After a command rule is triggered, the system rejects to execute the command. The system displays a message indicating that the command has been intercepted and asking you to submit a command approval ticket. A command approval ticket is automatically generated. The command can be executed only after the ticket is submitted and approved.

Constraints

Command rules apply only to Linux hosts using the SSH or Telnet protocol for fine-grained permission control.

Prerequisites

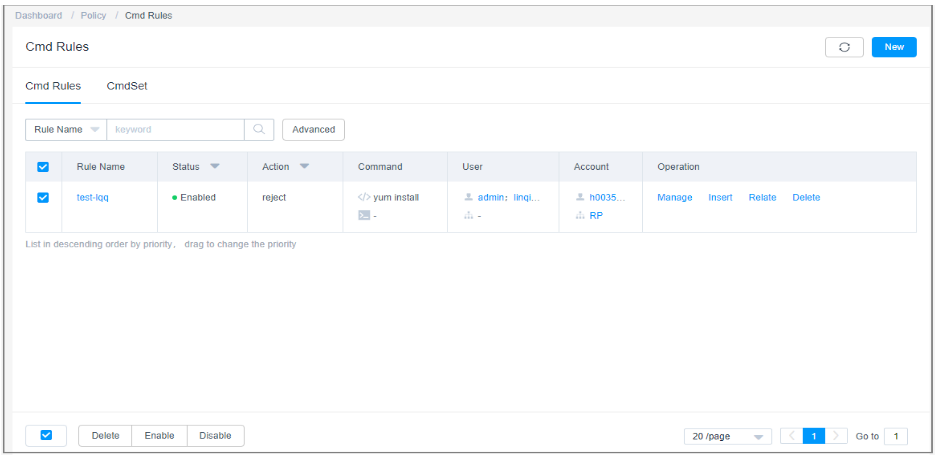
You have obtained the permissions to manage the **Cmd Rules** module.

Creating a Command Rule

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Cmd Rules** > **Cmd Rules**.

Figure 7-2 Cmd Rules



☑	Rule Name	Status	Action	Command	User	Account	Operation
☑	test-lqq	● Enabled	reject	yum install -	admin; linqi... -	h0035... RP	Manage Insert Relate Delete

List in descending order by priority, drag to change the priority

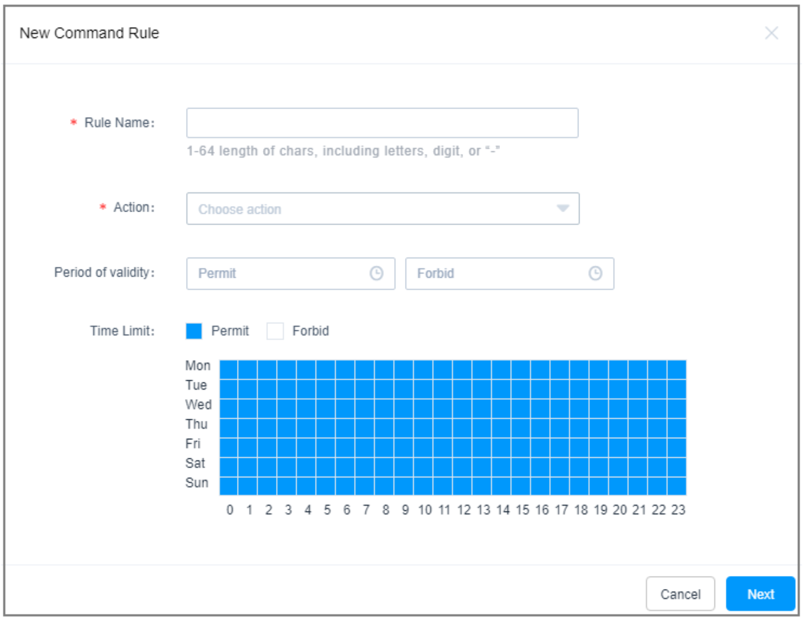
Step 3 Click **New** in the upper right corner of the page to switch to the **New Command Rule** dialog box.

NOTE

You can also select a command rule and choose **More** > **Insert** to create a command rule. After the configuration is complete, a new rule is created.

Step 4 Configure the basic information.

Figure 7-3 New Command Rule



New Command Rule

* Rule Name:

1-64 length of chars, including letters, digit, or "-"

* Action: Choose action

Period of validity: Permit Forbid

Time Limit: 🟦 Permit □ Forbid

Table 7-2 Basic information parameters

Parameter	Description
Rule Name	Name of a command rule. The rule name must be unique in a bastion host.
Action	Action executed by the command rule. The options are **Disconnect**, **Reject command**, **Dynamic approval**, and **Permit**. ● **Disconnect**: When a session runs the command to bring the rule into effect, the session is disconnected. ● **Reject command**: When a session runs the command to bring the rule into effect, the command is rejected directly. ● **Dynamic approval**: When a session runs the command to bring the rule into effect, the command is rejected directly. The command must be submitted to the administrator for approval to be executed. ● **Permit**: When a session runs the command to bring the rule into effect, the system runs the command.
Period of validity	Effective time and expiration time of the rule
Time Limit	Validity period of a rule

Step 5 Click **Next** and start to relate the command rule to one or more commands or command sets.

- **Relate Command**: Enter one command in each line. You can enter multiple commands. For more details, see **User-defined Commands That Can be Related to a Command Rule**.

- **Relate Command Set**: Relate the command rule to a created command set. For details about command sets, see **Managing Command Sets**.

Step 6 Click **Next** and start to relate the command rule to one or more users or user groups.

- After a user group is related to a command rule, users automatically obtain the permissions of the command rule the instant they are added to the user group.

Step 7 Select a created account or account group.

- After a command rule is related to an account group, accounts automatically obtain the permissions of the rule the instant they are added to the account group.

Step 8 Click **OK**. You can then view the created command rule in the rule list.

During O&M, when a command rule is triggered, the system executes configured actions accordingly.

NOTE

Users in the **Relate User** and **Relate User Group** must have been assigned a role that has ticket approval permissions. Otherwise, users cannot view the command approval ticket module or submit a ticket to obtain required permissions.

----End

Follow-up Operations

In your bastion host, you can manage all command rules on the rule list page, including managing related users or resources, deleting, enabling, or disabling one or more command rules, and sorting command rules by priority.

- To quickly relate a command rule to more users, user groups, accounts, or account groups, select the rule and click **Relate** in the **Operation** column.
- To delete a command rule, select the rule and click **Delete** in the **Operation** column.
- To disable command rules, select the ones you want to disable and click **Disable** at the bottom of the list. When the status of those rules changes to **Disabled**, they become invalid.
- To change the priority of a command rule, select the rule and drag and drop it to an upper or lower position.

7.2.2 Querying and Editing a Command Rule

This topic describes how to view and edit a command rule. You can view and edit the rule configurations, including the basic settings, related passwords, and related command sets. You can also edit the users, user groups, accounts, account groups related to the rule.

- A modified database rule takes effect the instant its status changes to **Enabled**.
- If related users have logged in to resources before the modification, those users need to log out and log in again for the modified database rule to take effect.

Prerequisites

You have obtained the permissions to manage the **Cmd Rules** module.

Querying and Editing Database Rule Configurations

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Cmd Rules** > **Cmd Rules**.

Step 3 Query command rules.

- Quick search

  Enter a keyword in the search box to quickly query command rules by rule name, user, resource name, host IP address, resource account, command set, command, or parameter.

- Advanced search

  Enter keywords in the corresponding attribute search boxes to search for database rules in exact mode.

Step 4 Click the name of the database rule that you want to edit or click **Manage** in the row of the rule in the **Operation** column. The details page of the rule is displayed.

Step 5 View and edit basic information.

In the **Basic Info** area, click **Edit**. In the displayed dialog box, edit the database rule details.

You can edit **Rule Name**, **Period of validity**, **Action**, and **Time Limit**.

Step 6 View and edit commands related to the rule.

- To edit related commands or parameters, click **Edit** in the **Command** area and complete modifications in the displayed dialog box.
- To only delete a related command, click **Remove** in the row of the related command.

Step 7 View and edit command sets related to the command rule.

- To relate a command set to the rule or remove a related command set, click **Edit** in the **Command Set** area and complete modifications in the displayed dialog box.
- To only delete a related command set, click **Remove** in the row of the related command set.

Step 8 View and edit users related to the rule.

- To relate a user to the rule or remove a related user, click **Edit** in the **Users** area and complete modifications in the displayed dialog box.
- To only remove a related user, click **Remove** in the row of the related user.

Step 9 View and edit user groups related to the rule.

- To relate a user group to the rule or remove a related user group, click **Edit** in the **User Group** area and complete modifications in the displayed dialog box.
- To only remove a related user group, click **Remove** in the row of the related user group.

Step 10 View and edit accounts related to the database rule.

- To relate an account to the rule or remove a related account, click **Edit** in the **Account** area and complete modifications in the displayed dialog box.
- To only remove a related account, click **Remove** in the row of the related account.

Step 11 View and edit account groups related to the rule.

- To relate an account group to the rule or remove a related account group, click **Edit** in the **Account Group** area and complete modifications in the displayed dialog box.
- To only remove a related account group, click **Remove** in the row of the related account group.

----End

7.2.3 Managing Command Sets

To relieve you from complicated and repetitive workloads on adding a large number of commands to command rules, a bastion host provides command sets, which include common commands and parameters used for Linux hosts and network devices.

This topic walks you through how to create, view, modify, delete, and batch import command sets.

Prerequisites

You have obtained the permissions to manage the **Cmd Rules** module.

Creating a Command Set

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Cmd Rules** > **CmdSet** to go to the command set list page.

Step 3 Create a command set.

1. Click **New** in the upper right corner of the page to switch to the **New Command Set** dialog box.
2. Configure the command set name.

   The command set name must be unique in a bastion host.
3. Click **OK**. You can then view the new command set on the **CmdSet** tab.

Step 4 Add commands to the command set.

1. In the row of the command set you want to add commands, click **Command** in the **Operation** column. The **Command** dialog box is displayed.
2. Select command sets or a single command.

   Currently, common commands for **Linux** and **Network devices** are preset in a bastion host.
3. Click **OK**.

----End

Querying and Editing a Command Set

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Cmd Rules** > **CmdSet** to go to the command set list page.

Step 3 Query a command set.

Quick search: Enter a keyword in the search box to quickly query command sets by command set name, command, and/or parameter.

Step 4 Click the command set name or click **Manage** in the row of the command set in the **Operation** column.

Step 5 View and edit basic information.

In the **Basic Info** area, click **Edit**. In the displayed dialog box, edit the basic information.

You can edit **CommandSet Name**. The **Department** cannot be changed.

Step 6 View and edit commands and parameters in the **Command** area.

- To add preset commands or parameters, click **Add** in the **Command** area and select preset commands in the displayed dialog box.
- To delete a command or parameter, locate the row containing the command or parameter you want to delete and click **Remove**.

----End

Deleting a Command Set

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Cmd Rules** > **CmdSet** to go to the command set list page.

Step 3 To delete one command set, click **Delete** in the **Operation** column of the row where the command set locates.

Step 4 To delete multiple command sets at a time, select the ones you want to delete and click **Delete** at the bottom of the list to delete all selected command sets together.

----End

Batch Importing Command Sets

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Cmd Rules** > **CmdSet** to go to the command set list page.

Step 3 Click ⇲ in the upper right corner. In the displayed dialog box, download the template.

Step 4 Complete the template. Click **Upload** to import.

You can choose to overwrite existing command sets.

NOTE

Only XLS, XLSX, and CSV files can be uploaded.

Step 5 Confirm the information and click **OK**.

----End

7.2.4 Defining Custom Related Commands

After a custom command is related to a command rule, the bastion host determines whether to execute the command based on the command rule.

Custom related commands are case-sensitive. If the command to execute is inconsistent with the configured one, the command rule will fail to be triggered. The following examples are for your reference:

- Single command format

  If you want to configure a rule to deny the **ls** command, set the related command of the rule to **ls**. The rule is triggered when the single command **ls** is executed.

- Single command and path format

  If you want to configure a rule to dynamically authorize the log query actions, set the related command of the rule to **ls /var/log/**. The rule is triggered when the command **ls /var/log/** is executed. If the **ls /var/log** command is executed, the rule fails to be triggered.

- Commands that contain the wildcard character (*), which indicates one or more characters.

  If you want to configure a rule to deny all deletion commands, set the related command of the rule to **rm ***. The rule is triggered when the command **rm -rf** is executed; while the rule will fail to be triggered if the **rm** command is executed.

- Commands that contain the question mark (?), which indicates any single character. The number of entered question marks indicates the number of unknown characters.

  If you want to configure a rule to deny commands that will delete files or file directories containing two certain characters, set the related command to **rm -rf ??**. The rule is triggered when the command **rm -rf ts** is executed. The rule will fail to be triggered if the **rm -rf test** command is executed.

- Commands that contain a string or any characters enclosed in square brackets ([]) or negated ones in square brackets (using a vertical bar (|) or caret (^) to negate)

  If you want to configure a rule to dynamically approve commands that will delete files or file directories containing any characters in the string "abcd", set the related command of the rule to **rm -rf [abcd]**. The rule is triggered when the command **rm -rf cloud** is executed. The rule will fail to be triggered if the **rm -rf test** or **rm -rf ABCD** command is executed.

7.3 Password Rules

7.3.1 Creating a Password Rule

With password rules, you can let the bastion host periodically change the passwords of multiple managed host resources at a time, improving the managed resource account security.

With password rules, you can:

- Change passwords of managed resource accounts manually, periodically, or at a scheduled time.
- Change the passwords of multiple managed resource accounts to different passwords randomly generated by the system, the same password generated by the system, or the same password you specify.

Constraints

- Password change rules apply only to hosts configured with SSH, MySQL, SQL Server, Oracle, RDP, or Telnet protocols.
- To enable a password change rule for Windows hosts, enable the SMB service and open port 445 in the security group.
- Before relating to an account of a Windows 10 resource, set server parameters by referring to **Setting Parameters of Windows 10 Servers**.

Prerequisites

- You have the operation permissions for the **Password Rules** module.
- The configured OS type of the resource whose account password you want to change must be the same as the actual OS type of the resource.

Creating a Password Change Rule

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Password Rules** > **Password Rule**.

Step 3 Click **New** in the upper right corner of the page to switch to the **New ChangePassword Rule** dialog box.

Step 4 Configure the basic information.

Table 7-3 Parameter for password change rules

Parameter	Description
Rule Name	Name of a password change rule. The rule name must be unique in a bastion host.

Parameter	Description
Timing	The options are **Manual**, **Fixed-Time**, and **Cycle**. ● **Manual**: Manually trigger the password change rule to change the password of the managed resource account. ● **Fixed-Time**: The password change rule is triggered by the bastion host to change the password of the managed resource account at a fixed time. This type of rule is executed only once. ● **Cycle**: The password change rule is periodically triggered by the bastion host to change the passwords of the managed resource accounts. This type of password change rule is triggered periodically.
Execute Time	Date when the password change rule is executed. The default execution time is at 00:00 every day.
Cycle Frequency	Password change interval. ● The unit is day. ● You need to set the **End Time** for this type of rules. Otherwise, the rule will be executed indefinitely.
Method	How the password is changed. The options are **Generate different passwords**, **Generate the same password**, and **Specify the same password**. ● Generating a different password: The system randomly generates different passwords for managed resource accounts in compliance with password requirements. ● Generating the same password: Randomly generate the same password for managed resource accounts in compliance with password requirements. ● Specifying the same password: You manually change passwords of managed resource accounts to the same preset password you specify. **NOTE** A password randomly generated by a bastion host contains 20 characters, including uppercase letters, lowercase letters, digits, and the following special characters %, -, _, and? A random password must contain at least an uppercase letter, a lowercase letter, and a special character.

Parameter	Description
Options	The following options are supported: ● **Allow to change the sudo account password**: To change the password of sudo account, select this option, or the password of the sudo account cannot be changed. This option is not selected by default. ● **Priority use of the sudo account to change password**: To let the system automatically search for the corresponding sudo account and use it to change the account password, select this option. If no sudo account is available, the password can be changed using the current account. This option is selected by default. ● **Allow to change the SSH Key**: To let the system automatically change SSH public keys, select this option. NOTE ● The **Allow to change the SSH Key** option is supported in version 3.3.36.0 and later only. To use this function, upgrade your bastion host to the latest version by referring to **Upgrading the CBH System Version**. ● If you select the key pair automatic login mode when managing host resources, enable **Allow to change the SSH Key**, or manual password change may fail.

Step 5 Click **Next** and start to relate the ACL rule to one or more accounts or account groups.

- After a password change rule is related to an account group, accounts automatically obtain the permissions of the rule the instant they are added to the account group.
- If a password change rule is related to multiple managed resource accounts, batch changing passwords is available.

Step 6 Click **OK**. You can then view the new password change rule in the rule list.

To obtain the new password of the managed resource accounts, export host resource details by referring to **Batch Exporting Host Resource Information**.

Step 7 Click **Execute** in the **Operation** column. In the dialog box displayed, confirm the execution. The policy updates passwords immediately.

----End

Setting Parameters of Windows 10 Servers

Step 1 Log in to a Windows 10 server.

Step 2 Start the Windows Remote Management (WinRM) service.

1. Search for **Windows Components**.
2. In the navigation pane on the left, choose the local service. In the window displayed on the right, locate **Windows Remote Management(WS-Management)**.

3. Right-click **Windows Remote Management(WS-Management)** and choose **Start** from the shortcut menu.

Step 3 Configure WinRM.

1. Run the **cmd** command as the administrator and run the following command:
```
winrm qc
```
2. Perform twice. After the command output is displayed, enter **y** as prompted.
3. Run the following commands:
```
winrm set winrm/config/service '@{AllowUnencrypted="true"}'
```
4. Run the following commands:
```
winrm set winrm/config/service/auth '@{Basic="true"}'
```

Step 4 (Skip this step if you are already an administrator.) Run the following command to add a user to the user group:

For example, run the following command to add **appuser01** to the user group:

```
net localgroup "Remote Management Users"  appuser01  /add
```

Step 5 In the power shell dialog box, run the following command to add a firewall:

```
New-NetFirewallRule -DisplayName "WinRM-5985" -Direction Inbound -LocalPort 5985 -Protocol TCP -
Action Allow
```

----End

Follow-up Operations

You can manage all password change rules on the rule list page, including managing related resources, deleting, enabling, or disabling one or more password change rules, and immediate execution of a password change rule.

- To quickly relate a synchronization rule to more accounts or account groups, select the rule and click **Relate** in the **Operation** column.
- To delete a command rule, select the rule and click **Delete** in the **Operation** column.
- To disable password change rules, select the ones you want to disable and click **Disable** at the bottom of the list. When the status of those rules changes to **Disabled**, they become invalid.
- To change the password of a managed account immediately, click **Execute** in the **Operation** column.

7.3.2 Querying and Editing a Password Rule

You can edit password rules to meet your changed O&M requirements. For example, you can edit when and how a password rule is executed and which accounts, account groups, and resources a password rule is used for.

A modified database rule takes effect the instant its status changes to **Enabled**.

Prerequisites

You have the operation permissions for the **Password Rules** module.

Querying and Editing Rule Configurations

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Password Rules** > **Password Rule**.

Step 3 Query password rules.

- Quick search

  Enter a keyword in the search box to quickly query password change rules by rule name, resource name, and account,

- Advanced search

  Enter keywords in the corresponding attribute search boxes to search for database rules in exact mode.

Step 4 Click the name of the rule that you want to edit or click **Manage** in the row of the rule in the **Operation** column. The details page of the rule is displayed.

Step 5 View and edit basic information.

In the **Basic Info** area, click **Edit**. In the displayed dialog box, edit the database rule details.

- You can edit **Rule Name**, **Timing**, **Method**, and **Options**.
- The **Department** cannot be modified.

Step 6 View and edit accounts related to the database rule.

- To relate an account to the rule or remove a related account, click **Edit** in the **Account** area and complete modifications in the displayed dialog box.
- To only remove a related account, click **Remove** in the row of the related account. The rule becomes invalid for the deleted account.

Step 7 View and edit account groups related to the rule.

- To relate an account group to the rule or remove a related account group, click **Edit** in the **Account Group** area and complete modifications in the displayed dialog box.
- To only remove a related account group, click **Remove** in the row of the related account group. The rule becomes invalid for all accounts in the deleted account group.

----End

7.3.3 Managing Password Logs

After a password rule is executed, logs are generated accordingly. You can view the password change details in password change logs.

Prerequisites

You have the operation permissions for the **Password Rules** module.

Viewing Log Details

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Password Rules** > **Password Log** to view and manage password change logs.

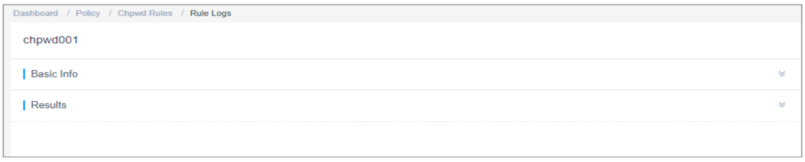
Step 3 Query password change logs.

Quick search: Enter a keyword in the search box and search for password change logs by rule name.

Step 4 Select the password change log and click **Detail**.

You can view the log content, including the basic information and password change result.

Figure 7-4 Viewing password log details



----End

Downloading Password Logs

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Password Rules** > **Password Log** to view and manage password logs.

Step 3 Click **Download**.

Step 4 Confirm downloading information.

1. **Set encryption password**: This parameter is optional. If this parameter is not set, the downloaded password change log is an unencrypted CSV file. If you set a password, the downloaded password change log is an encrypted .zip file.
2. **User Password**: This parameter is mandatory. You need to enter the login password of the current user and then the password change log can be downloaded only after the verification is successful. This ensures password security of managed host accounts.
3. Click **OK** to download the file locally.

----End

Deleting Execution Logs

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Password Rules** > **Password Log**.

Step 3 To delete one execution log, select the one you want and click **Delete** in the **Operation** column to delete it.

Step 4 To delete multiple execution logs at a time, select the ones you want and click **Delete** at the bottom of the list to delete all selected logs together.

----End

7.4 Account Synchronization Rules

7.4.1 Creating a Synchronization Rule

Synchronization rules are used to automatically synchronize managed host accounts, making it easier for you to manage accounts of managed hosts, delete zombie accounts, and discover accounts that are not managed in a timely manner. This further strengthens management of resources.

With synchronization rules, you can:

- Synchronize accounts from managed hosts manually, periodically, or at a scheduled time.
- Pull accounts from managed hosts, check the validity of pulled accounts, and update the managed resource account status.
- Update the password of a host account, create a host account, or delete invalid host accounts by pushing managed resource account information to the corresponding hosts.

Constraints

- The account synchronization is supported only in professional editions.
- Account synchronization rules apply only to hosts using the SSH protocol.
- Only one managed resource account is allowed to log in to a managed host and pull its account information.

Prerequisites

You have the operation permissions for the **Sync Rules** module.

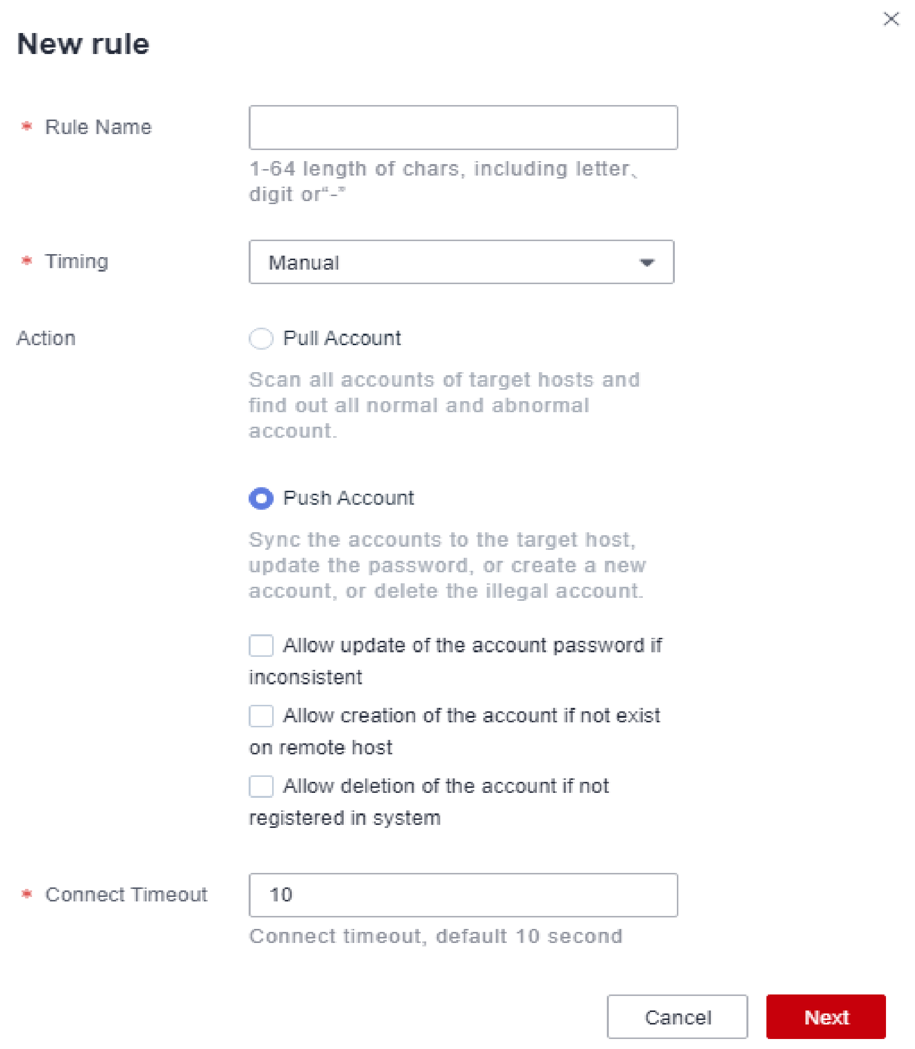
Creating a Synchronization Rule

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Sync Rules** > **Sync Rules**.

Step 3 Click **New** in the upper right corner of the **Sync Rule** area to switch to the **New rule** dialog box.

Figure 7-5 New rule



New rule

* Rule Name

1-64 length of chars, including letter、digit or"-"

* Timing: Manual

Action

○ Pull Account

Scan all accounts of target hosts and find out all normal and abnormal account.

● Push Account

Sync the accounts to the target host, update the password, or create a new account, or delete the illegal account.

□ Allow update of the account password if inconsistent

□ Allow creation of the account if not exist on remote host

□ Allow deletion of the account if not registered in system

* Connect Timeout: 10

Connect timeout, default 10 second

Step 4 Configure the basic information.

Table 7-4 Parameters for configuring an account synchronization rule

Parameter	Description
Rule Name	Name of an account synchronization rule. The rule name must be unique in a bastion host.

Parameter	Description
Timing	The options are **Manual**, **Fixed-Time**, and **Cycle**. You need to configure the execution time if **Fixed-Time** or **Cycle** is selected. ● **Manual**: Manually trigger the rule to change the password of the managed resource accounts. ● **Fixed-Time**: The rule is triggered by the bastion host to change the password of the managed resource account at a fixed time. This type of rule is executed only once. ● **Cycle**: The rule is periodically triggered by the bastion host to change the password of the managed resource account. This type of rule is triggered periodically.
Execute Time	Date when a policy is periodically executed. The default execution time is at 00:00 every day.
Cycle Frequency	Account synchronization frequency. ● The options are every minute, every hour, every day, every week, and every month. ● You need to set the **End Time** for this type of synchronization rules. Otherwise, the rule will be executed indefinitely.
Action	Synchronization mode. By default, **Pull Account** is selected. ● **Pull Account**: Scans all accounts of a host and collects statistics on all normal and abnormal accounts. ● **Push Account**: Pushes accounts to a host to automatically update account passwords, create accounts, or delete invalid accounts of the host. **NOTE** When the synchronization mode is set to push account, the following three options are available: – If the account and password are inconsistent, the password can be updated. – If the account does not exist, the account can be created. – If a non-managed account exists on the host, the account can be deleted.
Connect Timeout	Timeout interval for connecting to a managed host. If the connection times out, the account synchronization task is interrupted. ● The default value is 10 seconds.

Step 5 Click **Next** and start to relate the synchronization rule to one or more accounts or account groups.

- Only one account can be configured for each host to execute synchronization tasks.

Step 6 Click **OK**. You can then view the new synchronization rule in the rule list.

To obtain the account synchronization details, **download the synchronization logs** after the synchronization.

----End

Follow-up Operations

You can manage all synchronization rules on the rule list page, including managing related resources, deleting, enabling, or disabling one or more synchronization rules, and immediately executing a synchronization rule.

- To quickly relate a synchronization rule to more accounts or account groups, select the rule and click **Relate** in the **Operation** column.
- To delete a command rule, select the rule and click **Delete** in the **Operation** column.
- To disable synchronization rules, select the ones you want to disable and click **Disable** at the bottom of the list. When the status of those rules changes to **Disabled**, they become invalid.
- To execute a synchronization rule immediately, click **Execute** in the **Operation** column.

7.4.2 Querying and Editing a Synchronization Rule

You can edit a synchronization rule to meet your changed requirements. For example, you can edit when and how a synchronization rule is executed and which accounts, account groups, and resources a synchronization rule is used for.

A modified rule takes effect the instant its status changes to **Enabled**.

Prerequisites

You have the operation permissions for the **Sync Rules** module.

Querying and Editing Rule Configurations

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Sync Rules** > **Sync Rules**.

Step 3 Query account synchronization rules.

- Quick search

  Enter a keyword in the search box to quickly query rules by rule name, resource name, and account,

- Advanced search

  Enter keywords in the corresponding attribute search boxes to search for rules in exact mode.

Step 4 Click the name of the rule that you want to edit or click **Manage** in the row of the rule in the **Operation** column. The details page of the rule is displayed.

Step 5 View and edit basic information.

In the **Basic Info** area, click **Edit**. In the displayed dialog box, edit the rule details.

- You can edit **Rule Name**, **Timing**, and **Action**.
- The **Department** cannot be modified.

Step 6 View and edit accounts related to the rule.

- To relate an account to the rule or remove a related account, click **Edit** in the **Execute Account** area and complete modifications in the displayed dialog box.
- To only remove a related account, click **Remove** in the row of the related account. The removed account then cannot be used for synchronizing accounts of the corresponding host.

Step 7 View and edit account groups related to the rule.

- To relate an account group to the rule or remove a related account group, click **Edit** in the **Account Group** area and complete modifications in the displayed dialog box.
- To only remove a related account group, click **Remove** in the row of the related account group. Each account in the removed account group cannot be used for synchronizing accounts of the corresponding host.

----End

7.4.3 Managing Synchronization Execution Logs

After a synchronization rule is executed, execution logs are generated accordingly. You can view the account synchronization result in the execution logs, including the synchronized account information, new account information, and deleted account information.

Prerequisites

You have the operation permissions for the **Sync Rules** module.

Viewing Log Details

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Sync Rules** > **Sync Log**.

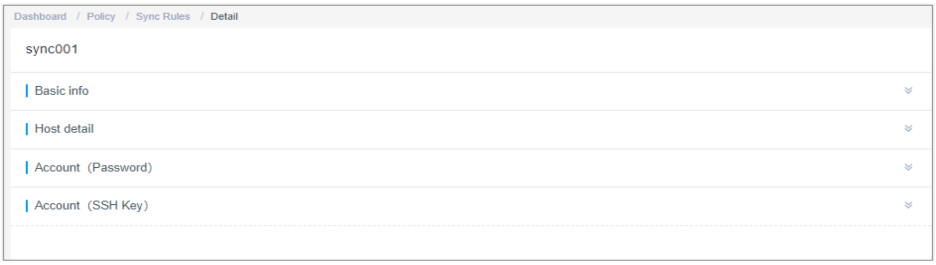
Step 3 Query OM task execution logs.

Quick search: Enter a keyword in the search box and search for execution logs by rule name.

Step 4 Select the execution log and click **Detail**.

You can view the basic information, host details, account list for synchronizing passwords, and account list for synchronizing SSH keys.

Figure 7-6 Viewing the basic information



Dashboard / Policy / Sync Rules / Detail

sync001

----End

Downloading OM Task Execution Logs

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Sync Rules** > **Sync Log**.

Step 3 Select the execution log and click **Download** to download the log in CSV format.

----End

Deleting Execution Logs

Step 1 Log in to your bastion host.

Step 2 Choose **Policy** > **Sync Rules** > **Sync Log**.

Step 3 Select an execution log and click **Delete** in the row to delete it.

Step 4 To delete multiple execution logs at a time, select the ones you want and click **Delete** at the bottom of the list to delete all selected logs together.

----End

8 Ticket

8.1 Ticket Configuration Management

8.1.1 Configuring the System Ticket Modes

A ticket mode consists a series of ticket settings which restrict the resource scope that can be applied for through an access control ticket and the method a ticket is submitted. There are two modes of ticket settings:

- **Basic Settings**: In this mode, you can restrict the access scope of resources that can be applied for through an access control ticket and specify the way to submit a command control ticket.
- **Advanced Settings**: In this mode, you can restrict the access scope of resources that can be applied for through access control ticket from multiple dimensions, such as the user department, user role, and resource department.
  - After a **User Department** is configured, users in the department form a user pool. Only users in the user pool can apply for resources in the resource pool.
  - If no **User Role** is configured, all users in the user pool can apply for resources in the resource pool.
  - If **User Role** is configured, only users of specified roles in the user pool can apply for resources in the resource pool.
- A user pool is a group of users specified by the user department and user role. After a department or role is associated, users of the department or role can apply for resources in the resource pool.
- A resource pool is a group of resources specified by the resource department. After a department is associated, the resources of the department can be applied for by users in the user pool.

This topic describes how to configure the ticket mode.

Prerequisites

You have the management permissions for the **System** module.

Configuring the Basic Ticket Settings

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Ticket**.

Step 3 In the **Basic Settings** area, click **Edit**.

Set the **Application scope** of resources that can be viewed by the user and the **Submission mode** of command approval ticket.

Table 8-1 Parameter description

Parameter	Description
Application scope	Specifies the scope of resources that can be applied for with the access control ticket. ● The default value is the current department. ● **This Department**: When applying for access control tickets, you can apply for the access control permission on the resources of the current department, excluding the resources of lower-level departments. ● **This Dept and lower level**: When applying for access control tickets, you can apply for access control permissions for resources of the current department and lower-level departments. ● **All**: You can apply for access control permissions for all system resources.
Submission mode	Specifies the way to submit a ticket. The options are **Manual** and **Auto**. ● By default, **Manual** is selected. ● **Manual**: After a command control ticket is generated, submit the ticket to the administrator for approval. ● **Auto**: After a command control ticket is generated, it is automatically submitted to the administrator for approval.

Step 4 Click **OK**. You can then view the configured ticket settings.

----End

Configuring the Advanced Ticket Settings

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Ticket**.

Step 3 In the **Advanced Settings** area, click **Edit**.

Step 4 Configure the user pool.

Select user department or user role.

Step 5 Click **Next** and configure resource department.

Step 6 Click **OK**. You can then view the configured ticket settings.

----End

Follow-up Operations

- To modify the resource pool and user pool in a certain piece of advanced settings, click **Edit** in the corresponding row. In the displayed dialog box, select other user and/or resource departments.
- To delete the restrictions of a certain piece of advanced settings, click **Delete** in the corresponding row. Deleted authentication information cannot be recovered. Exercise caution when performing this operation.

8.1.2 Configuring the Ticket Approval Process

The ticket approval process is the policy that specifies how to approve a system ticket. You can customize the approval process in terms of the approval process mode, approval form, approval node, approval series, and final approval node to enhance the management of the ticket approval process. The following are some major factors in an approval process:

- Approval process type

  There are two types of application processes, the hierarchical process and fixed process. The hierarchical process is applicable to the approval within a department, and the fixed process is applicable to approval across departments.
- Approval form

  Approval form is used to specify how a ticket is approved when multiple approvers are involved in the approval process. There are two forms, multiplayer approval and countersign approval. In multiplayer approval form, a ticket is approved as long as it is approved by any of the approvers. In countersign approval form, a ticket is approved only after it is approved by all approvers.
- Approval node

  Approval node is used to specify attributes of the approver in the approval process, including the department and role attributes. The department administrator who meets the department and role requirements has the approval permission.
- Approval series

  Approval series refers to the number of approval levels. If you select the hierarchical approval process, the approval series must be specified.
- Final approval node

  After approvals at other levels complete, **admin** performs the final approval.

This topic describes how to customize a ticket approval process.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Ticket**.

Step 3 In the **Approval process** area, click **Edit**.

In the displayed **Approval process** dialog box, specify required parameters.

Table 8-2 Parameters for configuring ticket approval processes

Parameter	Description
Approval process type	Approval process. The options are **Classification** for hierarchical process and **Regular** for fixed process. After the ticket approval process is configured, the ticket goes to each approver in sequence for approval. If there is no qualified approver at one stage, the ticket is approved at this stage by default. Then the ticket is routed to the next stage. ● By default, the hierarchical process mode is used. ● Hierarchical process: Approval is performed level by level based on the approval level. ● Fixed process: Approval is performed based on the fixed approval node. NOTE You can send an email to notify the approver of the ticket status in either of the following ways: – Set an outgoing email address by referring to **Configuring the Outgoing Mail Server** and ensure that emails can be sent properly. – On the **Ticket** tab, set the alarm level to **High**. For details, see **Configuring Alarm Levels**.
Approval form	How the approval is performed. The options are **Multiplayer** and **Countersign**. ● The multiplayer approval mode is used by default. ● **Multiplayer**: indicates that an approval from only one approver at each level is required. After the ticket is approved at a certain level, it becomes invisible to other approvers at the same level. If a ticket is rejected by any approver at the same level, the ticket is rejected. ● **Countersign**: A ticket will not be transferred to the next level for approval until all approvers at the same level approve the ticket. If any approvers reject the ticket, the ticket is rejected. ● During the approval process, the admin account can review all tickets on any node, and the review result is the final result.

Parameter	Description
Approval node	Set the approver attribute of the node. The department attribute and role attribute must be set. After the setting is complete, the users who meet the department and role requirements automatically become the approvers of the node. If no users meet the department and role requirements, the system automatically searches for qualified users in the superior department until **HQ** is reached. ● Department attribute: includes **User department** and **Resource department**. ● **Role attribute**: The role must have the administrator and ticket approval permissions. The default role is the department administrator. For example, if you select **User department**, the administrator of the department to which the ticket applicant belongs is select as the approver. If you select **Resource department**, the administrator of the department to which the resource belongs is selected as the approver.
Approval series	Number of approval levels. If you select **Classification** for approval process, this parameter is mandatory. ● A maximum of five levels of approval series can be set. ● The default value is **1**, indicating that an approval level is required.
Final approval node	Whether to enable final approval by **admin**. Final approval is enabled by default (●). ● ○: indicates that final approval by **admin** is disabled. ● ●: indicates that final approval by **admin** is enabled. This means the ticket cannot be approved until all approvers in other levels approve it and the **admin** user approves it. **NOTE** If no qualified approvers at all approval levels, the approval from the **admin** user is required no matter whether the final approval is enabled.

Step 4 Click **OK**. You can then view the configured ticket approval process.

----End

8.2 ACL Ticket

If you have no permissions to access some resources, you can submit a ticket to apply for the required permissions.

This topic describes how to create and manage ACL tickets.

Prerequisites

You have the management permissions for the **ACL Ticket** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Tickets** > **ACL Ticket**.

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

In the displayed **New ACL ticket** page, configure basic information.

Table 8-3 Parameters for configuring an ACL ticket

Parameter	Description
Operation Time	Specifies the time period for accessing the resource. The start time and end time must be set.
File Transmission	File transfer permissions, including uploading and downloading files.
Options	Whether to enable the functions in the session window when a web browser is used for O&M. ● **File Manage**: Permissions to manage files or folders. If **Upload** or **Download** is selected for **File transfer**, **File Manage** must be enabled. ● **uplink clipboard** and **downlink clipboard**: Permissions to use the clipboard function on hosts with **Protocol** set to **RDP**. ● **Watermark**: Permissions to display the watermark of the user login name in the operation session window.
Remarks	(Optional) Briefly describe the reason for applying for the resource access control permission or other information.

Step 4 Click **Next** and select an account for which the permissions are applied.

Step 5 Click **OK** to submit the ticket.

After the administrator approves the ticket, you obtain the access permission for the resources.

----End

Follow-up Operations

- After a ticket is submitted, the administrator will receive a notification in the message center. They can view the ticket details. The ticket will also display in the ticket approval page. The administrator can choose to approve or reject the ticket.
- To modify a submitted ticket, click **Withdraw** to cancel the ticket. Then, the ticket status changes to **Revoked**.
- To view or modify the ticket information after the ticket is created, click **Manage** to go to the ticket details page.

NOTE

For tickets in the **approving** status, you can only view the details but cannot modify the content. Only the ticket in the **Revoked** or **Not submitted** state can be modified.

- If a submitted ticket has expired, click **Delete** to delete it. You can also select multiple tickets and click **Delete** in the lower left corner to delete them in batches.

CAUTION

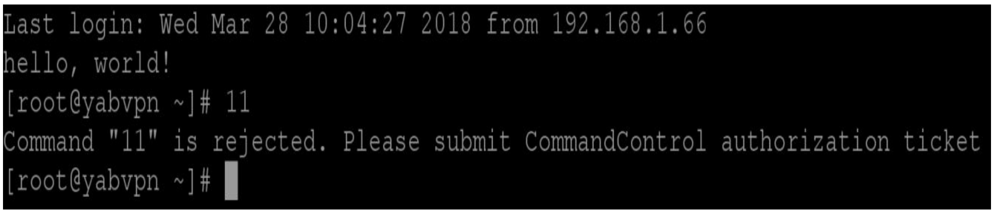
Deleted tickets cannot be recovered. Exercise caution when performing this operation.

8.3 Command Approval Ticket

You can enable dynamic authorization of operations on Linux server. This enhances the restriction of critical operations.

During O&M on Linux hosts, if an operation command triggers the command rules for dynamical approval, the system automatically intercepts the operation command and generates a command approval ticket. The command approval ticket is sent to the administrator. After it is approved by the administrator, you obtain the permission to run the operation command on the Linux host.

Figure 8-1 Example of command interception



```
Last login: Wed Mar 28 10:04:27 2018 from 192.168.1.66
hello, world!
[root@yabvpn ~]# 11
Command "11" is rejected. Please submit CommandControl authorization ticket
[root@yabvpn ~]# █
```

This topic describes how to manage command approval tickets.

Constraints

- A bastion host can intercept sensitive operation commands and generate tickets only for Linux hosts using the SSH or Telnet protocol.
- A command approval ticket cannot be manually created. It is automatically generated when a user attempts to run a command which triggers a command rule.

Prerequisites

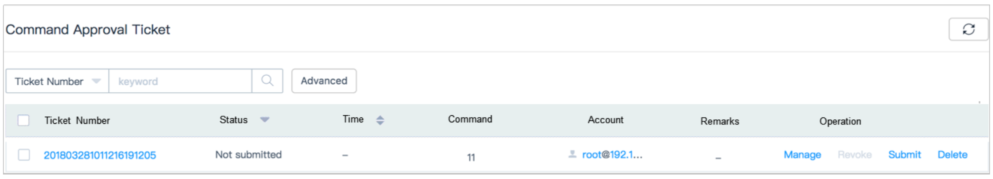
- You have the management permissions for the **Command Approval Ticket** module.
- Command interception has been triggered, and a command approval ticket has been generated.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Tickets** > **Command Approval Ticket**.

Figure 8-2 Command Approval Ticket



Command Approval Ticket

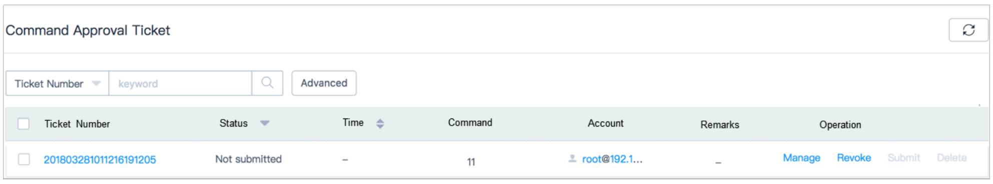
□	Ticket Number	Status	Time	Command	Account	Remarks	Operation
□	201803281011216191205	Not submitted	–	11	root@192.1...	–	Manage Revoke Submit Delete

Step 3 Submit a ticket.

Command approval tickets can be submitted automatically or manually. For details, see **Configuring Basic Ticket Settings**.

- If the automatic submission mode is selected, the system automatically submits the ticket to the administrator for approval.
- If the manual submission mode is selected, click **submit** to send it to the administrator for approval in the **Operation** column on the **Command Approval Ticket** list page.
- If the ticket is rejected by the administrator, you can modify the ticket information and submit it again.

Figure 8-3 Submitted ticket



Command Approval Ticket

□	Ticket Number	Status	Time	Command	Account	Remarks	Operation
□	201803281011216191205	Not submitted	–	11	root@192.1...	–	Manage Revoke Submit Delete

Step 4 Withdraw a ticket.

Click **Withdraw** in the **Operation** column of the ticket you want to cancel. The ticket status then changes to **Revoked**.

Step 5 Modify ticket information.

- Click **Manage** to go to the details page.
- Click **Edit** on the details page and modify the authorized operation duration.

NOTE

For tickets in the **approving** status, you can only view the details but cannot modify the content. Only the ticket in the **Revoked** or **Not submitted** state can be modified.

Step 6 Delete a ticket.

- To delete one ticket, in the row of the ticket you want to delete, click **Delete** in the **Operation** column.
- To delete multiple tickets, select the ones you want to delete and click **Delete** at the bottom of the ticket list to delete all selected tickets together.

⚠ CAUTION

Deleted tickets cannot be recovered. Exercise caution when performing this operation.

----End

Follow-up Operations

- After a ticket is submitted, the administrator will receive a notification in the message center. They can view the ticket details. The ticket will also display in the ticket approval page. The administrator can choose to approve or reject the ticket.
- After the administrator approves the ticket, you then obtain the command operation permissions within the authorization scope and period.
- After the permission in the ticket is revoked by the administrator, the operation commands will be intercepted again.

8.4 Ticket Approval

After a ticket is created by a system user or generated by the system, the ticket goes to the specified approvers. The approvers receive a ticket approval notification in the message center. They can view tickets to be approved on the **Ticket approval** page.

This topic describes how to manage tickets submitted by others. You can view ticket details as well as approve, reject, and revoke a ticket approval.

Prerequisites

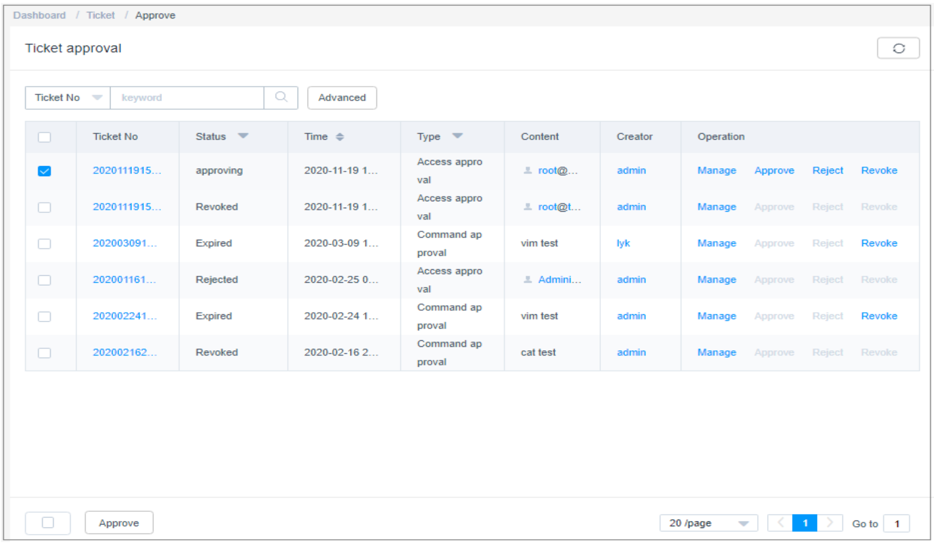
You have the management permissions for the **Ticket approval** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Ticket** > **Ticket approval**.

Figure 8-4 Ticket approval

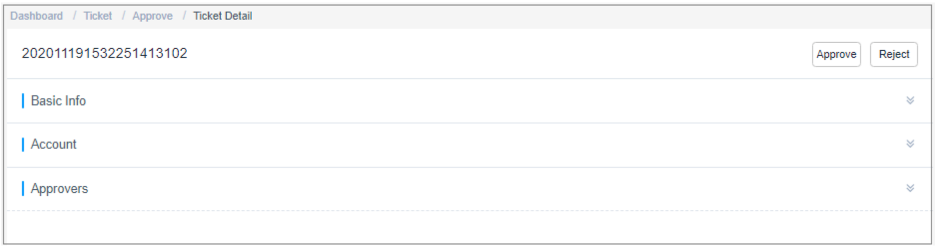


☐	Ticket No	Status	Time	Type	Content	Creator	Operation
☑	2020111915...	approving	2020-11-19 1...	Access approval	root@...	admin	Manage Approve Reject Revoke
☐	2020111915...	Revoked	2020-11-19 1...	Access approval	root@t...	admin	Manage Approve Reject Revoke
☐	202003091...	Expired	2020-03-09 1...	Command approval	vim test	lyk	Manage Approve Reject Revoke
☐	202001161...	Rejected	2020-02-25 0...	Access approval	Admini...	admin	Manage Approve Reject Revoke
☐	202002241...	Expired	2020-02-24 1...	Command approval	vim test	admin	Manage Approve Reject Revoke
☐	202002162...	Revoked	2020-02-16 2...	Command approval	cat test	admin	Manage Approve Reject Revoke

Step 3 Views details about tickets.

In the row of a ticket you want to manage, click **Manage** in the **Operation** column. On the displayed ticket details page, view the basic information, account list, and approver list of the ticket.

Figure 8-5 Ticket details



202011191532251413102

Basic Info

Account

Approvers

Step 4 Approve the ticket.

- To approve one ticket, click **Approve** in the **Operation** column of the corresponding row.
- To approve multiple tickets at a time, select the ones you want and click **Approve** in the lower left corner of the list to approve them together.

Step 5 Reject a ticket.

In the row of the ticket you want to reject, click **Reject** in the **Operation** column.

Step 6 Cancel a ticket.

In the row of the ticket you want to cancel the authorization, click **Cancel** in the **Operation** column.

----End

8.5 Ticket Application Examples

Case 1: Creating a Classification Approval Ticket to Control Resource Requests Based on User Departments

Prerequisites

- You have configured required parameters, including departments, users, roles, and resources. For more details, see **Department**, **User**, and **Resource**.
- The ticket approval process is configured as shown in **Table 8-4**. For more details about ticket approval process, see **Configuring the Ticket Approval Process**.

Table 8-4 Parameters for configuring a ticket approval process

Parameter	Value
Approval process type	Classification
Approval form	Multiplayer
Approval node	User department – Department Manager
Approval series	3

Approval Process

A user submits a ticket to apply for access permissions for resources based on the department that the user belongs to.

Both user A and user B (lower-level administrators) have the approval right. If either one of them approves, the ticket is approved. If either one of them rejects, the ticket is rejected. After one of the lower-level administrators approves the ticket, the workflow goes to the next stage for user C (middle-level administrator) to review. The rest can be deduced by analogy. After user D (higher-level administrator) approves the ticket, the user obtains the requested permissions. If the ticket is rejected at any stage during the approval, it fails to be approved and the user cannot obtain the permissions.

NOTE

An account with permissions of the admin administrator can approve or reject any ticket on any node, and the result is the final result.

Case 2: Creating a Classification Approval Ticket to Control Resource Requests Based on Resource Departments

Prerequisites

- You have configured required parameters, including departments, users, roles, and resources. For more details, see **Department**, **User**, and **Resource**.

- The ticket approval process is configured as shown in **Table 8-5**. For more details about ticket approval process, see **Configuring the Ticket Approval Process**.

Table 8-5 Parameters for configuring a ticket approval process

Parameter	Value
Approval process type	Classification
Approval form	Multiplayer
Approval node	User department – Department Manager
Approval series	3

Approval Process

A user submits a ticket to apply for access permissions for resources based on the department that the resource belongs to.

If user D (lower-level administrator) approves the ticket, the workflow goes to the next stage for user E (middle-level administrator) to review. If user D rejects the ticket, the ticket is rejected. The rest can be deduced by analogy. After user F (higher-level administrator) approves the ticket, the user obtains the requested permissions. If the ticket is rejected at any stage during the approval, it fails to be approved and the user cannot obtain the permissions.

NOTE

An account with permissions of the admin administrator can approve or reject any ticket on any node, and the result is the final result.

Case 3: Creating a Ticket with Fixed Approval Process and Countersign Form

Prerequisites

- You have configured required parameters, including departments, users, roles, and resources. For more details, see **Department**, **User**, and **Resource**.
- The ticket approval process is configured as shown in **Table 8-6**. For more details about ticket approval process, see **Configuring the Ticket Approval Process**.

Table 8-6 Parameters for configuring a ticket approval process

Parameter	Value
Approval process type	Regular
Approval form	Countersign
Approval node	3

Approval Process

A user submits a ticket to apply for access to resources of a department that the user does not belong to.

Both user B and user C have the approval right. If both of them approve, the ticket is approved. If either one of them rejects, the ticket is rejected. After the engineering department administrators approve the ticket, the workflow goes to the next stage for user D (finance department administrator) to review. The rest can be deduced by analogy. After user E (finance department administrator) approves the ticket, the user obtains the requested permissions. If the ticket is rejected at any stage during the approval, it fails to be approved and the user cannot obtain the permissions.

NOTE

An account with permissions of the admin administrator can approve or reject any ticket on any node, and the result is the final result.

9 Operation

9.1 Host Operation

9.1.1 Viewing the Host Resource List and Setting Resource Labels

After obtaining the access permissions for host resources, you can view authorized host resources in the host operation list and set labels for host resources.

This topic describes how to view authorized resources and set resource labels.

Constraints

- Labels cannot be shared with others. You can define your own resource labels for your exclusive use.
- Downloading login configuration is supported by only resources managed over SSH.

Prerequisites

- You have the management permissions for the **Host Operations** module.
- You have obtained the access permissions for the resources.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Operation** > **Host Operations** to go to the **Host Operations** page.

Step 3 Query host resources.

Quick search: Enter a keyword in the search box to quickly query host resources by auto recognition, host name, and host IP address.

Step 4 Add a label to an application resource.

1. Select an application resource you want and click ✎ in the **Label** column.

2. Enter a label type and press **Enter** or select an existing label type.
3. Click **OK**. You can then view the added label on the **Host Operations** page.

Step 5 Add a label for multiple application resources at a time.

1. Select multiple resources and click **Add Label** in the lower left corner of the list.
2. Enter a label type and press **Enter** or select an existing label type.
3. Click **OK**. You can then view the added label on the **Host Operations** page.

Step 6 Delete an application resource label.

1. Select multiple resources and click **Delete Label** in the lower left corner of the list.
2. In the displayed dialog box, confirm the deletion and click **OK**.

----End

9.1.2 Logging In to Managed Resources Using a Web Browser for O&M

After you log in to a host resource using a web browser, the cooperation, file management, file transfer, and command preset functions are available for you. A bastion host can log all activities performed on a host resource. The logs can be used for audits.

- Cooperation: This function allows the session initiator to invite other system users to participate the current session by sharing the session link with them, implementing O&M collaboration.
- File management: If you participate in a session and have operation permissions for this function, on the pane on the right of the session, you can manage files or folders on managed hosts and net disks on them. You can:
  - Create new folders.
  - Change the name of a file or folder.
  - Delete files or folders in batches.
- File transfer: This function allows session participants to download or upload files or folders on the host or host net disk after they obtain the operation permissions. They can:
  - Upload and download files.
  - Upload folders.
  - Upload multiple files on a local server or net disk to a host or download multiple files from a host to a local server or net disk, if **Host Files** is selected as the destination address.
  - Upload multiple files or a folder to a host net disk or download multiple files from a host net disk to a local host, if **Netdisk** is selected as the destination address.

This topic describes how to log in to a host using a web browser and how to perform operations in the session window of the hosts using character or image protocols.

Constraints

- Only hosts using character protocols (SSH and Telnet) or image protocols (RDP and VNC) can be logged in using a web browser.
- The file transfer and management functions are unavailable for hosts using the Telnet protocol.
- Although using a web browser for O&M allows you to copy and paste a large number of characters without garbled characters, a maximum of 80,000 characters can be copied from the local to the remote, and a maximum of 1000,000 of bytes can be copied from the remote to the local.
- If you log in to a bastion host as a non-admin user and want to manage Windows host resources, deselect the admin console. To do so, go to the **Operation** > **Host Operations** page, click **Web OPS Settings** in the upper right corner, then deselect **admin console**.
- File management

  Files and folders cannot be edited in batches.
- File Transmission
  - By default, the system supports the upload of a single file with a maximum size of 100 GB. However, the size of a single file to be uploaded is limited by the **Personal Netdisk** space and browser type.

    NOTE

    If the disk space is insufficient, the upload will fail. In this case, you need to clear the disk or expand the disk capacity.
  - Folders cannot be downloaded.
  - For the hosts using the RDP protocol, only **Netdisk** can be select as the destination address.

Prerequisites

- You have the management permissions for the **Host Operations** module.
- You have obtained the access permissions for the resources.
- The network connection between the managed host and the system is normal, and the account username and password for logging in to the managed host are correct.

Procedure

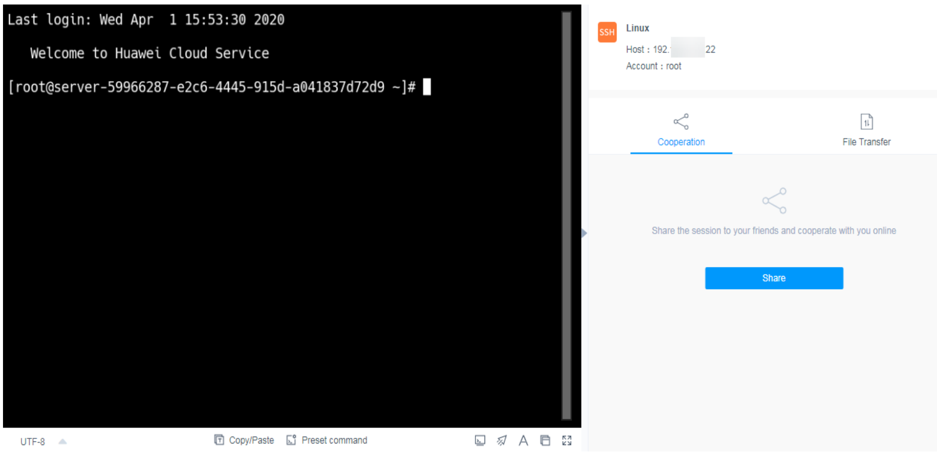
Step 1 Log in to your bastion host.

Step 2 Choose **Operation** > **Host Operations** to go to the **Host Operations** page.

Step 3 Select the host you want and click **Login** in the **Operation** column to open the session.

- **Session Window of Hosts Using the RDP or VNC Protocol**
- **Session Window of Hosts Using the SSH or Telnet Protocol**

Figure 9-1 Session window of hosts using the SSH protocol



```
Last login: Wed Apr  1 15:53:30 2020

   Welcome to Huawei Cloud Service

[root@server-59966287-e2c6-4445-915d-a041837d72d9 ~]#
```

Linux

Host : 192.[redacted]22

Account : root

Share the session to your friends and cooperate with you online

Step 4 Invite other system users to participate in the current session. For details, see **Cooperation**.

1. Click **Cooperation**. The collaborative session window is displayed.
2. Click **Share**. Complete the information in the displayed **Invite friends** dialog box.

   NOTE

   – The URL link can be copied and sent to multiple users.

   – Only users with the access permission can access the bastion host. Otherwise, a connection error will be reported, indicating that the connection has been disconnected because the server does not respond for a long time. Check your network settings and try again (Code: T_514).
3. Copy the link and send it to the users whom you want to invite. The users must have the access permission assigned. Once they receive the link, they can log in to the bastion host, open a web browser, and enter the link to open it in the web browser.
4. If you are invited, click **Enter** to join the session.

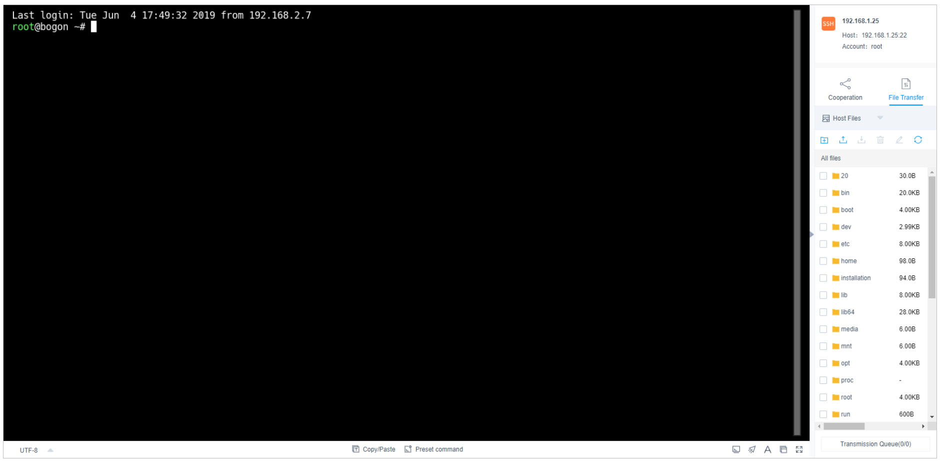
Table 9-1 Parameters for session operation

Parameter	Description
Apply for control	The invited user can apply for control from the invitation sender. Once approved, the invited user can control the current session.
Exit session	Exit the current session.

Step 5 Upload files to or download files from the host or host net disk. For details, see **File Transfer**.

1. Click **File Transfer**. The **File Transfer** window is displayed.

Figure 9-2 File Transmission



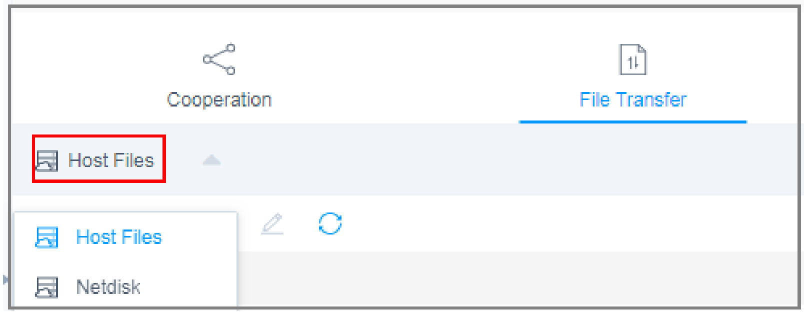
```
Last login: Tue Jun  4 17:49:32 2019 from 192.168.2.7
root@bogon ~# 
```

192.168.1.25
Host: 192.168.1.25:22
Account: root

20	30.0B
bin	20.0KB
boot	4.00KB
dev	2.99KB
etc	8.00KB
home	98.0B
installation	94.0B
lib	8.00KB
lib64	28.0KB
media	6.00B
mnt	6.00B
opt	4.00KB
proc	-
root	4.00KB
run	600B

2. **Host Files** is selected by default. You can click **Host Files** to switch the destination address to **Netdisk**.

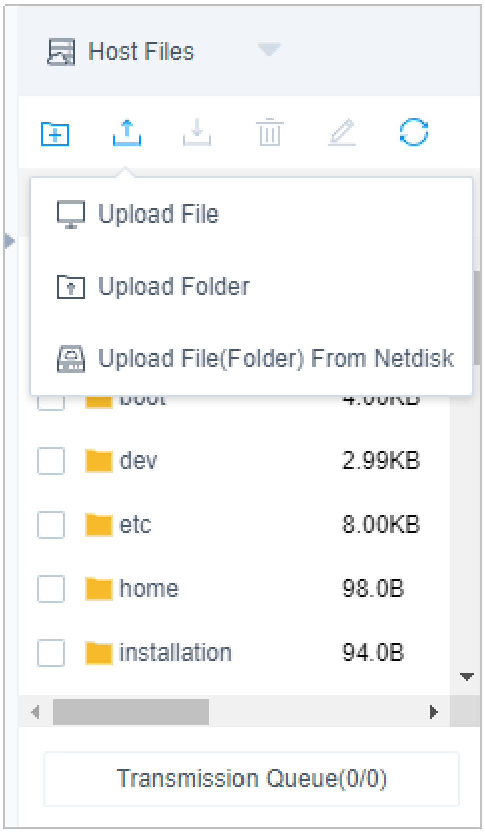
Figure 9-3 Switchover of destination address



3. Click ⤒ to upload a file.

4. Select a file and click ⤓ to download a file.

Figure 9-4 Uploading files



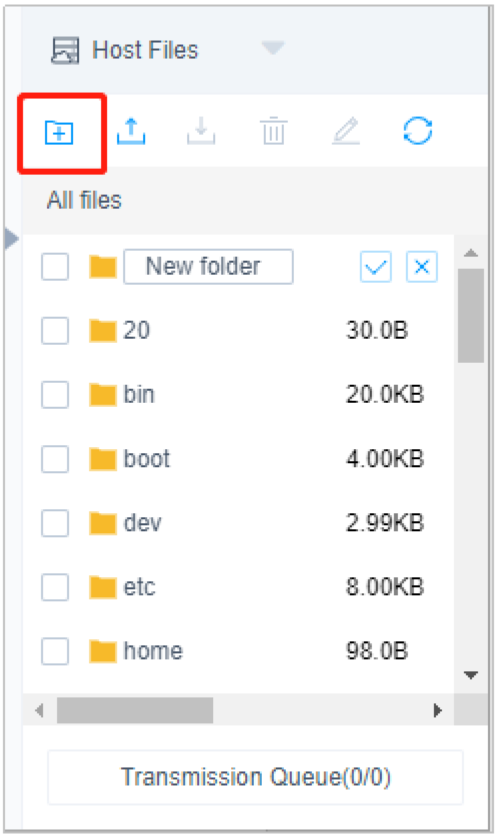
NOTE

- **Netdisk** is dedicated for your exclusive use. It cannot be accessed by other users. You can transfer files from **Netdisk** to multiple hosts without worries of data leakage.
- The default file storage path of Windows servers is drive G, and that of Linux servers is the root directory.
- To upload or download files on a Windows server, open the disk directory of the server and copy and paste the file to drive **G** of the Netdisk.

Step 6 In the file management area, manage files or folders on the host or host net disk.

1. Click **File Transfer**. The **File Transfer** window is displayed.
2. Click ⊞ to create a folder.

Figure 9-5 New folder



3. Select one or more files or folders and click 🗑 to delete them.

4. Select a file or folder and click ✎ to edit its name.

5. Click ⟳ to refresh all file directories.

----End

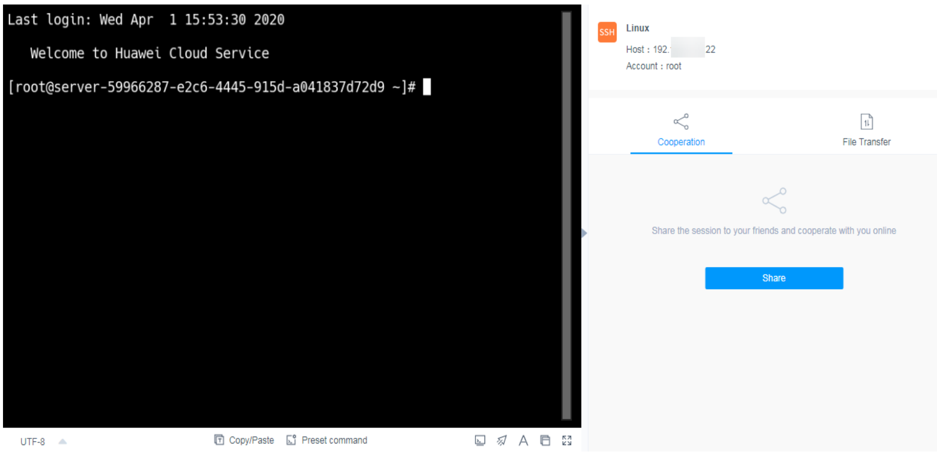
Session Window of Hosts Using the SSH or Telnet Protocol

Table 9-2 Linux host operations

Parameter	Description
Encode	The character protocol supports multiple encoding formats.
Copy/Paste	Select the characters, press **Ctrl**+**C** to copy it, and press **Ctrl**+**V** to paste it.
Preset command	You can preset commands that are long and frequently used.
Terminal Type	The character protocol supports terminal type switching, including Linux and Xterm.

Parameter	Description
Mass sending	When the group sending function is enabled, you can run commands in multiple sessions at the same time.
Font size	There are three types of font sizes: large, medium, and small.
Copy window	You can copy the current session window.
Full screen	Displays the window in full screen.

Figure 9-6 Session window of hosts using the SSH protocol



```
Last login: Wed Apr  1 15:53:30 2020

   Welcome to Huawei Cloud Service

[root@server-59966287-e2c6-4445-915d-a041837d72d9 ~]#
```

Linux
Host : 192.[redacted]22
Account : root

Share the session to your friends and cooperate with you online

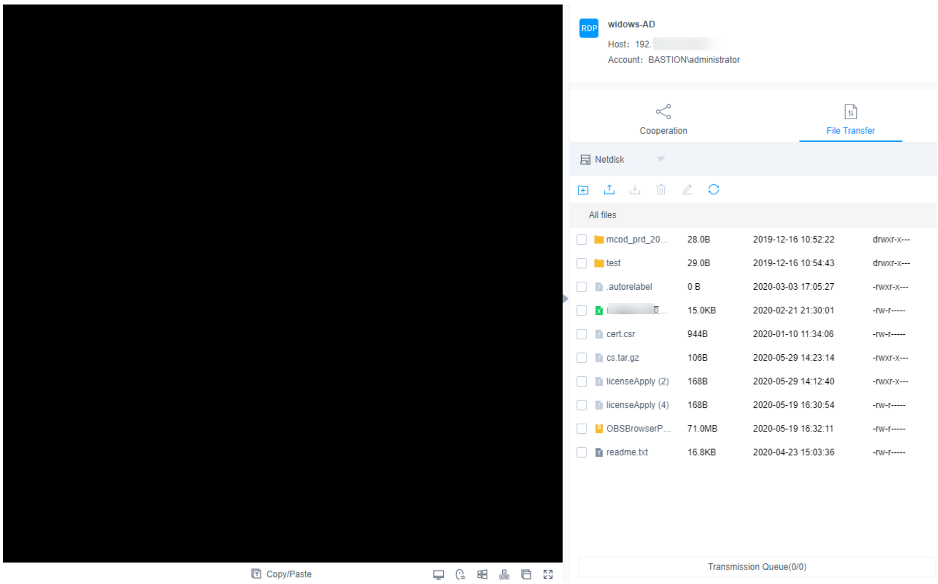
Session Window of Hosts Using the RDP or VNC Protocol

Table 9-3 Windows host operations

Parameter	Description
Copy/ Paste	Remote text: Select the character you want, press **Ctrl+C** twice to copy the character, and press **Ctrl+V** to paste the character. Remote machine files: Select a text or image, press **Ctrl+B** to copy it, and press **Ctrl+G** to paste it. **NOTE** Although using a web browser for O&M allows you to copy and paste a large number of characters without garbled characters, a maximum of 80,000 characters can be copied from the local to the remote, and a maximum of 1000,000 of bytes can be copied from the remote to the local.
Resolution	You can switch the resolution of the current operation interface. During the switching, a new connection is created.

Parameter	Description
Switch to remote mouse	You can switch over between the local mouse and remote mouse.
Windows	This Windows icon can be used for easy access to Windows system functions.
Ctrl+Alt+Delete	**Ctrl+Alt+Delete**
Copy window	You can copy the current session window.
Full screen	Displays the window in full screen.

Figure 9-7 Session window of hosts using the RDP protocol



RDP widows-AD
Host：192.[redacted]
Account：BASTION\administrator

All files			
□ mcod_prd_20...	28.0B	2019-12-16 10:52:22	drwxr-x---
□ test	29.0B	2019-12-16 10:54:43	drwxr-x---
□ .autorelabel	0 B	2020-03-03 17:05:27	-rwxr-x---
□ I[redacted]页...	15.0KB	2020-02-21 21:30:01	-rw-r-----
□ cert.csr	944B	2020-01-10 11:34:06	-rw-r-----
□ cs.tar.gz	106B	2020-05-29 14:23:14	-rwxr-x---
□ licenseApply (2)	168B	2020-05-29 14:12:40	-rwxr-x---
□ licenseApply (4)	168B	2020-05-19 16:30:54	-rw-r-----
□ OBSBrowserP...	71.0MB	2020-05-19 16:32:11	-rw-r-----
□ readme.txt	16.8KB	2020-04-23 15:03:36	-rw-r-----

Transmission Queue(0/0)

9.1.3 Logging In to Resources Using an SSH Client for O&M

You can use an SSH client to log in to managed resources via a bastion host. You do not have to change your habits of using an SSH client. Through SSH client, the command rules and operation audit function are still available.

This topic uses Xshell as an example to describe how to use an SSH client to log in to a resource for O&M and how to download the configuration file of the resource.

Constraints

- Logging using an SSH client is used only for hosts using the SSH, Telnet, or Rlogin protocol. For hosts using the Rlogin protocol, only an SSH client can be used for logins.
- Supported SSH clients include SecureCRT 8.0 or later, Xshell 5 or later, PuTTY, and MAC Terminal 2.0 or later.
- The following table lists the servers supported by different algorithm types in different scenarios.

Table 9-4 Servers supporting SSH O&M

Algorithm Type	HTML5 O&M	SSH Client
Key exchange	● diffie-hellman-group-exchange-sha256 ● diffie-hellman-group-exchange-sha1 ● diffie-hellman-group14-sha1 ● diffie-hellman-group1-sha1 ● ecdh-sha2-nistp256 ● ecdh-sha2-nistp384 ● ecdh-sha2-nistp521 ● curve25519-sha256 ● curve25519-sha256@libssh.org ● diffie-hellman-group14-sha256	● diffie-hellman-group-exchange-sha256 ● diffie-hellman-group-exchange-sha1 ● diffie-hellman-group14-sha1 ● diffie-hellman-group1-sha1 ● ecdh-sha2-nistp521 ● ecdh-sha2-nistp384 ● ecdh-sha2-nistp256
Encryption	● aes128-ctr ● aes192-ctr ● aes256-ctr ● aes128-cbc ● aes192-cbc ● aes256-cbc ● 3des-cbc ● blowfish-cbc ● arcfour128 ● arcfour ● cast128-cbc ● 3des-cbc ● rijndael-cbc@lysator.liu.se	● aes128-ctr ● aes192-ctr ● aes256-ctr ● aes128-cbc ● aes192-cbc ● aes256-cbc ● 3des-cbc ● blowfish-cbc ● arcfour128 ● arcfour256

Algorithm Type	HTML5 O&M	SSH Client
HMAC	● hmac-md5 ● hmac-md5-96 ● hmac-sha1 ● hmac-sha1-96 ● hmac-sha2-256 ● hmac-sha2-512 ● hmac-ripemd160 ● hmac-ripemd160@openssh.com	● hmac-md5 ● hmac-md5-96 ● hmac-sha1 ● hmac-sha1-96 ● hmac-sha2-256 ● hmac-sha2-512
Host Key	● ssh-rsa ● ssh-dss ● ecdsa-sha2-nistp256 ● ecdsa-sha2-nistp384 ● ecdsa-sha2-nistp521 ● ssh-ed25519	● ssh-rsa ● ssh-dss ● rsa-sha2-256 ● rsa-sha2-512 ● ecdsa-sha2-nistp256 ● ecdsa-sha2-nistp384 ● ecdsa-sha2-nistp521

Prerequisites

- You have the management permissions for the **Host Operations** module.
- You have obtained the access permissions for the resources.
- You have installed the client tool.
- The network connection between the managed host and the system is normal, and the account username and password for logging in to the managed host are correct.

Procedure

Step 1 Start the local client tool Xshell and choose **File** > **New** to create a user session.

Step 2 Configure session connections.

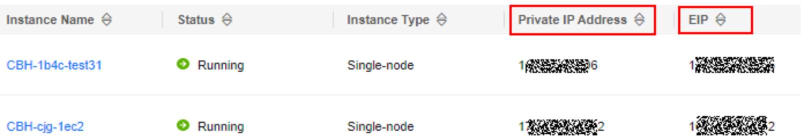
- Method 1
  a. Set **Protocol Type** to **SSH**, enter the elastic IP address of your bastion host, set **Port** to **2222**, and click **OK**.
  b. Enter the username of your bastion host and click **Connect**.
- Method 2:

  In the newly opened blank session window, run a command in the following format: ***Protocol type User login name@System login IP address Port number***, for example, ssh admin@10.10.10.10 2222.
- Method 3

In the live session window of a Linux host, run a command in the following format: ***Protocol type User login name@System login IP address*-p *Port number***, for example, ssh admin@10.10.10.10 -p 2222.

NOTE

system login IP address indicates the private IP address or EIP of your bastion host. Make sure the network connection between the local PC and the IP address is normal.



Instance Name	Status	Instance Type	Private IP Address	EIP
CBH-1b4c-test31	Running	Single-node	[redacted]	[redacted]
CBH-cjg-1ec2	Running	Single-node	[redacted]	[redacted]

Step 3 Verify user identity.

- Select **Password**, enter your password, and click **OK**.
- Select **Public Key**, select a user key from the **Browse** drop-down list, enter the password, and click **OK**.

  After the authentication is successful, the user can use the SSH client to log in to the bastion host without having to enter a password.

Step 4 Log in to your bastion host.

If an SSH client is used, password, SMS message, mobile token, and OTP can be used for login identity authentication. To use mobile SMS message, mobile OTP, and OTP authentication methods, configure multifactor verification. For details, see **Configuring User Login Restrictions**.

- Mobile SMS: After logging in to the system using the local password, select **Mobile SMS** for **Multifactor Verification**, and enter the SMS verification code.
- Mobile OTP: After logging in to the system using the local password, select **Mobile OTP** and enter the dynamic password of the mobile phone token.
- One-Time password: After logging in to the bastion host using the local password, select **OTP** and enter the dynamic token verification code.

Step 5 Import accounts of a managed host.

Decompress the configuration file package, open the **readme.txt** file, and import the resource account. For details about how to download the package, see **Downloading Host Configuration File**.

Step 6 Log in to the managed host using an account.

Select the account to be used for logging, enter the password of the system user, and log in to the host for O&M.

----End

Downloading Host Configuration File

To import host resources in batches using the SSH client, download the configuration files of the hosts to be imported.

Step 1 Log in to your bastion host using a web browser.

Step 2 Choose **Operation** > **Host Operations** to go to the **Host Operations** page.

Step 3 Click **Export Host Configuration**.

Step 4 Select the configuration file of the client and click **OK** to download the configuration file.

----End

9.1.4 Logging In to File Transfer Resources Using an FTP or SFTP Client

You can use file transfer clients to transfer files between authorized managed hosts. This means you can transfer files the way you are used to. A bastion host can log all activities performed on a host resource. The logs can be used for audits.

This topic describes how to obtain client login information and log in to resources that use a file transfer protocol.

Constraints

Only hosts with **Protocol** set to **FTP**, **SFTP**, or **SCP** can be logged in to using a web browser. Client tools must meet the requirements in the following table.

Table 9-5 Tools supported

Host Protocol	Client Tool Required
SFTP	Xftp 6 or later, WinSCP 5.14.4 or later, and FlashFXP 5.4 or later
FTP Protocol	Xftp 6 or later, WinSCP 5.14.4 or later, FlashFXP 5.4 or later, and FileZilla 3.46.3 or later

Table 9-6 Supported clients

Algorithm Type	SSH Client
Key exchange	● diffie-hellman-group-exchange-sha256 ● diffie-hellman-group-exchange-sha1 ● diffie-hellman-group14-sha1 ● diffie-hellman-group1-sha1 ● ecdh-sha2-nistp521 ● ecdh-sha2-nistp384 ● ecdh-sha2-nistp256

Algorithm Type	SSH Client
Encryption	● aes128-ctr ● aes192-ctr ● aes256-ctr ● aes128-cbc ● aes192-cbc ● aes256-cbc ● 3des-cbc ● blowfish-cbc ● arcfour128 ● arcfour256
HMAC	● hmac-md5 ● hmac-md5-96 ● hmac-sha1 ● hmac-sha1-96 ● hmac-sha2-256 ● hmac-sha2-512
Host Key	● ssh-rsa ● ssh-dss ● rsa-sha2-256 ● rsa-sha2-512 ● ecdsa-sha2-nistp256 ● ecdsa-sha2-nistp384 ● ecdsa-sha2-nistp521

Prerequisites

- You have the management permissions for the **Host Operations** module.
- You have obtained the access permissions for the resources.
- You have installed the client tool.
- The network connection between the managed host and the system is normal, and the account username and password for logging in to the managed host are correct.
- You have enabled FTP and opened ports 2222 (for SFTP) and 2121 (for FTP). For details, see **Configuring the Operation Ports**.

Procedure

Step 1 Obtain the login information.

1. Log in to your bastion host.

2. Choose **Operation** > **Host Operations** to go to the **Host Operations** page.
3. Select an FTP or SFTP host resource, and click **Login**.

Step 2 Log in to the host using a client tool.

1. Start the local FTP or SFTP client tool.
2. Enter the host address, port number, user name, and login password.

NOTE

You can use APIs to log in to host resources using the FTP or SFTP protocol.

Table 9-7 Parameter description

Parameter	Description
Host Addr	IP address for logging in to the bastion host.
Port	Port number. The default port number is 2222.
UserName	Username in the configuration information in the format of login name@resource account name@host address, for example, admin@root@192.168.1.1.
Password	Password for the user to log in to the bastion host.

----End

9.1.5 Logging In to and Maintaining Database Resources Using an SSO Client

You can use single sign-on (SSO) tools to invoke the database client tool for database resource O&M and operation audit. Before your start, install the SSO and database client tools and then configure the path of the database client tool.

This topic describes how to configure the SSO client and how to use the SSO tool to log in to database resources.

NOTE

There are four options for the single sign-on (SSO) tool:

- Mysql cmd
- MySQL Administrator
- Navicat
- DBeaver (supported by bastion host V3.3.48.0 and later versions)

Constraints

- The database operation audit is available only in professional editions.
- Only MySQL, SQL Server, Oracle, DB2, PostgreSQL, and GaussDB databases can be managed.

NOTE

A bastion host cannot verify the database with SSL enabled. When connecting to GaussDB databases, you need to disable SSL (**sslmode**) on DBeaver.

- The client tool can be invoked only through SsoDBSettings.
- Only some database clients can be invoked through an SSO tool. For details, see the following table.

Table 9-8 Supported database protocols, versions, and clients

Database Type	Version	Supported Client
MySQL	MySQL 5.5, 5.6, 5.7, and 8.0	Navicat 11, 12, 15, and 16 MySQL Administrator 1.2.17 MySQL CMD
Microsoft SQL Server	2014, 2016, 2017, 2019, and 2022	Navicat 11, 12, 15, and 16 SSMS 17.6
Oracle	10g, 11g, 12c, 19c, and 21c	Toad for Oracle 11.0, 12.1, 12.8, and 13.2 Navicat 11, 12, 15, and 16 PL/SQL Developer 11.0.5.1790
DB2	DB2 Express-C	DB2 CMD command line 11.1.0
PostgreSQL	11, 12, 13, 14, and 15	DBeaver 22 and 23
GaussDB	2 and 3	DBeaver 22 and 23

NOTE

- You need to download the database versions supported.
- If you need to use an SSO tool to perform O&M on PostgreSQL and GaussDB databases, add the sslmode attribute to the connection attributes in **Database > Driver Manager** and save the value as **disable**.
- The SsoTool.msi remote tool can be installed only in the default path **C:\sso\SsoTool**. If you install it in other paths, the tool may fail to be started.

Prerequisites

- You have the management permissions for the **Host Operation** module.
- You have obtained the access permissions for the resources.
- You have installed the client tool.
- The network connection between the managed host and the system is normal, and the account username and password for logging in to the managed host are correct.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Operation** > **Host Operations** to go to the **Host Operations** page.

Step 3 Select a host resource of the database protocol type and click **Login**.

NOTE

- When you first time log in to the database, you will see the SsoDBSettings download window.
- The download tool varies depending on the bastion host version you are using.

  For example, if you are using version 3.3.44.0, SSO tool Windows and UOS (Arm) are provided. You can select either of them from the drop-down list.

Step 4 Select the client tool that has been installed and click **OK**.

The local database client is automatically invoked.

Step 5 Log in to the database for operations.

----End

Configuring the SSO Client

The following uses the **Navicat** client as an example to describe how to configure the client path.

Step 1 Start local SSO tool SsoDBSettings.

Step 2 Click the path configuration icon next to **Navicat Path**.

Step 3 Find the absolute path where the Navicat client is installed, select the .exe file, and click **Open**.

Step 4 Go to the SsoDBSettings SSO tool configuration page and view the selected Navicat client path.

Step 5 Click **Save** to return to the **Host Operation** page in your bastion host. Then, you can log in to the database.

----End

9.1.6 Logging In to Hosts in Batches for O&M

You can batch log in to host resources through your bastion host for operations, including file transfer, file management, and command presetting. A bastion host can log all activities performed on a host resource. The logs can be used for audits.

This section describes how to log in to hosts in batches using a web browser.

Constraints

- Batch login is unavailable for hosts configured with the FTP, SFTP, DB2, MySQL, Oracle, SQL Server, or SCP protocol.
- Manual login and two-person approval accounts cannot be used for batch logging.

- The cooperation session function is unavailable for hosts logged in through batch logging.

Prerequisites

- You have the management permissions for the **Host Operation** module.
- You have obtained the access permissions for the resources.

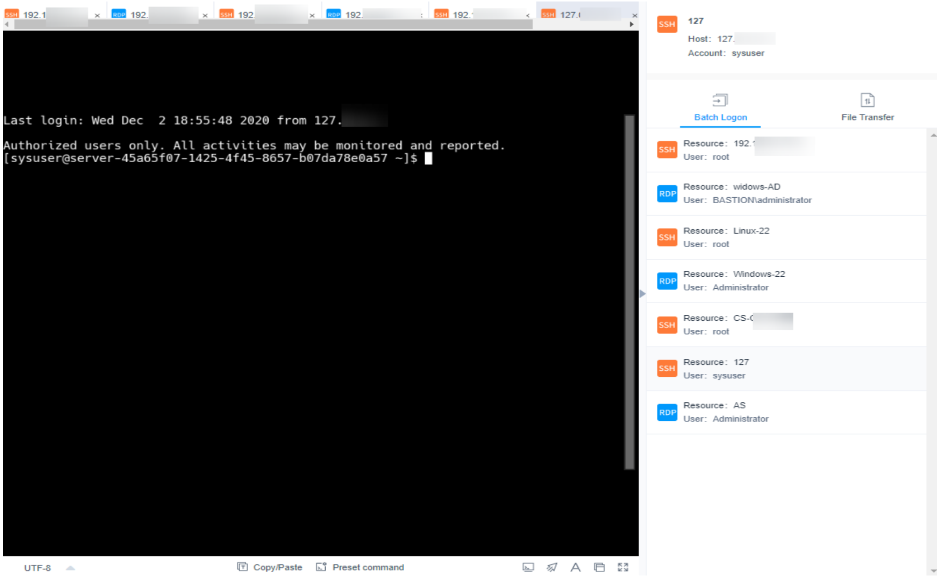
Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Operation** > **Host Operations** to go to the **Host Operations** page.

Step 3 Select multiple resources and click **Batch Logon**.

Figure 9-8 Batch logon session windows



```
Last login: Wed Dec  2 18:55:48 2020 from 127.[redacted]

Authorized users only. All activities may be monitored and reported.
[sysuser@server-45a65f07-1425-4f45-8657-b07da78e0a57 ~]$ 
```

SSH 127
Host: 127.[redacted]
Account: sysuser

SSH Resource: 192.[redacted]
User: root

RDP Resource: widows-AD
User: BASTION\administrator

SSH Resource: Linux-22
User: root

RDP Resource: Windows-22
User: Administrator

SSH Resource: CS-[redacted]
User: root

SSH Resource: 127
User: sysuser

RDP Resource: AS
User: Administrator

Step 4 Switch over session windows.

Click the resource name in the batch logon list to switch to the corresponding session window.

Step 5 For details about the operations in the session window, see the following description.

- **Session Window of Hosts Using the RDP or VNC Protocol**
- **Session Window of Hosts Using the SSH or Telnet Protocol**

Step 6 Upload files to or download files from the host or host net disk. For details, see **File Transfer**.

Step 7 In the file management area, manage files or folders on the host or host net disk. For details, see **Using a Web Browser for Logging In**.

----End

9.1.7 File Transmission

When you manage resources through a web browser, you can upload or download files on the **File Transfer** tab. This feature enables file transfer between a local computer and managed host and between different managed hosts. The CBH system records the entire file transfer process in detail, making it easier to audit file upload and download operations.

Netdisk is a personal net disk in a system, which is preset for each system user. A user can temporarily store files on it for file transfer between managed hosts. The file content in the personal net disk is visible only to users who creates the file.

Netdisk is directly associated with each system user. If a user is deleted, the files on the personal net disk are cleared and the personal net disk space is released.

Constraints

- Currently, when you use a web browser for O&M, files can be uploaded or downloaded only on the hosts using the SSH or RDP protocol.
- During web-based O&M, users cannot upload files to or download files from managed hosts by running the **rz** or **sz** command but only through **File transfer**.

  NOTE

  For Linux hosts, users can transfer files by running commands on the SSH client. For example, users can run the **rz** or **sz** command on the SSH client to upload or download files. However, the CBH system cannot record such file upload and download data, and the purpose of security audit cannot be met.
- Web-based O%M allows you to download one or more files but not folders.
- Resumable download is not supported. Do not stop or pause the file upload or download process.
- For a file larger than 1 GB, you can split the file into several small files and then upload or download them in batches or **use the FTP client to transfer the file**.

  NOTE

  If the disk space is insufficient, the upload will fail. In this case, you need to clear the disk or expand the disk capacity.

Prerequisites

- You have the permissions to upload and download host resource files.
- You have the host operation permissions and can log in to the managed host using a web browser.

Uploading Files to and Downloading Files from a Managed Linux Host

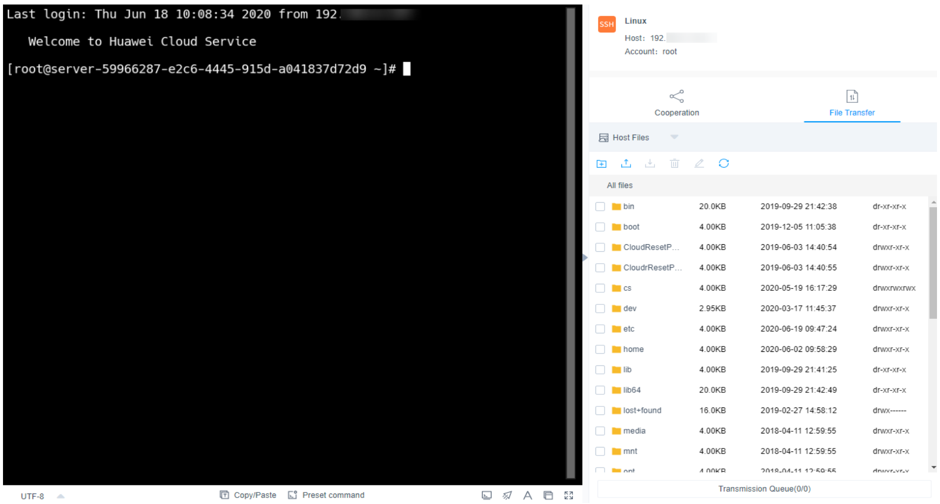
Files can be directly transferred between a Linux host and a local computer without having to use the personal net disk. A personal net disk can be used to transfer files from other managed hosts.

Step 1 Log in to your bastion host.

Step 2 Choose **Operation** > **Host Operations**, select the target Linux host resource, and click **Login** to go to its operation page.

Step 3 On the right of the operation page, choose **File Transfer** to view the Linux host file list.

Figure 9-9 Viewing the file list of a Linux host



```
Last login: Thu Jun 18 10:08:34 2020 from 192.[redacted]

   Welcome to Huawei Cloud Service

[root@server-59966287-e2c6-4445-915d-a041837d72d9 ~]#
```

Linux
Host: 192.[redacted]
Account: root

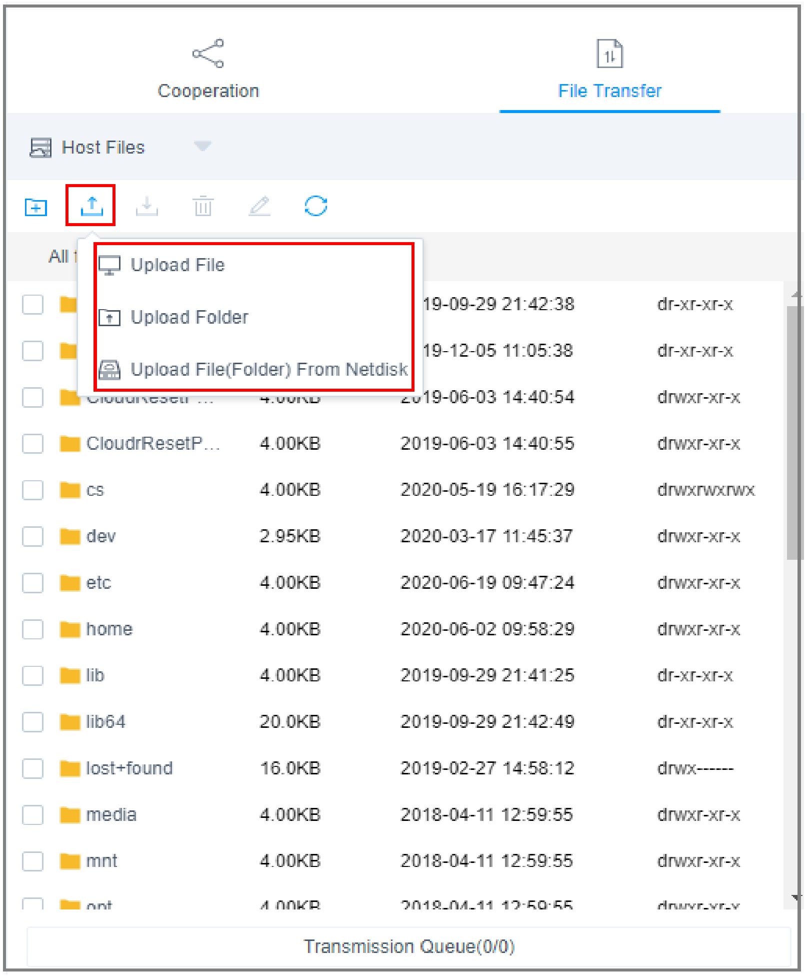
All files

□ bin	20.0KB	2019-09-29 21:42:38	dr-xr-xr-x
□ boot	4.00KB	2019-12-05 11:05:38	dr-xr-xr-x
□ CloudResetP...	4.00KB	2019-06-03 14:40:54	drwxr-xr-x
□ CloudrResetP...	4.00KB	2019-06-03 14:40:55	drwxr-xr-x
□ cs	4.00KB	2020-05-19 16:17:29	drwxrwxrwx
□ dev	2.95KB	2020-03-17 11:45:37	drwxr-xr-x
□ etc	4.00KB	2020-06-19 09:47:24	drwxr-xr-x
□ home	4.00KB	2020-06-02 09:58:29	drwxr-xr-x
□ lib	4.00KB	2019-09-29 21:41:25	dr-xr-xr-x
□ lib64	20.0KB	2019-09-29 21:42:49	dr-xr-xr-x
□ lost+found	16.0KB	2019-02-27 14:58:12	drwx------
□ media	4.00KB	2018-04-11 12:59:55	drwxr-xr-x
□ mnt	4.00KB	2018-04-11 12:59:55	drwxr-xr-x
□ opt	4.00KB	2018-04-11 12:59:55	drwxr-xr-x

Step 4 Upload files to the Linux host.

You can click the upload icon and choose **Upload File**, **Upload Folder**, or **Upload File (Folder) from Netdisk** to upload one or more local files, local folders, or net disk files or folders to the Linux host.

Figure 9-10 Uploading files to a Linux host

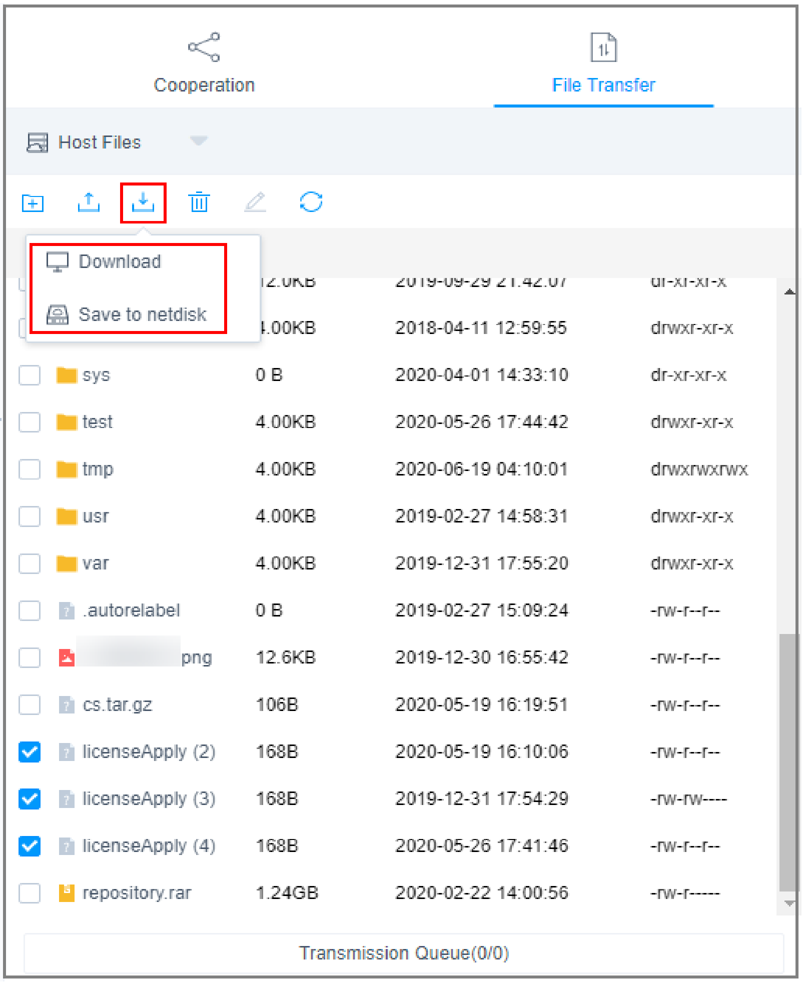


		19-09-29 21:42:38	dr-xr-xr-x
		19-12-05 11:05:38	dr-xr-xr-x
CloudReset ...	4.00KB	2019-06-03 14:40:54	drwxr-xr-x
CloudrResetP...	4.00KB	2019-06-03 14:40:55	drwxr-xr-x
cs	4.00KB	2020-05-19 16:17:29	drwxrwxrwx
dev	2.95KB	2020-03-17 11:45:37	drwxr-xr-x
etc	4.00KB	2020-06-19 09:47:24	drwxr-xr-x
home	4.00KB	2020-06-02 09:58:29	drwxr-xr-x
lib	4.00KB	2019-09-29 21:41:25	dr-xr-xr-x
lib64	20.0KB	2019-09-29 21:42:49	dr-xr-xr-x
lost+found	16.0KB	2019-02-27 14:58:12	drwx------
media	4.00KB	2018-04-11 12:59:55	drwxr-xr-x
mnt	4.00KB	2018-04-11 12:59:55	drwxr-xr-x
opt	4.00KB	2018-04-11 12:59:55	drwxr-xr-x

Step 5 Download files from the Linux host.

1. Select one or more files to be downloaded.
2. Click **Download** or **Save to netdisk** to download selected files to the local computer or the personal net disk, respectively.

Figure 9-11 Downloading files from a Linux host

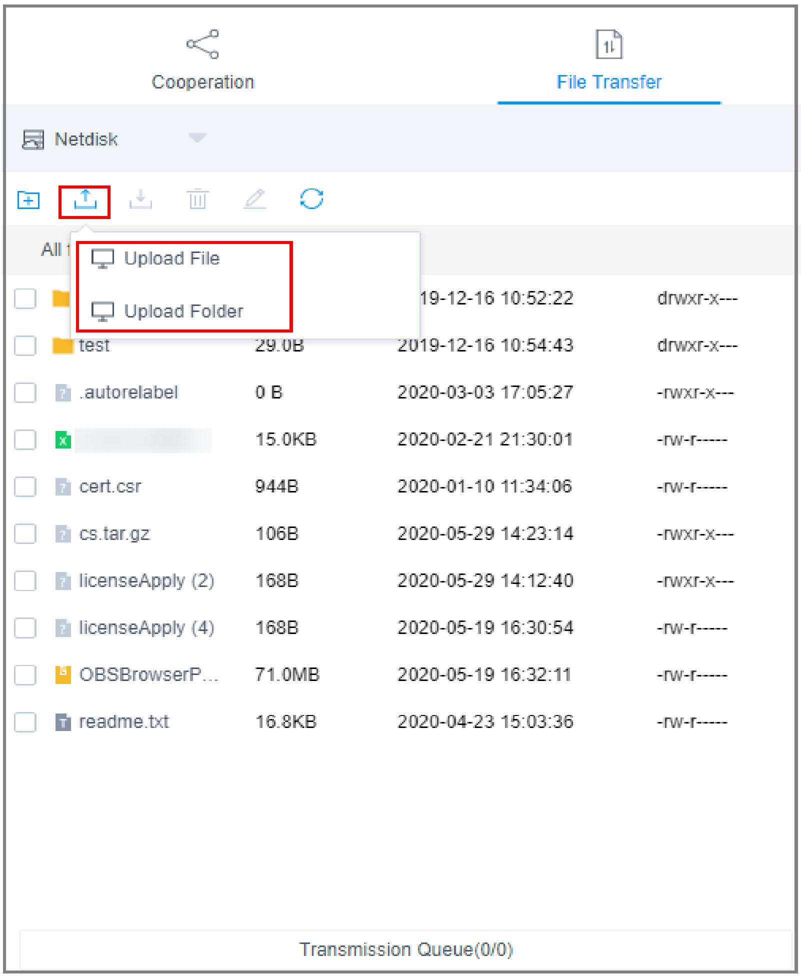


□		12.0KB	2019-09-29 21:42:07	dr-xr-xr-x
□		4.00KB	2018-04-11 12:59:55	drwxr-xr-x
□	sys	0 B	2020-04-01 14:33:10	dr-xr-xr-x
□	test	4.00KB	2020-05-26 17:44:42	drwxr-xr-x
□	tmp	4.00KB	2020-06-19 04:10:01	drwxrwxrwx
□	usr	4.00KB	2019-02-27 14:58:31	drwxr-xr-x
□	var	4.00KB	2019-12-31 17:55:20	drwxr-xr-x
□	.autorelabel	0 B	2019-02-27 15:09:24	-rw-r--r--
□	png	12.6KB	2019-12-30 16:55:42	-rw-r--r--
□	cs.tar.gz	106B	2020-05-19 16:19:51	-rw-r--r--
☑	licenseApply (2)	168B	2020-05-19 16:10:06	-rw-r--r--
☑	licenseApply (3)	168B	2019-12-31 17:54:29	-rw-rw----
☑	licenseApply (4)	168B	2020-05-26 17:41:46	-rw-r--r--
□	repository.rar	1.24GB	2020-02-22 14:00:56	-rw-r-----

Step 6 Upload files to the personal net disk

1. Click **Host File** and select **Netdisk** to switch to the personal net disk file list.
2. Click **Upload File** or **Upload Folder** to upload one or more local files or folders.

Figure 9-12 Uploading files to the personal net disk

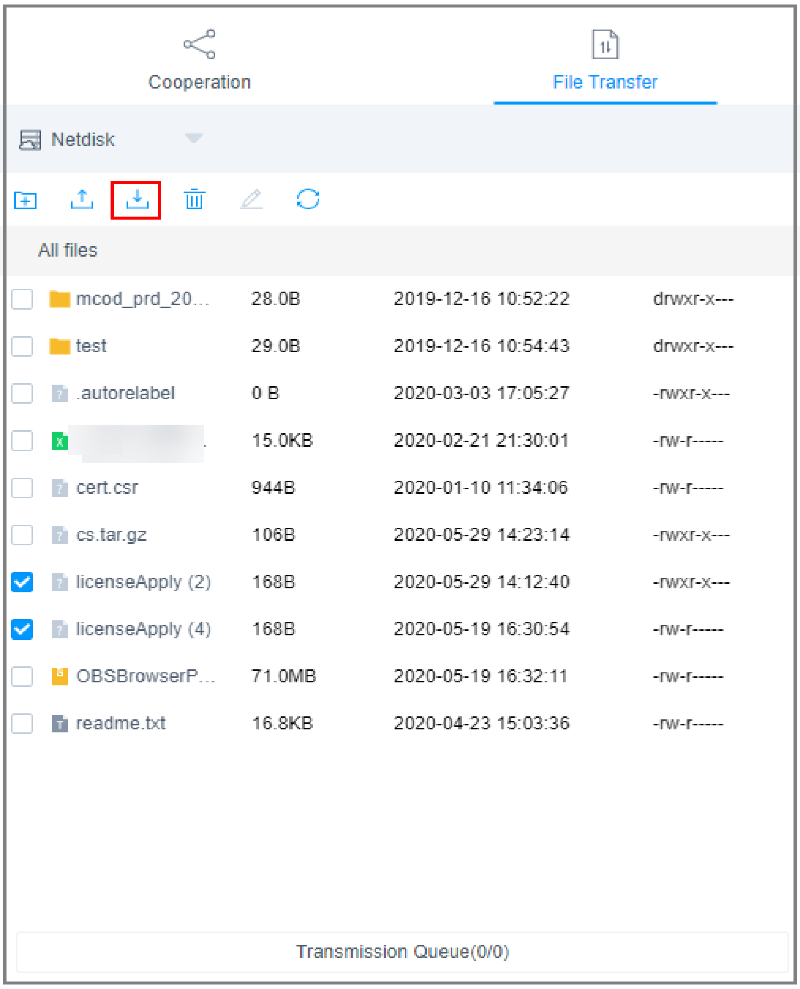


□			19-12-16 10:52:22	drwxr-x---
□	test	29.0B	2019-12-16 10:54:43	drwxr-x---
□	.autorelabel	0 B	2020-03-03 17:05:27	-rwxr-x---
□	[redacted]	15.0KB	2020-02-21 21:30:01	-rw-r-----
□	cert.csr	944B	2020-01-10 11:34:06	-rw-r-----
□	cs.tar.gz	106B	2020-05-29 14:23:14	-rwxr-x---
□	licenseApply (2)	168B	2020-05-29 14:12:40	-rwxr-x---
□	licenseApply (4)	168B	2020-05-19 16:30:54	-rw-r-----
□	OBSBrowserP...	71.0MB	2020-05-19 16:32:11	-rw-r-----
□	readme.txt	16.8KB	2020-04-23 15:03:36	-rw-r-----

Step 7 Download files from the personal net disk.

1. Select one or more files to be downloaded.
2. Click the download icon to download one or more files to the local computer.

Figure 9-13 Downloading files from the personal net disk



□	mcod_prd_20...	28.0B	2019-12-16 10:52:22	drwxr-x---
□	test	29.0B	2019-12-16 10:54:43	drwxr-x---
□	.autorelabel	0 B	2020-03-03 17:05:27	-rwxr-x---
□	[redacted]	15.0KB	2020-02-21 21:30:01	-rw-r-----
□	cert.csr	944B	2020-01-10 11:34:06	-rw-r-----
□	cs.tar.gz	106B	2020-05-29 14:23:14	-rwxr-x---
☑	licenseApply (2)	168B	2020-05-29 14:12:40	-rwxr-x---
☑	licenseApply (4)	168B	2020-05-19 16:30:54	-rw-r-----
□	OBSBrowserP...	71.0MB	2020-05-19 16:32:11	-rw-r-----
□	readme.txt	16.8KB	2020-04-23 15:03:36	-rw-r-----

----End

Uploading Files to and Downloading Files from a Managed Windows Host

For Windows hosts managed in a CBH system, the default path for storing files is **NetDisk G**. This disk is your personal net disk.

Files on a Windows host cannot be directly transferred between the lost and a local computer. They can be transferred only through the personal net disk.

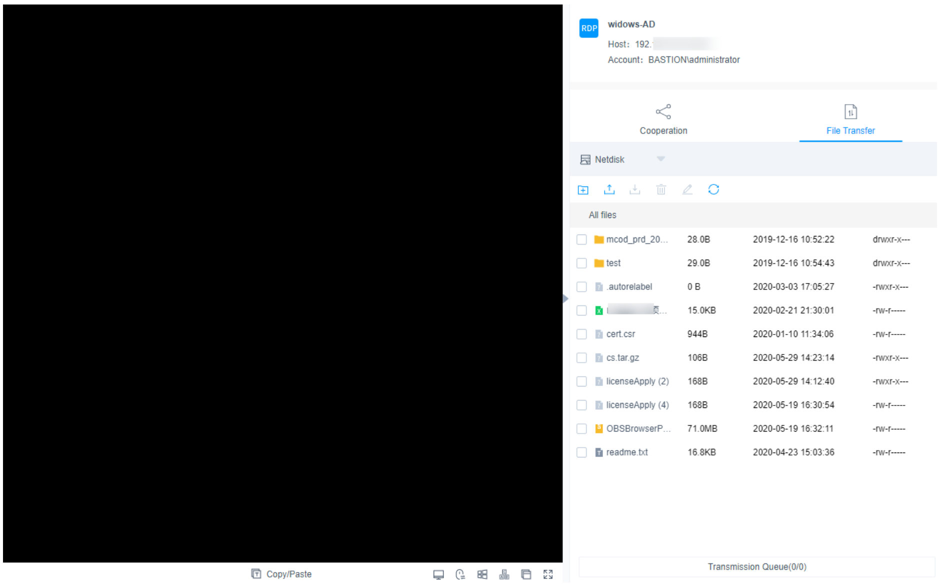
Step 1 Log in to your bastion host.

Step 2 Choose **Operation** > **Host Operation** and locate the target Windows host.

Step 3 Click **Login** to open the Windows host operation session.

Step 4 Click **File Transfer** to list of host files on the personal net disk.

Figure 9-14 Windows host file transfer



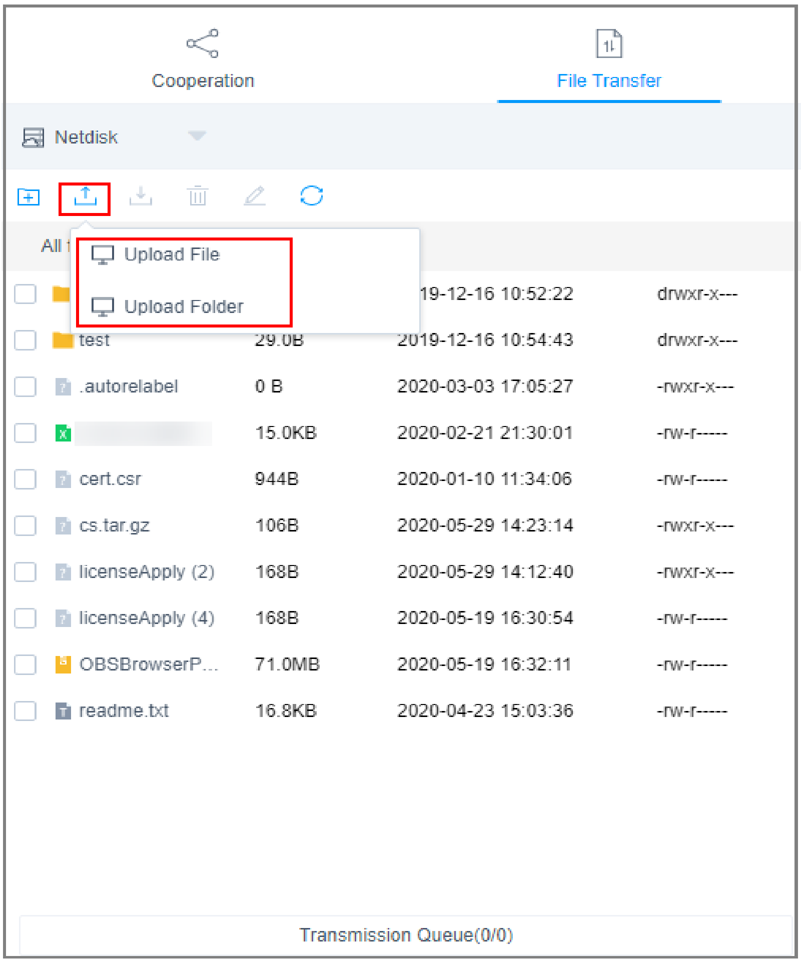
widows-AD
Host: 192.[redacted]
Account: BASTION\administrator

□	mcod_prd_20...	28.0B	2019-12-16 10:52:22	drwxr-x---
□	test	29.0B	2019-12-16 10:54:43	drwxr-x---
□	.autorelabel	0 B	2020-03-03 17:05:27	-rwxr-x---
□	[redacted]	15.0KB	2020-02-21 21:30:01	-rw-r-----
□	cert.csr	944B	2020-01-10 11:34:06	-rw-r-----
□	cs.tar.gz	106B	2020-05-29 14:23:14	-rwxr-x---
□	licenseApply (2)	168B	2020-05-29 14:12:40	-rwxr-x---
□	licenseApply (4)	168B	2020-05-19 16:30:54	-rw-r-----
□	OBSBrowserP...	71.0MB	2020-05-19 16:32:11	-rw-r-----
□	readme.txt	16.8KB	2020-04-23 15:03:36	-rw-r-----

Step 5 Upload files to the Windows host.

1. Click **Upload File** or **Upload Folder** to upload one or more local files or folders.
2. Open the disk directory of the Windows host and search for **NetDisk** on drive G.
3. Open **NetDisk**, right-click the file or folder to be uploaded, copy and paste it to the target directory on the Windows host.

Figure 9-15 Uploading files to the personal net disk



		19-12-16 10:52:22	drwxr-x---
test	29.0B	2019-12-16 10:54:43	drwxr-x---
.autorelabel	0 B	2020-03-03 17:05:27	-rwxr-x---
[redacted]	15.0KB	2020-02-21 21:30:01	-rw-r-----
cert.csr	944B	2020-01-10 11:34:06	-rw-r-----
cs.tar.gz	106B	2020-05-29 14:23:14	-rwxr-x---
licenseApply (2)	168B	2020-05-29 14:12:40	-rwxr-x---
licenseApply (4)	168B	2020-05-19 16:30:54	-rw-r-----
OBSBrowserP...	71.0MB	2020-05-19 16:32:11	-rw-r-----
readme.txt	16.8KB	2020-04-23 15:03:36	-rw-r-----

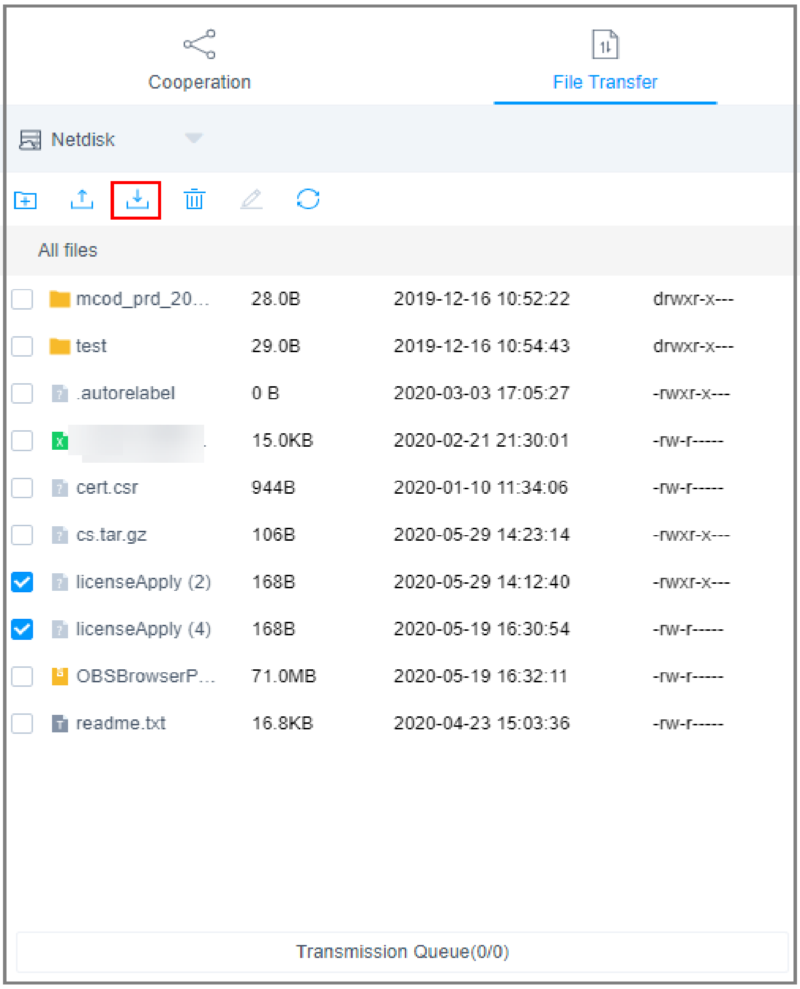
Step 6 Download files from the Windows host.

1. Open the Windows host disk directory, right-click the file or folder to be download, and copy it.
2. Open the **NetDisk** disk directory, right-click and paste the file or folder to the personal net disk.

Step 7 Download files from the personal net disk.

1. Select one or more files to be downloaded.
2. Click the download icon to download one or more files to the local computer.

Figure 9-16 Downloading files from the personal net disk



□	mcod_prd_20...	28.0B	2019-12-16 10:52:22	drwxr-x---
□	test	29.0B	2019-12-16 10:54:43	drwxr-x---
□	.autorelabel	0 B	2020-03-03 17:05:27	-rwxr-x---
□	[redacted]	15.0KB	2020-02-21 21:30:01	-rw-r-----
□	cert.csr	944B	2020-01-10 11:34:06	-rw-r-----
□	cs.tar.gz	106B	2020-05-29 14:23:14	-rwxr-x---
☑	licenseApply (2)	168B	2020-05-29 14:12:40	-rwxr-x---
☑	licenseApply (4)	168B	2020-05-19 16:30:54	-rw-r-----
□	OBSBrowserP...	71.0MB	2020-05-19 16:32:11	-rw-r-----
□	readme.txt	16.8KB	2020-04-23 15:03:36	-rw-r-----

----End

9.1.8 Cooperation

A bastion host supports collaborative operations. A session creator can invite other system users through a URL to join the on-going session. Participants can perform operations on the session after being approved by the session creator. This function can be used in scenarios such as remote demonstration and consultation of difficult O&M problems.

Constraints

- Before sharing an operation session, ensure that the network connection between the bastion host and the managed host is normal. Otherwise, the invited user cannot join the session, and the connection error (code: T_514) is reported on the session window of the creator. The error code T_514 indicates that the server does not respond for a long time and the connection is disconnected, and you need to check your network and try again.
- The invitation URL can be copied and sent to multiple users. Only users with the account permissions of the managed resource can open the invitation URL.

- The invited user can join the session only before the URL expires or the session ends.

Prerequisites

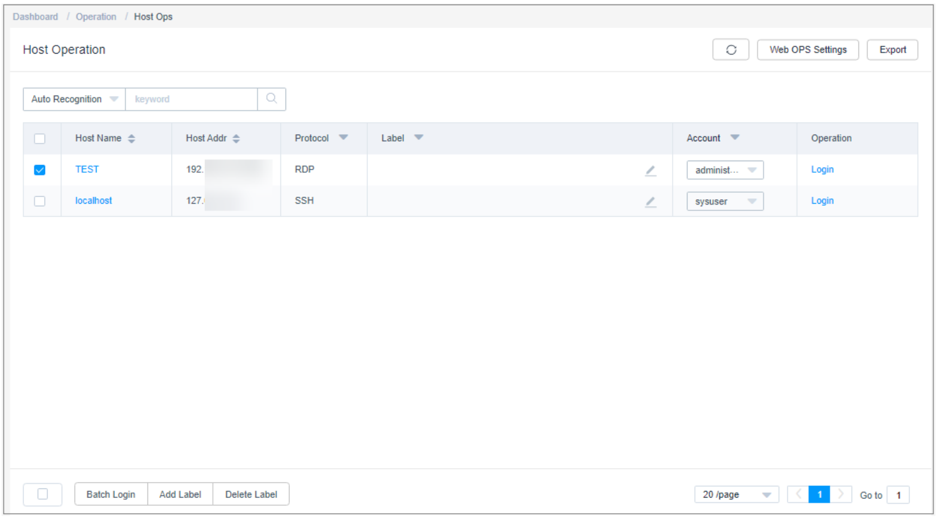
- You have the operation permissions for the host resources.
- You have logged in to the host using a web browser.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Operation** > **Host Operation** to go to the **Host Operation** page.

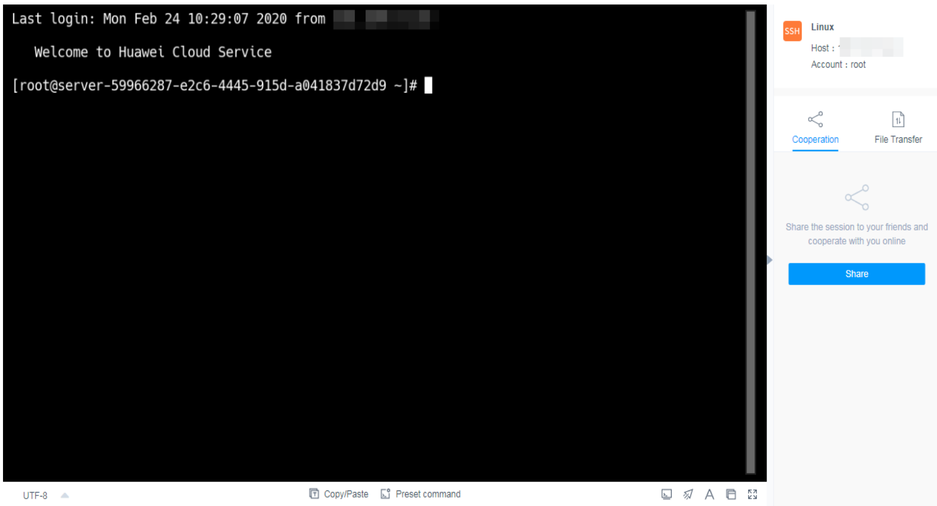
Figure 9-17 Host Operation



☐	Host Name	Host Addr	Protocol	Label	Account	Operation
☑	TEST	192.[redacted]	RDP		administ...	Login
☐	localhost	127.[redacted]	SSH		sysuser	Login

Step 3 Select the host resource you want to operate and click **Login**.

Figure 9-18 Host resource operation page

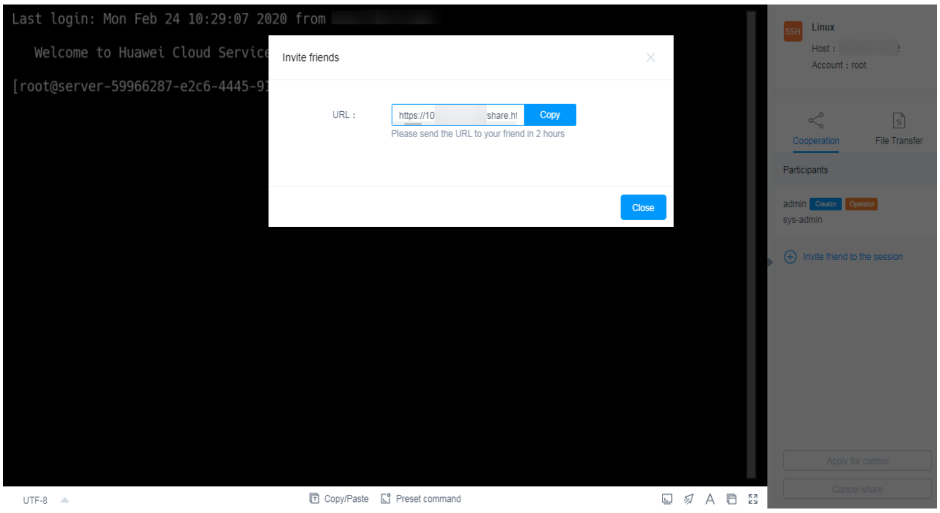


```
Last login: Mon Feb 24 10:29:07 2020 from [redacted]

   Welcome to Huawei Cloud Service

[root@server-59966287-e2c6-4445-915d-a041837d72d9 ~]#
```

Step 4 Click **Share** on the right of the dialog box to invite other users to join the session.

Step 5 Click **Invite friends** to obtain the invitation URL. Copy the URL and send it to the user who has permissions for account of the managed resource.

Figure 9-19 Obtaining the invitation URL



```
Last login: Mon Feb 24 10:29:07 2020 from [redacted]

   Welcome to Huawei Cloud Service

[root@server-59966287-e2c6-4445-9
```

Invite friends

URL : https://10[redacted]share.ht Copy

Please send the URL to your friend in 2 hours

Close

Linux

Host : [redacted]

Account : root

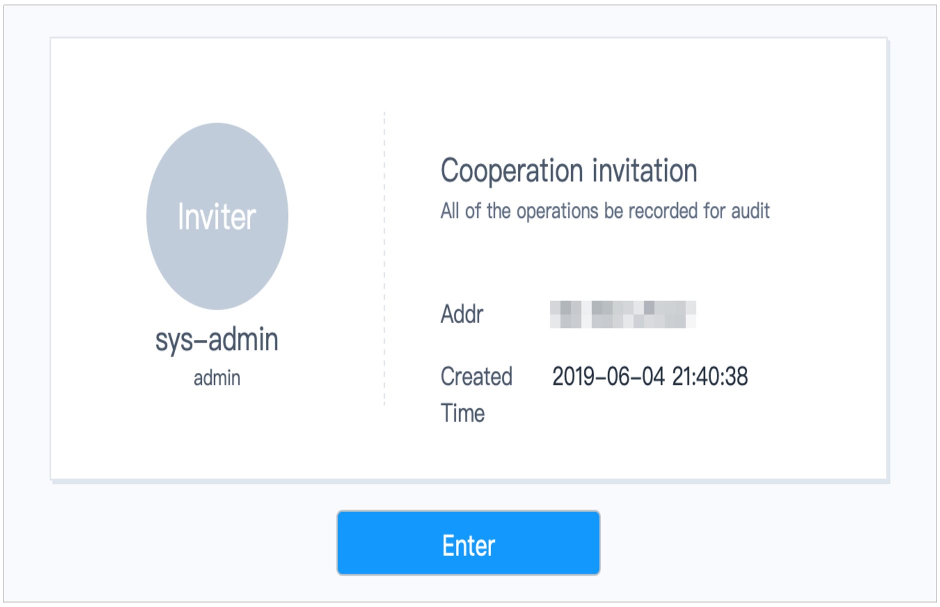
Participants

admin Creator Operator

sys-admin

Step 6 The invited user then can log in to the bastion host, open the invitation URL, and view the invitation information.

Figure 9-20 Invitation information displayed for the invited users



Inviter

sys-admin

admin

Cooperation invitation

All of the operations be recorded for audit

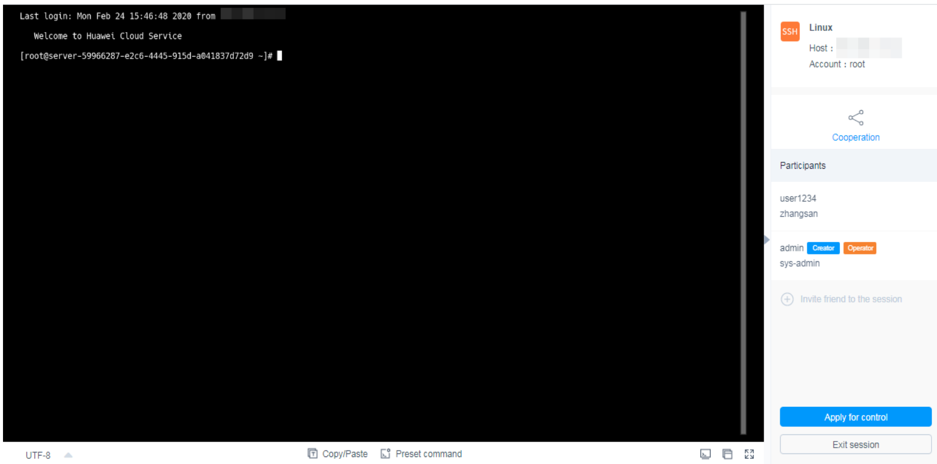
Addr [redacted]

Created Time 2019-06-04 21:40:38

Step 7 As an invited user, click **Enter** to join the session.

- Click **Apply for control** to send a request to the current controller to apply for the control permission.
- Click **Release control** or **Exit session** to hand the session control back to the creator.
- Click **Exit session** to exit the current session. After exiting the session, the invited user can join the session again as long as the invitation URL does not expire and the session remains in progress.

Figure 9-21 Cooperation session page of invited users



```
Last login: Mon Feb 24 15:46:48 2020 from [redacted]
   Welcome to Huawei Cloud Service
[root@server-59966287-e2c6-4445-915d-a041837d72d9 ~]# 
```

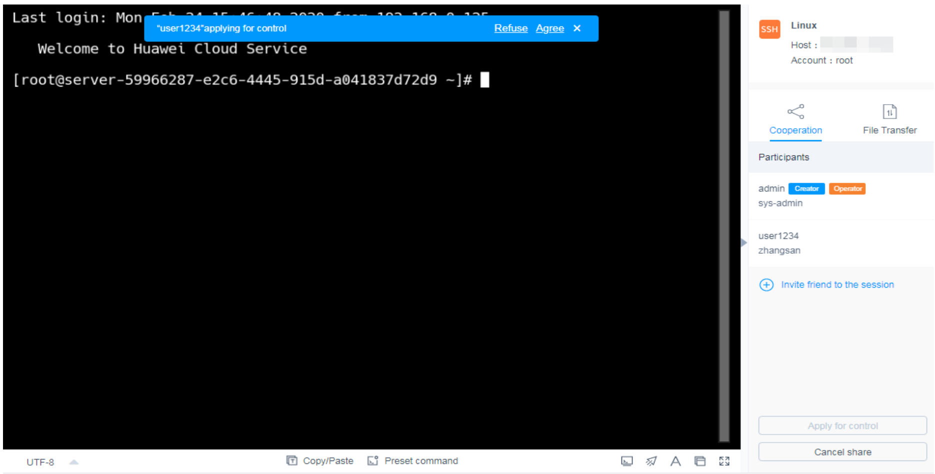
Linux
Host : [redacted]
Account : root

Participants
user1234
zhangsan
admin Creator Operator
sys-admin

Step 8 The creator or the invited user can manage the session.

- If the creator clicks **Cancel share** or exits the session, the cooperation session ends. The invited user is forced to exit the session and cannot access the session again through the URL.
- When an invited user applies for the session control permission, the session creator can click **Agree** to hand over the session control permission or click **Refuse** to reject the application.

Figure 9-22 Cooperation session page of the inviter



```
Last login: Mon
   Welcome to Huawei Cloud Service
[root@server-59966287-e2c6-4445-915d-a041837d72d9 ~]# 
```

"user1234"applying for control Refuse Agree ×

Linux
Host : [redacted]
Account : root

Participants
admin Creator Operator
sys-admin
user1234
zhangsan

----End

9.1.9 Enabling Forcible RDP Connections

When the number of Windows remote desktop connections exceeds the upper limit, you are not allowed to establish remote connections with the host resources. In this case, you can enable the **admin console** in the bastion host to implement force logins. This means you can force the bastion host to establish login connections by forcibly logging out other logged-in users.

This topic describes how to enable the **admin console** configuration for enabling force RDP connections.

Constraints

- This function is available only for hosts using the RDP protocol.
- This function is available to user **admin** only.

Prerequisites

You have the management permissions for the **Host Operations** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Operation** > **Host Operations** to go to the **Host Operations** page.

Step 3 Click **Web OPS Settings**. The configuration window is displayed.

Step 4 Select the **admin console** connection mode.

Step 5 Click **OK** to return to the **Host Operations** page.

After the configuration is successful, when a user attempts to log in to an RDP host, if the number of connections exceeds the upper limit, the user is forced to log in.

----End

9.2 Application Operation

9.2.1 Viewing the Application Resource List and Setting Resource Labels

After obtaining the access permissions for application resources, you can view authorized application resources and set labels for them.

This topic describes how to view authorized resources and set resource labels.

Constraints

Labels cannot be shared with others. You can define your own resource labels for your exclusive use.

Prerequisites

- You have the management permissions for the **App Operations** module.
- You have obtained the access permissions for the resources.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Operation** > **App Operations** to go to the **App Operations** page.

Step 3 Query application resources.

Quick search: Enter a keyword in the search box to quickly query application resources by auto recognition, application name, and application IP address.

Step 4 Add a label to an application resource.

1. Select an application resource you want and click ✎ in the **Label** column.
2. Enter a label type and press **Enter** or select an existing label type.
3. Click **OK**. You can then view the added label on the **App Operations** page.

Step 5 Add a label for multiple application resources at a time.

1. Select multiple resources and click **Add Label** in the lower left corner of the list.
2. Enter a label type and press **Enter** or select an existing label type.
3. Click **OK**. You can then view the added label on the **App Operations** page.

Step 6 Delete an application resource label.

1. Select multiple resources and click **Delete Label** in the lower left corner of the list.
2. In the displayed dialog box, confirm the deletion and click **OK**.

----End

9.2.2 Logging In to Application Resources Using a Web Browser for O&M

After you log in to an application resource using a web browser, the cooperation, file management, and file transfer functions are available for you. A bastion host can log all activities performed on an application resource. The logs can be used for audits.

- Cooperation: This function allows the session initiator to invite other system users to participate the current session by sharing the session link with them, implementing O&M collaboration.
- File management: This function allows all session participants to manage files or folders on hosts and host net disk after they obtain the operation permissions. In addition, they can:
  - Create new folders.
  - Change the name of a file or folder.
  - Delete files or folders in batches.
- File transfer: This function allows session participants to download or upload files or folders on the host or host net disk after they obtain the operation permissions. They can:
  - Upload and download files.
  - Upload folders.
  - Upload multiple files or a folder to a host net disk or download multiple files from a host net disk to a local host, if **Netdisk** is selected as the destination address.

This topic describes how to log in to application resources and perform operations through a web browser.

Constraints

- Currently, application operation is supported by x86 bastion hosts.
- Only web browsers can be used to log in to application resources for O&M.
- Although using a web browser for O&M allows you to copy and paste a large number of characters without garbled characters, a maximum of 80,000 characters can be copied from the local to the remote, and a maximum of 1000,000 of bytes can be copied from the remote to the local.
- File management

  Files and folders cannot be edited in batches.
- File Transmission
  - By default, the system supports the upload of a single file with a maximum size of 100 GB. However, the size of a single file to be uploaded is limited by the **Personal Netdisk** space and browser type.

    NOTE

    If the disk space is insufficient, the upload will fail. In this case, you need to clear the disk or expand the disk capacity.
  - Folders cannot be downloaded.
  - For application resources, only **Netdisk** can be select as the destination address.

Prerequisites

- You have the management permissions for the **App Operation** module.
- You have obtained the access permissions for the resources.
- The network connection between the application server and the system is normal, and the account username and password for logging in to the application server are correct.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Operation** > **App Operations** to go to the **App Operations** page.

Step 3 On the displayed page, select the application resource you want and click **Login** in the **Operation** column to open the session.

Figure 9-23 App operation session

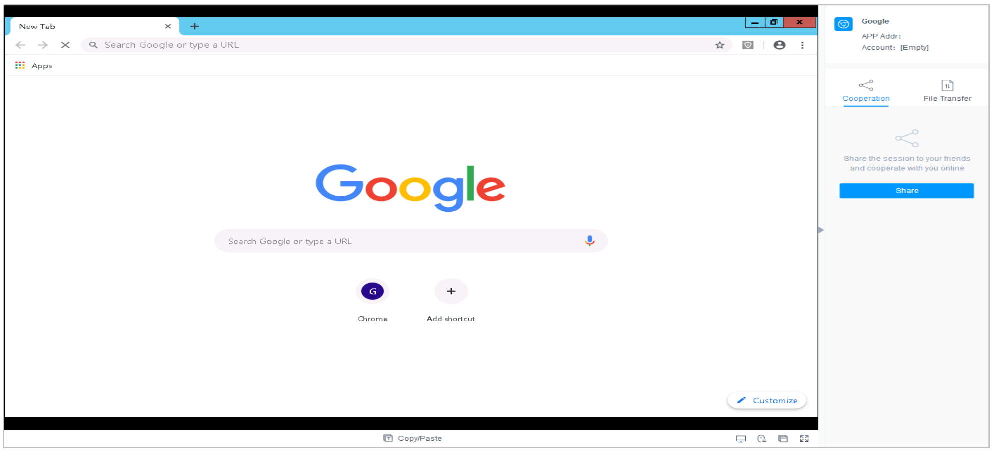

New Tab
Search Google or type a URL
Apps
Google
Search Google or type a URL
G
Chrome
Add shortcut
Customize
Copy/Paste
Google
APP Addr:
Account: [Empty]
Cooperation
File Transfer
Share the session to your friends and cooperate with you online
Share

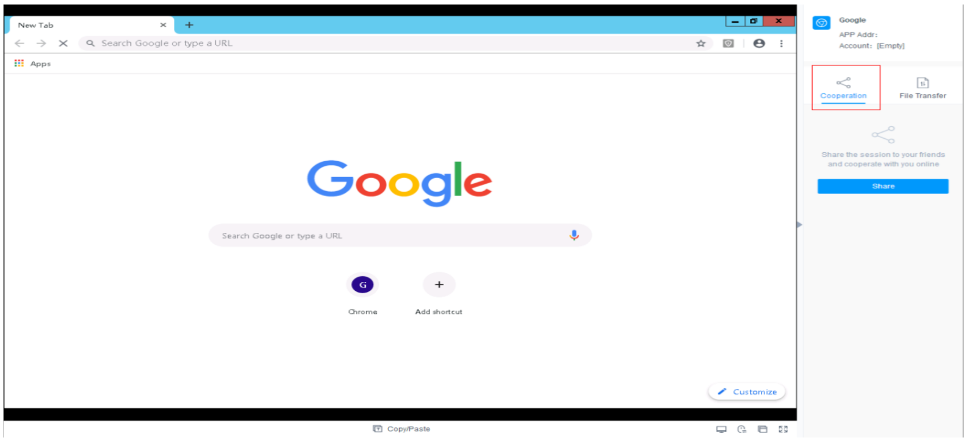
Table 9-9 Parameters for session operation

Parameter	Description
Copy/Paste	Remote text: Select the character you want, press **Ctrl+C** twice to copy the character, and press **Ctrl+V** to paste the character. Remote machine files: Select a text or image, press **Ctrl+B** to copy it, and press **Ctrl+G** to paste it. **NOTE** Although using a web browser for O&M allows you to copy and paste a large number of characters without garbled characters, a maximum of 80,000 characters can be copied from the local to the remote, and a maximum of 1000,000 of bytes can be copied from the remote to the local.
Resolution	You can switch the resolution of the current operation interface. During the switching, a new connection is created.
Switch to remote mouse	You can switch over between the local mouse and remote mouse.
Windows	This Windows icon can be used for easy access to Windows system functions.
Ctrl+Alt +Delete	**Ctrl+Alt+Delete**
Copy window	You can copy the current session window.
Full screen	Displays the window in full screen.

Step 4 Invite other system users to participate in the current session. For details, see **Cooperation**.

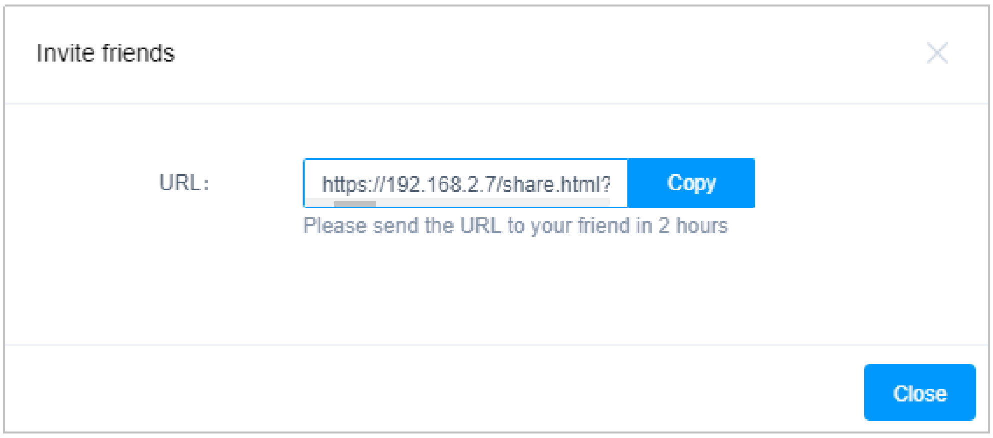
1. Click **Cooperation**. The collaborative session window is displayed.

Figure 9-24 Collaboration session page of the inviter


New Tab
Search Google or type a URL
Apps
Google
Search Google or type a URL
Chrome
Add shortcut
Customize
Copy/Paste
Google
APP Addr:
Account: [Empty]
Cooperation
File Transfer
Share the session to your friends and cooperate with you online
Share

2. Click **Share**. Complete the information in the displayed **Invite friends** dialog box.

Figure 9-25 Collaboration session page of the inviter



Invite friends

URL: https://192.168.2.7/share.html? Copy

Please send the URL to your friend in 2 hours

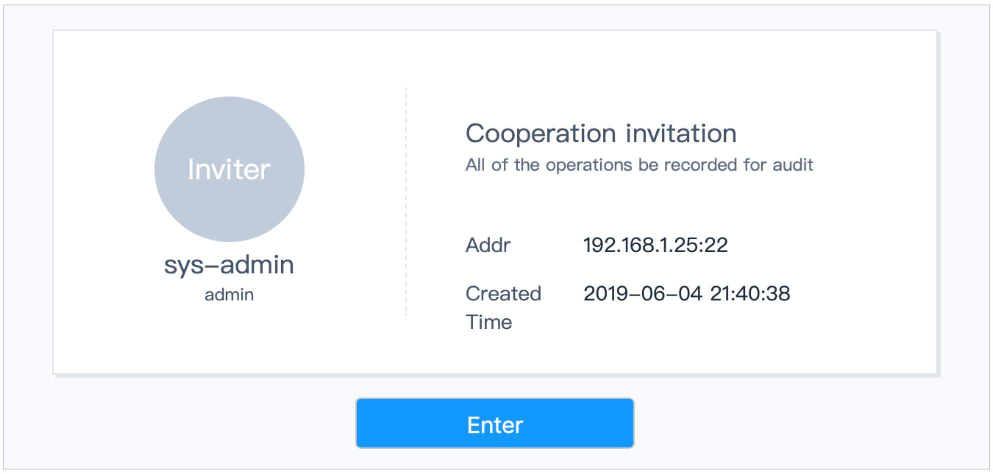
Close

NOTE

The link can be copied and sent to multiple users.

3. Copy the URL and send it to the user who has permissions for accounts managed in the bastion host.
4. Log in to the bastion host as the invited user, open a new browser window, and paste the session link.

Figure 9-26 Collaborative session information



Inviter

sys–admin

admin

Cooperation invitation

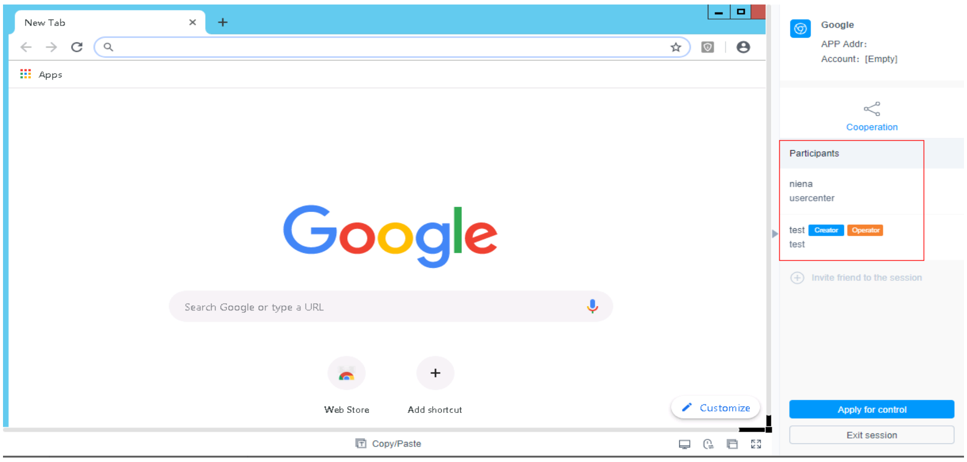
All of the operations be recorded for audit

Addr 192.168.1.25:22

Created Time 2019–06–04 21:40:38

5. If you are invited, click **Enter** to join the session.

Figure 9-27 Collaboration session page of the inviter



Google

APP Addr:

Account: [Empty]

Participants

niena
usercenter

test Creator Operator
test

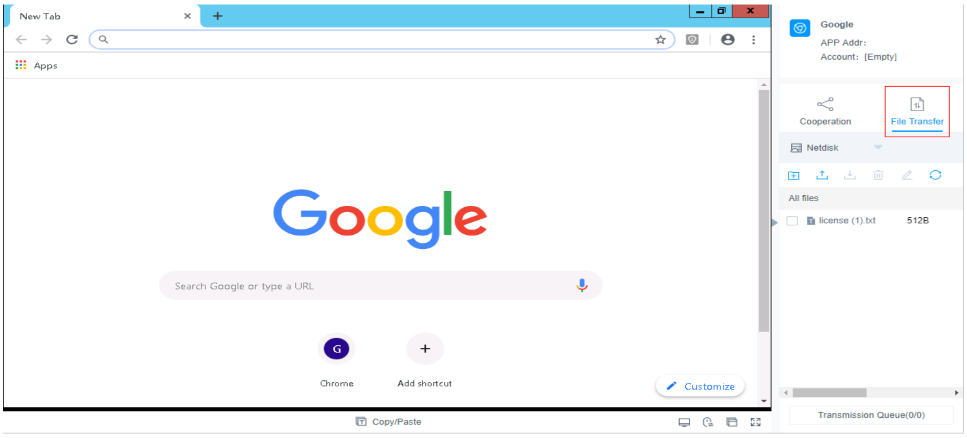
Table 9-10 Parameters for session operation

Parameter	Description
Apply for control	The invited user can apply for control from the invitation sender. Once approved, the invited user can control the current session.
Exit session	Exit the current session.

Step 5 Upload files to or download files from the host or host net disk. For details, see **File Transfer**.

Click **File Transfer** to manage files or folders on the personal net disk.

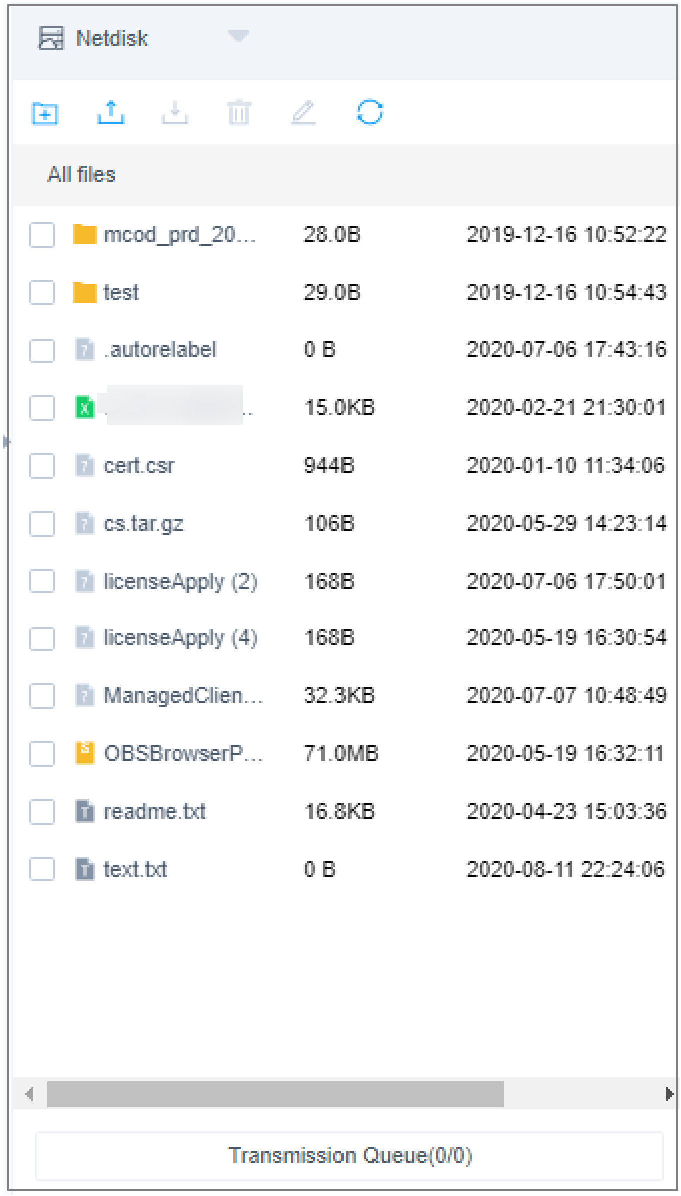
Figure 9-28 File Transmission



Step 6 In the file management area, manage files or folders on the host or host net disk.

1. Click **File Transfer**. The **File Transfer** window is displayed.
2. Click ⊞ to create a folder.

Figure 9-29 New folder



□	mcod_prd_20...	28.0B	2019-12-16 10:52:22
□	test	29.0B	2019-12-16 10:54:43
□	.autorelabel	0 B	2020-07-06 17:43:16
□	[redacted]	15.0KB	2020-02-21 21:30:01
□	cert.csr	944B	2020-01-10 11:34:06
□	cs.tar.gz	106B	2020-05-29 14:23:14
□	licenseApply (2)	168B	2020-07-06 17:50:01
□	licenseApply (4)	168B	2020-05-19 16:30:54
□	ManagedClien...	32.3KB	2020-07-07 10:48:49
□	OBSBrowserP...	71.0MB	2020-05-19 16:32:11
□	readme.txt	16.8KB	2020-04-23 15:03:36
□	text.txt	0 B	2020-08-11 22:24:06

3. Select one or more files or folders and click 🗑 to delete them.
4. Select a file or folder and click ✎ to edit its name.
5. Click ⟳ to refresh all file directories.

----End

10 Audit

10.1 Live Session

10.1.1 Viewing Live Sessions

After a system user logs in to a managed resource via a bastion host, the audit administrator will receive session records in real time. The audit administrator can view and audit live operation sessions to prevent losses caused by violations.

This topic walks you through how to query and view live sessions.

Prerequisites

- You have the management permissions for the **Live Session** module.
- There is at least one live session.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **Live Session**.

Step 3 Query live sessions.

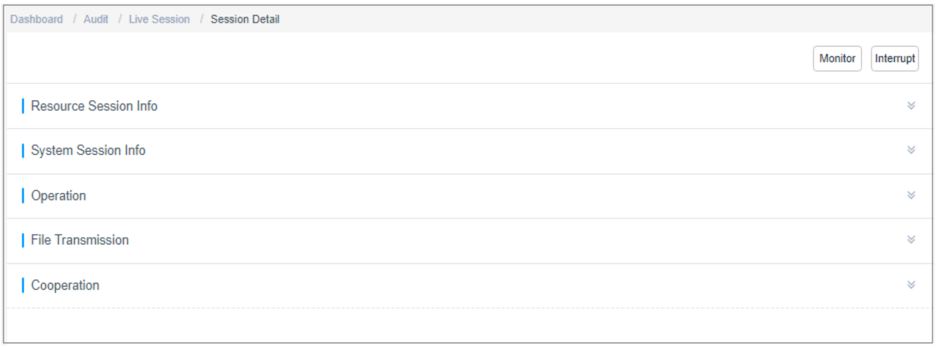
- Quick search

  Enter a keyword in the search box to quickly query live sessions by resource name, account, user, or source IP.
- Advanced search

  Enter keywords in the corresponding attribute search boxes to search for live sessions in exact mode.

Step 4 Click **Detail** in the **Operation** column of the live session you want to view.

Figure 10-1 Viewing Live Sessions



Step 5 View resource session information, system session information, operation records, file transmission records, and collaborative session records.

----End

10.1.2 Monitoring Live Sessions

After a system user logs in to a managed resource through a bastion host, the audit administrator will receive session records in real time. The audit administrator can monitor live sessions to audit real-time operations of other system users.

This topic describes how to monitor OM operations in live sessions.

Prerequisites

- You have the management permissions for the **Live Session** module.
- There is at least one live session.
- Currently, only H5 O&M sessions and SSH client sessions are supported.

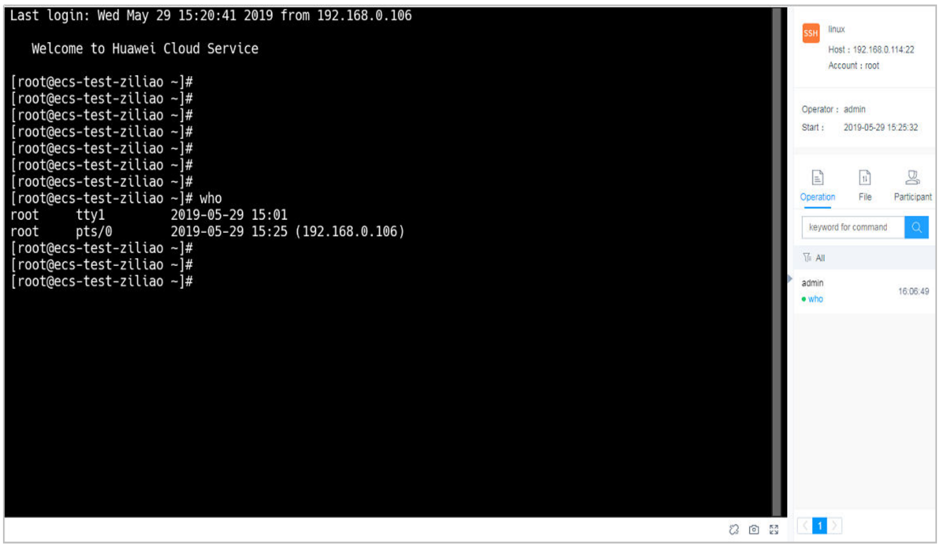
Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **Live Session**.

Step 3 Click **Monitor** in the **Operation** column of the live session you want to monitor. The OM session window is visible to you.

Figure 10-2 Monitoring Live Sessions



```
Last login: Wed May 29 15:20:41 2019 from 192.168.0.106

   Welcome to Huawei Cloud Service

[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]# who
root     tty1         2019-05-29 15:01
root     pts/0        2019-05-29 15:25 (192.168.0.106)
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
```

linux
Host : 192.168.0.114:22
Account : root

Operator : admin
Start : 2019-05-29 15:25:32

admin
who 16:06:49

Step 4 In the displayed session window, view real-time operations, historical OM operations, file transmission records, and participant records of the session.

----End

10.1.3 Interrupting a Live Session

After a system user logs in to a managed resource through a bastion host, the audit administrator will receive session records in real time. When discovering violations or high-risk operations, the audit administrator can interrupt the session to prevent the system user from performing further operations.

This topic describes how to interrupt live sessions.

Prerequisites

- You have the management permissions for the **Live Session** module.
- There is at least one live session.

Procedure

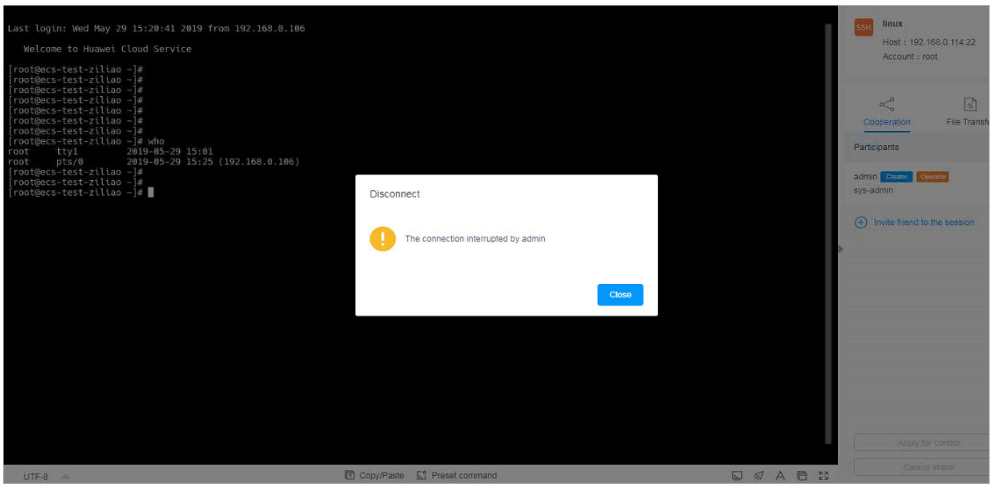
Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **Live Session**.

Step 3 Click **Interrupt** in the **Operation** column of the session to forcibly disconnect the session.

After the session is interrupted, the session window is immediately disconnected and the system user receives a message indicating that the session is interrupted.

Figure 10-3 Session interrupted



```
Last login: Wed May 29 15:20:41 2019 from 192.168.0.106

   Welcome to Huawei Cloud Service

[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]# who
root     tty1         2019-05-29 15:01
root     pts/0        2019-05-29 15:25 (192.168.0.106)
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
[root@ecs-test-ziliao ~]#
```

Disconnect

The connection interrupted by admin

Close

linux

Host : 192.168.0.114:22

Account : root

Participants

admin Creator Operator

sys-admin

----End

10.2 History Session

10.2.1 Viewing History Sessions

After an operation is finished, the audit administrator will receive a history session record as well. The audit administrator can query operation record details and audit historical sessions online.

Constraints

- Text and video audit are available for operations performed through a web browser.
- For O&M operations, file transfer, and database operations through an SSH client, video audit is unavailable.
- Details about **account verification** for accessing managed resources will not be recorded.
- Only valid session logs can be played. Valid session logs start when you initiate a session and end when the last operation is completed.

Prerequisites

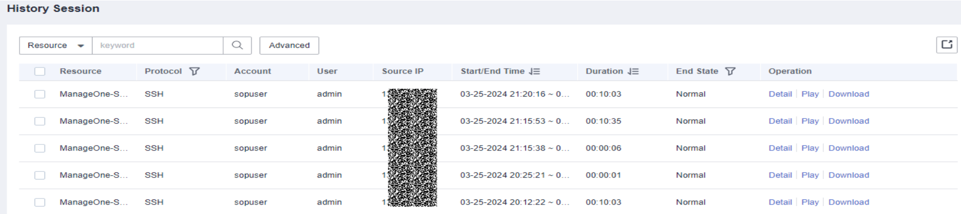
- You have the management permissions for the **History Session** module.
- The OM session has finished.

Viewing History Sessions

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **History Session**.

Figure 10-4 History Session



History Session

Resource ▾ keyword 🔍 Advanced

□	Resource	Protocol	Account	User	Source IP	Start/End Time	Duration	End State	Operation
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:20:16 ~ 0...	00:10:03	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:15:53 ~ 0...	00:10:35	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:15:38 ~ 0...	00:00:06	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 20:25:21 ~ 0...	00:00:01	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 20:12:22 ~ 0...	00:10:03	Normal	Detail | Play | Download

NOTE

The **More** operation in the **Details** column is removed from version 3.3.42.0 or later versions.

Step 3 Query history sessions.

- Quick search

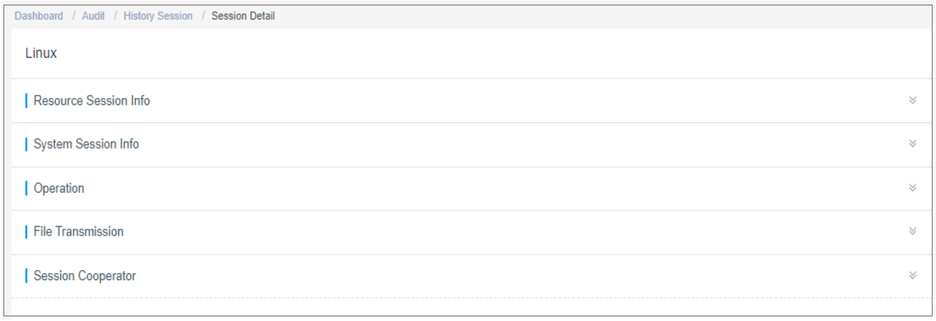
  Enter a keyword in the search box to quickly query history sessions by resource name, account, user, or source IP.

- Advanced search

  Enter keywords in the corresponding attribute search boxes to search for history sessions in exact mode.

Step 4 Click **Detail** in the **Operation** column of the history session you want to view.

Figure 10-5 Viewing History Sessions



Dashboard / Audit / History Session / Session Detail

Linux

Resource Session Info

System Session Info

Operation

File Transmission

Session Cooperator

Step 5 View resource session information, system session information, operation records, file transmission records, and collaborative session records.

For a history session, you can view the resource name, type, host IP address, account, start and end time, session duration, session size, operation user, source IP address and MAC address of the operation user, login mode, operation records, file transfer records, and session collaboration records.

----End

Online Playback of History Session

NOTE

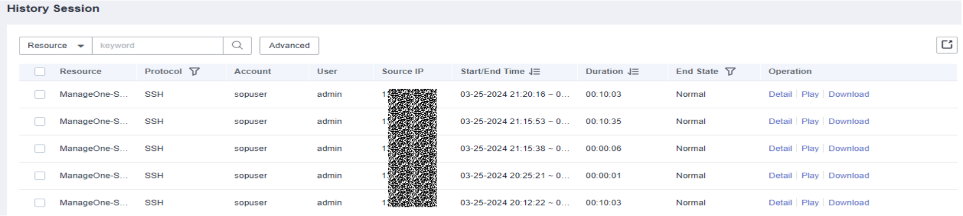
The total duration and playable duration of a downloaded video file may be different because the logout time and last operation time are different.

- The total duration starts from the time when a system user logs in to a resource to the time they log out of the resource.
- The playable duration starts from the time a system user logs in to a resource to the time the last session is complete.

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **History Session**.

Figure 10-6 History Session



History Session

Resource ▾ | keyword | Advanced

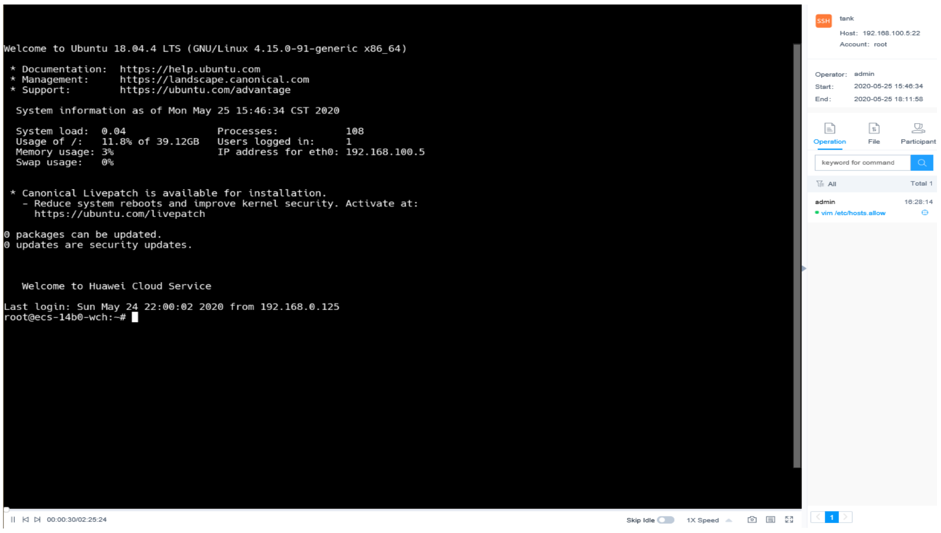
□	Resource	Protocol	Account	User	Source IP	Start/End Time	Duration	End State	Operation
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:20:16 ~ 0...	00:10:03	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:15:53 ~ 0...	00:10:35	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:15:38 ~ 0...	00:00:06	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 20:25:21 ~ 0...	00:00:01	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 20:12:22 ~ 0...	00:10:03	Normal	Detail | Play | Download

NOTE

The **More** operation in the **Details** column is removed from version 3.3.42.0 or later versions.

Step 3 Click **Play** in the **Operation** column of the historical session you want to audit.

Figure 10-7 History session video playback



```
Welcome to Ubuntu 18.04.4 LTS (GNU/Linux 4.15.0-91-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Mon May 25 15:46:34 CST 2020

  System load:  0.04               Processes:           108
  Usage of /:   11.8% of 39.12GB   Users logged in:     1
  Memory usage: 3%                 IP address for eth0: 192.168.100.5
  Swap usage:   0%


 * Canonical Livepatch is available for installation.
   - Reduce system reboots and improve kernel security. Activate at:
     https://ubuntu.com/livepatch

0 packages can be updated.
0 updates are security updates.



   Welcome to Huawei Cloud Service

Last login: Sun May 24 22:00:02 2020 from 192.168.0.125
root@ecs-14b0-wch:~#
```

SSH tank
Host: 192.168.100.5:22
Account: root

Operator: admin
Start: 2020-05-25 15:46:34
End: 2020-05-25 18:11:58

admin 16:28:14
vim /etc/hosts.allow

Step 4 Play the video recording the entire session operation process.

- In the session window, check the total duration and drag the playback progress bar as needed.
- In the right pane of the session window, you can view information such as operation instructions, file transfer records, participants of the session, and join a live session to monitor the participants.

Step 5 Skip idle playback.

- If **Skip Idle** is enabled, only the content containing the session operations is played.
- This function is disabled by default.

Step 6 Control playback speed as needed.

Click **1X** and select a playback speed. You can select **1X**, **2X**, **4X**, **8X**, or **16X**.

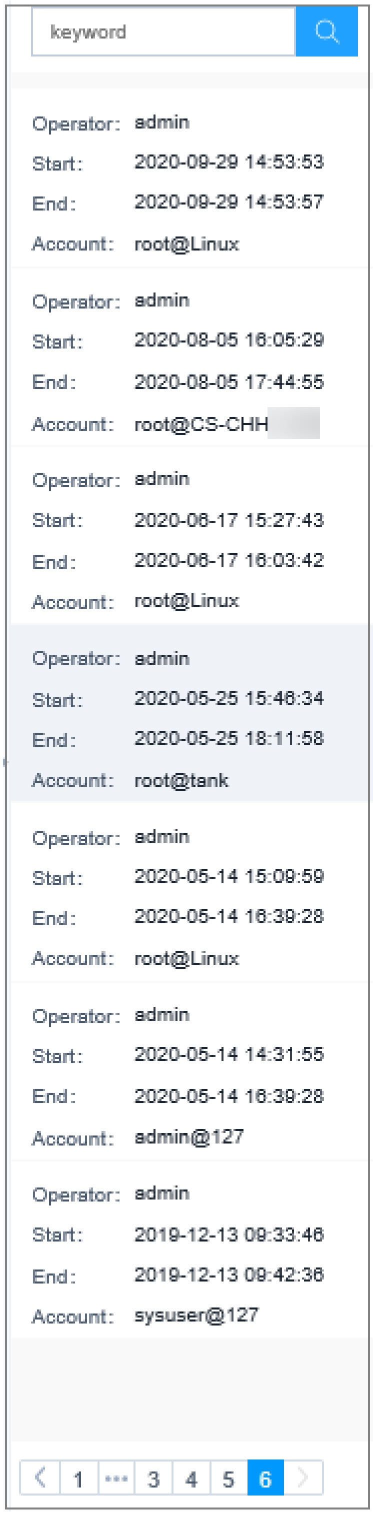
Step 7 Take a quick screenshot of the session.

Click 📷 to generate a screenshot in .png format.

Step 8 Query the playlist.

1. Click ☰ to expand the playlist on the right of the session window. Then you can select a history session to play its video.
2. Enter a login name or account name in the search box to search for a historical session.
3. Click the target session to play its video immediately.

Figure 10-8 History session playback list



Operator: admin
Start: 2020-09-29 14:53:53
End: 2020-09-29 14:53:57
Account: root@Linux

Operator: admin
Start: 2020-08-05 16:05:29
End: 2020-08-05 17:44:55
Account: root@CS-CHH[redacted]

Operator: admin
Start: 2020-06-17 15:27:43
End: 2020-06-17 16:03:42
Account: root@Linux

Operator: admin
Start: 2020-05-25 15:46:34
End: 2020-05-25 18:11:58
Account: root@tank

Operator: admin
Start: 2020-05-14 15:09:59
End: 2020-05-14 16:39:28
Account: root@Linux

Operator: admin
Start: 2020-05-14 14:31:55
End: 2020-05-14 16:39:28
Account: admin@127

Operator: admin
Start: 2019-12-13 09:33:46
End: 2019-12-13 09:42:36
Account: sysuser@127

----End

10.2.2 Exporting History Session Records

You can export all history session records for offline audits.

Prerequisites

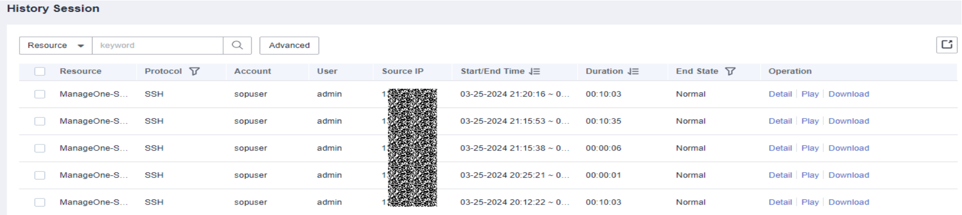
- You have the management permissions for the **History Session** module.
- The OM session has finished.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **History Session**.

Figure 10-9 History Session



History Session

Resource ▾ | keyword | Advanced

□	Resource	Protocol	Account	User	Source IP	Start/End Time	Duration	End State	Operation
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:20:16 ~ 0...	00:10:03	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:15:53 ~ 0...	00:10:35	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:15:38 ~ 0...	00:00:06	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 20:25:21 ~ 0...	00:00:01	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 20:12:22 ~ 0...	00:10:03	Normal	Detail | Play | Download

NOTE

The **More** operation in the **Details** column is removed from version 3.3.42.0 or later versions.

Step 3 (Optional) Select one or more history session logs.

If no log is selected, all historical session logs are exported by default.

Step 4 Click **Export** in the upper right corner to download the CSV file.

----End

10.2.3 Managing Session Videos

After an operation is finished, the audit administrator will receive a history session record as well. As an audit administrator, you can audit operation commands on Linux hosts and operations on Windows hosts. They can also generate, download, or delete operation videos for different audit purposes.

Constraints

- Text and video audit are available for operations performed through a web browser.
- For O&M operations, file transfer, and database operations through an SSH client, video audit is unavailable.
- Only valid session logs can be played. Valid session logs start when you initiate a session and end when the last operation is completed.
- Session videos are cached in your bastion host. You are advised to move the videos to a local computer in a timely manner and clear the system disk space.

Prerequisites

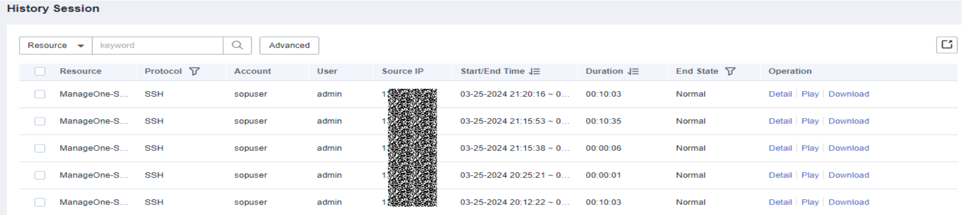
- You have the management permissions for the **History Session** module.
- The OM session has finished.

Generating Session Videos

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **History Session**.

Figure 10-10 History Session



History Session

Resource ▾ keyword Advanced

□	Resource	Protocol	Account	User	Source IP	Start/End Time	Duration	End State	Operation
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:20:16 ~ 0...	00:10:03	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:15:53 ~ 0...	00:10:35	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:15:38 ~ 0...	00:00:06	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 20:25:21 ~ 0...	00:00:01	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 20:12:22 ~ 0...	00:10:03	Normal	Detail | Play | Download

NOTE

The **More** operation in the **Details** column is removed from version 3.3.42.0 or later versions.

Step 3 In the **Operation** column of a history session, choose **More** > **Generate Video**. The system starts generating a video for the session.

The task center displays a message indicating that a task is being executed. After the task is finished, a notification is sent to you through the message center indicating that the session video is generated.

NOTE

- If the bastion host has abundant storage space, the video duration and size are not limited.
- If the system storage space is insufficient, the video may fail to be generated.
- Session recordings can be backed up to OBS buckets. For details, see **Configuring OBS Buckets for Remote Log Backup**.

----End

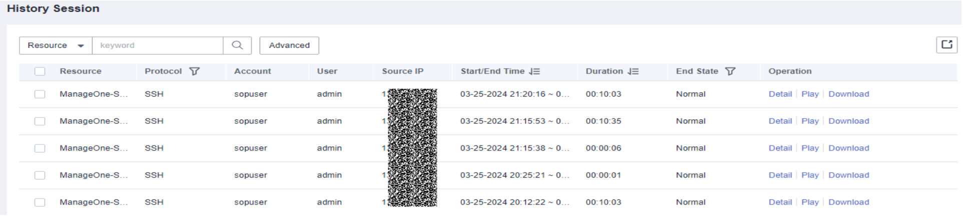
Downloading a Session Video

After a video is generated, it is cached in the system and occupies the system storage space. To save system storage space, download videos and save them locally.

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **History Session**.

Figure 10-11 History Session



History Session

Resource ▾ keyword Advanced

□	Resource	Protocol	Account	User	Source IP	Start/End Time	Duration	End State	Operation
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:20:16 ~ 0...	00:10:03	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:15:53 ~ 0...	00:10:35	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 21:15:38 ~ 0...	00:00:06	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 20:25:21 ~ 0...	00:00:01	Normal	Detail | Play | Download
□	ManageOne-S...	SSH	sopuser	admin	1[redacted]	03-25-2024 20:12:22 ~ 0...	00:10:03	Normal	Detail | Play | Download

NOTE

The **More** operation in the **Details** column is removed from version 3.3.42.0 or later versions.

Step 3 In the **Operation** column of the history session recording you want to download, click **Download** to download it.

After the video is downloaded, a notification is sent to you through the message center.

NOTE

To play back a session recording in a compressed package, perform the following steps:

1. Download the **local player tool** by referring to **Download Center**.
2. Open the local player tool and drag the downloaded package to the playback window.

----End

10.3 System Logs

10.3.1 Querying System Logs

System logs include system login logs and system operation logs. System login logs record all login activities. System operation logs record all operations performed on the bastion host console after login, including but not limited to adding, deleting, and modifying resource accounts or system users, as well as logins.

For example, after a system user logs in to a bastion host and performs operations such as permission configuration and audit management, you, the audit administrator, will receive system log records. You can query login and operation log details to audit system logs online.

Prerequisites

You have the management permissions for the **System Logon** or **System Operation** module under **System Log**.

Querying System Logon Logs

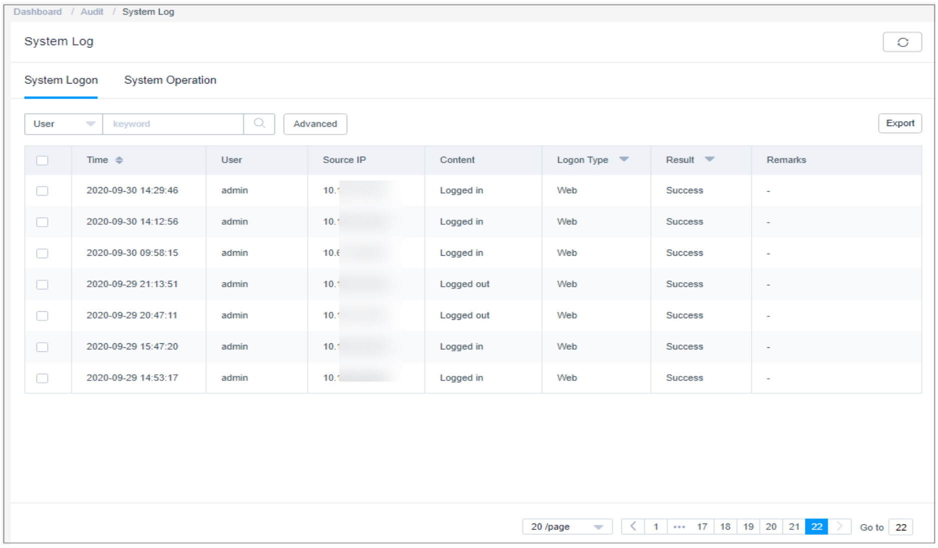
Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **System Log** > **System Logon** to switch to the system log page.

NOTE

In system operation logs, O&M task results record whether O&M tasks are complete. System logs do not include the execution results of specific commands or scripts in an O&M task.

Figure 10-12 System logon logs



☐	Time	User	Source IP	Content	Logon Type	Result	Remarks
☐	2020-09-30 14:29:46	admin	10.1[redacted]	Logged in	Web	Success	-
☐	2020-09-30 14:12:56	admin	10.1[redacted]	Logged in	Web	Success	-
☐	2020-09-30 09:58:15	admin	10.6[redacted]	Logged in	Web	Success	-
☐	2020-09-29 21:13:51	admin	10.1[redacted]	Logged out	Web	Success	-
☐	2020-09-29 20:47:11	admin	10.1[redacted]	Logged out	Web	Success	-
☐	2020-09-29 15:47:20	admin	10.1[redacted]	Logged in	Web	Success	-
☐	2020-09-29 14:53:17	admin	10.1[redacted]	Logged in	Web	Success	-

Step 3 Query login logs.

- Quick search

  Enter a keyword in the search box to quickly query system logon logs by user, source IP address, start time, end time, and log content.

- Advanced search

  Enter keywords in the corresponding attribute search boxes to search for system login logs in exact mode.

Step 4 View the login logs in the search result.

----End

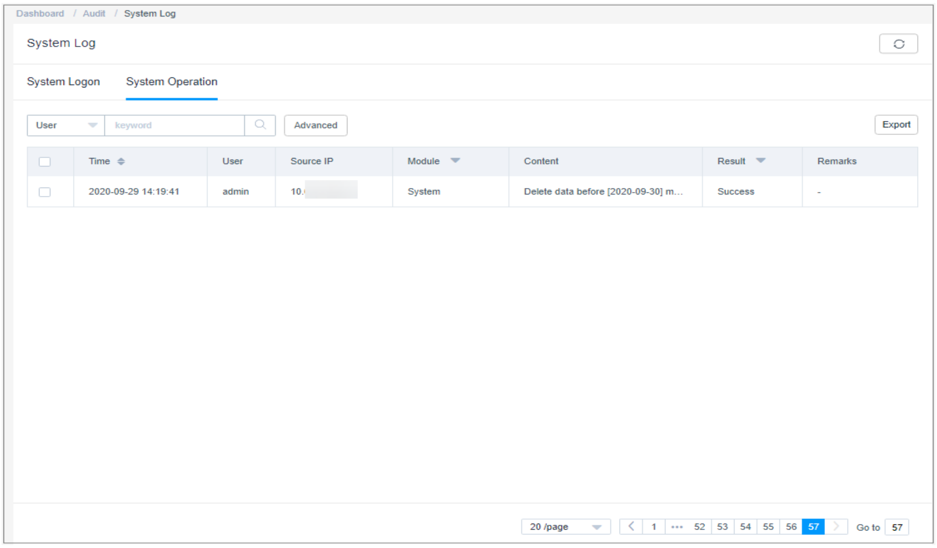
Viewing System Operation Logs

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **System Log** to go to the system log page.

Step 3 Click the **System Operation** tab.

Figure 10-13 System operation logs



☐	Time	User	Source IP	Module	Content	Result	Remarks
☐	2020-09-29 14:19:41	admin	10.[redacted]	System	Delete data before [2020-09-30] m...	Success	-

Step 4 Query operation logs.

- Quick search

  Enter a keyword in the search box to quickly query operation logs by user, source IP address, start time, end time, and log content.

- Advanced search

  Enter keywords in the corresponding attribute search boxes to search for operation logs in exact mode.

Step 5 View the operation logs in the search result.

----End

10.3.2 Exporting System Logs

After a system user logs in to a bastion host and performs operations such as permission configuration and audit management, you, the audit administrator, will receive system log records. You can query login and operation record details in a bastion host and audit system logs online. System logs include system login logs and system operation logs.

Prerequisites

You have the management permissions for the **System Logon** or **System Operation** module under **System Log**.

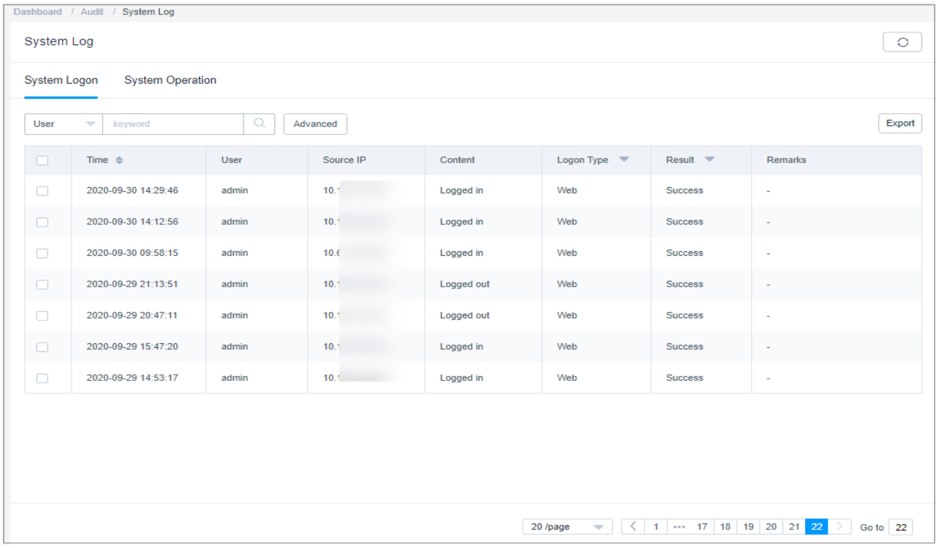
Exporting System Logon Logs

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **System Log** to go to the system log page.

Step 3 In the **System Logon** tab, click **Export** in the upper right corner to export system logon logs.

Figure 10-14 System logon logs



☐	Time	User	Source IP	Content	Logon Type	Result	Remarks
☐	2020-09-30 14:29:46	admin	10.1[redacted]	Logged in	Web	Success	-
☐	2020-09-30 14:12:56	admin	10.1[redacted]	Logged in	Web	Success	-
☐	2020-09-30 09:58:15	admin	10.6[redacted]	Logged in	Web	Success	-
☐	2020-09-29 21:13:51	admin	10.1[redacted]	Logged out	Web	Success	-
☐	2020-09-29 20:47:11	admin	10.1[redacted]	Logged out	Web	Success	-
☐	2020-09-29 15:47:20	admin	10.1[redacted]	Logged in	Web	Success	-
☐	2020-09-29 14:53:17	admin	10.1[redacted]	Logged in	Web	Success	-

Step 4 (Optional) Select one or more login logs.

If no log is selected, all login logs are exported by default.

Step 5 Click **Export** in the upper right corner to download the CSV file.

----End

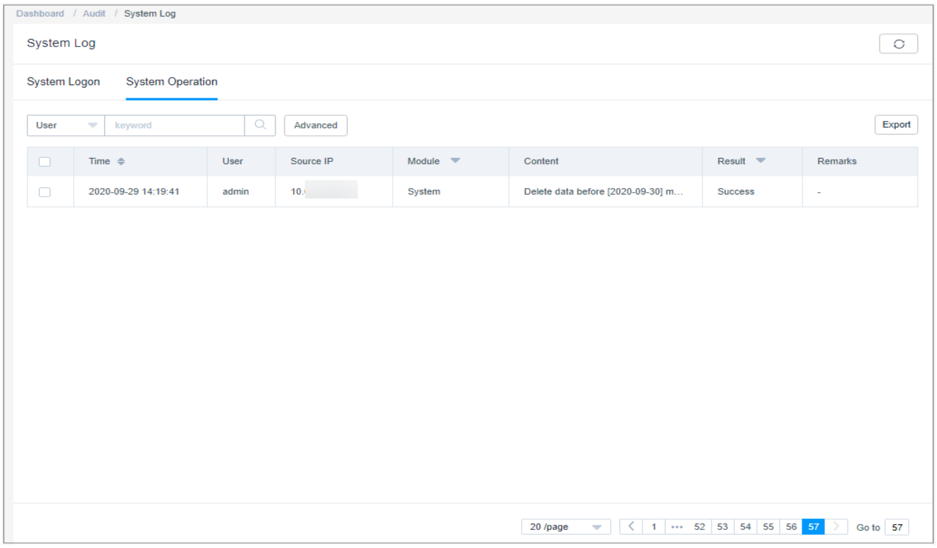
Exporting System Operation Logs

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **System Log** to go to the system log page.

Step 3 Click the **System Operation** tab.

Figure 10-15 System operation logs



☐	Time	User	Source IP	Module	Content	Result	Remarks
☐	2020-09-29 14:19:41	admin	10.[redacted]	System	Delete data before [2020-09-30] m...	Success	-

Step 4 (Optional) Select one or more operation logs.

If no log is selected, all operation logs are exported by default.

Step 5 Click **Export** in the upper right corner to download the CSV file.

----End

10.4 Operation Report

10.4.1 Viewing Operation Reports

As the audit administrator, you can view and export operation details reports. An operation report includes the **Operation Stat**, **Logon Stat**, **Duration Stat**, **SrcIP Stat**, **Cooperation Stat**, **Approval Stat**, **Interception Stat**, **Command Stat**, and **File Stat** graphs.

Constraints

- Operation statistics for a maximum of 180 consecutive days can be viewed.
  - By default, the operation data of the current day is displayed by the hour.
  - If the time range you select falls into a week of a month, the operation data is displayed by the day.
  - If the time range you select falls into a week spanning different months, the operation data can be displayed by the day or by the month.
  - If the time range you select spans different weeks of a month, the operation data can be displayed by the day or by the week.
  - If the time range you select spans different weeks of different months, the operation data can be displayed by the day, by the week, or by the month.
- You can view operation statistics in line, bar, or pie charts.
  - 📈: indicates statistics will be displayed in a line chart.
  - 📊: indicates that statistics will be displayed in a bar chart.
  - Only the command interception trend chart can be displayed in a pie chart.
- By default, the **Operation Stat** trend chart is displayed. It allows you to:
  - View operation statistics trend chart by user. A maximum of five users can be selected.
  - View operation statistics trend chart by resource. A maximum of five resources can be selected.

Prerequisites

You have the management permissions for the **Operation Report** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **Operation Report**.

Step 3 Click each statistics tab and view the details.

The following describes details about each tab.

----End

Operation Stat

Displays the distribution of accessed resources by user or by resource. By default, the statistics of the current day is displayed by the hour.

In the detailed data area, view the session start and end time, user login name, resource name, protocol type, and account.

Logon Stat

Displays the number of historical sessions by user or by resource. By default, the statistics of the current day is displayed by the hour.

In the detailed data area, view the session start and end time, user login name, resource name, protocol type, and account.

Duration Stat

Displays the duration of history sessions by user or by resource. By default, the statistics of the current day is displayed by the hour.

In the detailed data area, view the session start and end time, user login name, resource name, protocol type, account, and session duration.

SrcIP Stat

Displays the number of source IP addresses from which sessions are established by user or by resource. By default, the statistics of the current day is displayed by the hour.

In the detailed data area, view the session start and end time, user login name, resource name, protocol type, account, and source IP address.

Cooperation Stat

Displays the number of users participating in a cooperation session by user or by resource. By default, the statistics of the current day is displayed by the hour.

In the detailed data area, view the session start and end time, user login name, resource name, protocol type, account, and login names of session participants.

Two-person authorization

Displays the number of sessions requiring two-person approval by user or by resource. By default, the statistics of the current day is displayed by the hour.

In the detailed data area, view the approval time, user login name, resource name, protocol type, account, and login names of approvers.

Interception Stat

Displays the number of intercepted commands by user or by resource. By default, the statistics of the current day is displayed by the hour.

Intercepting a command includes three actions, disconnecting the session, rejecting the session, or asking dynamical approval.

In the detailed data area, view the operation time, user login name, resource name, protocol type, account, and action.

Command Stat

Displays the number of executed commands by user or resource. By default, the statistics of the current day is displayed by the hour.

In the detailed data area, view the operation time, user login name, resource name, protocol type, account, and operation instructions.

File Stat

Displays the number of files uploaded and downloaded by user or by resource. By default, the statistics of the current day is displayed by the hour.

In the detailed data area, view the file operation time, user login name, resource name, protocol type, account, operation type, and file name.

10.4.2 Pushing Operation Reports

For your convenience of audit, you can manually export the operation reports or enable the auto send function to let the bastion host push operation reports to you through emails at the interval you select.

- Operation reports can be automatically sent by the day, week, and month.
- The report format can be PDF, DOC, XLS, or HTML.
- An operation report for a maximum of 180 consecutive days can be pushed each time.

Prerequisites

- You have the management permissions for the **Operation Report** module.
- You have completed **Configuring the Outgoing Mail Server**.

Manually Exporting an Operation Report

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **Operation Report**.

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

Step 4 In the displayed **Export** dialog box, configure the method and time to export the report and the report format.

Table 10-1 Parameters for exporting operation reports

Parameter	Description
Granularity	Time granularity for displaying the trend chart of the operation report. The options are **Hourly**, **Daily**, **Weekly**, and **Monthly**.
Time	Start time and end time to generate the operation report to be exported. ● Start time and end time are mandatory. ● A maximum of 180 consecutive days are allowed.
Report Type	Type of operation statistics to be included in the operation report.
File format	Format of the report. You can select only one format. ● DOC is selected by default. ● You can download a report in PDF, DOC, XLS, or HTML.

Step 5 Click **OK** to export the operation report immediately.

----End

Automatically Pushing a System Report

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **Operation Report**.

Step 3 On the displayed page, click **Auto Send** in the upper right corner.

Step 4 In the displayed **Auto Send** dialog box, configure the method and time to push the report and the report format.

Table 10-2 Auto Send

Parameter	Description
Status	Whether to enable the auto send function. This function is disabled by default (○). ● ○: indicates that auto send function is disabled. ● ●: indicates that the auto send function is enabled. The operation report of the previous period will be sent to you through emails.

Parameter	Description
Send cycle	Interval at which a report is sent. ● By default, the report is sent at 00:00 on the specified date. ● Reports can be sent by the day, week, or month. ● Statistics in the daily reports are displayed by the hour. ● Statistics in the weekly reports are displayed by the day. ● Statistics in the monthly reports are displayed by the week.
File format	Format of the report. You can select only one format. ● DOC is selected by default. ● You can download a report in PDF, DOC, XLS, or HTML.

Step 5 Click **OK**.

----End

10.5 System Report

10.5.1 Viewing System Reports

As an audit administrator, you can view operation details in a system report. A system report usually includes the **UserControl Stat**, **User&Resource Stat**, **SrcIP Stat**, **Logon Stat**, **Exception Stat**, **Supervision Stat**, and **User Status** trend charts.

Constraints

- Each trend chart displays the statistics for a maximum of 180 consecutive days.
  - By default, the operation data of the current day is displayed by the hour.
  - Operation data over 30 days can only be viewed by the week or month.
  - Operation data within 30 days can be viewed by the day, week, or month.
- The trend chart can only be a bar chart.

Prerequisites

You have the management permissions for the **System Report** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **System Report**.

Step 3 Click each statistics tab and view the details.

----End

UserControl Stat

This area displays the number of disabling and enabling users. By default, the statistics of the current day is displayed.

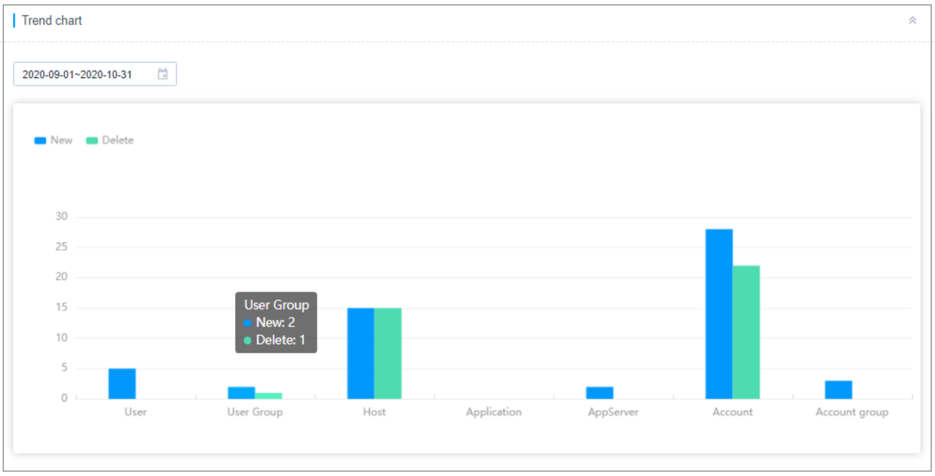
In the detailed data area, view the operation time, user login name, source IP address, operation, and operation results.

User&Resource Stat

This area displays statistics of how many users, user groups, hosts, application resources, application servers, accounts, and account groups are created and deleted. By default, the statistics of the current day is displayed.

In the detailed data area, view the operation time, user login name, source IP address, operation, and operation results.

Figure 10-16 Trend chart of User&Resource Stat



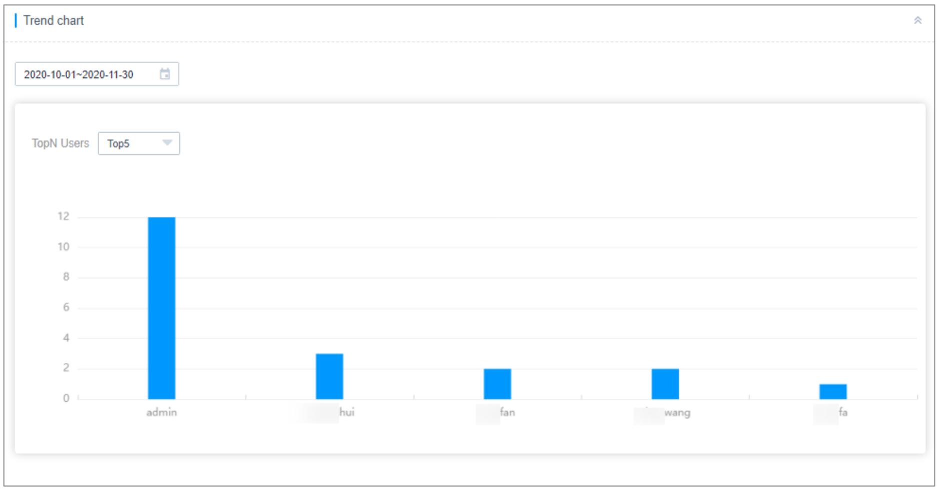
SrcIP Stat

This area displays the number of IP addresses from which users log in to the system. By default, the statistics of the current day is displayed.

You can view top 5, top 10, and top 20 source IP addresses.

In the detailed data area, view the logon time, source IP address, operation, and operation results.

Figure 10-17 Trend chart of SrcIP Stat



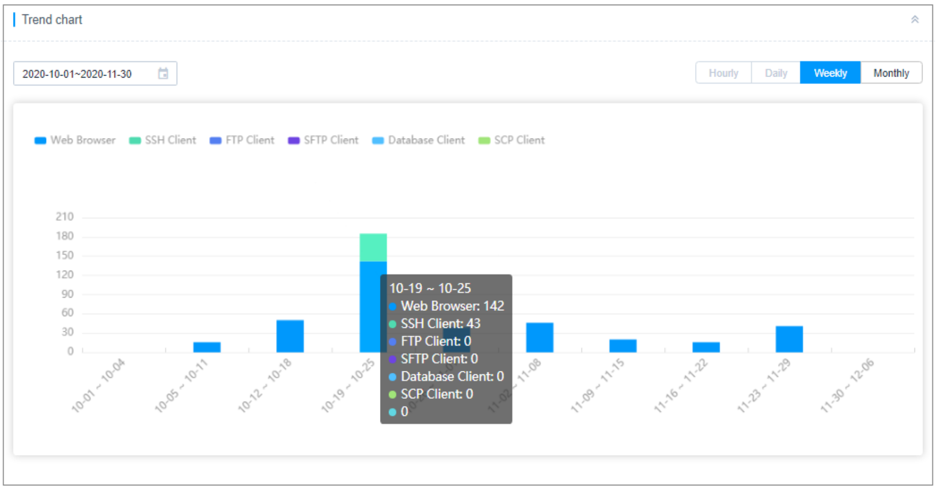
Logon Stat

This area displays the number of logins by login method. By default, the statistics of the current day is displayed.

You can view logins by web browsers and SSH, FTP, and SFTP clients.

In the detailed data area, view the logon time, source IP address, operation, and operation results.

Figure 10-18 Trend chart of Logon Stat



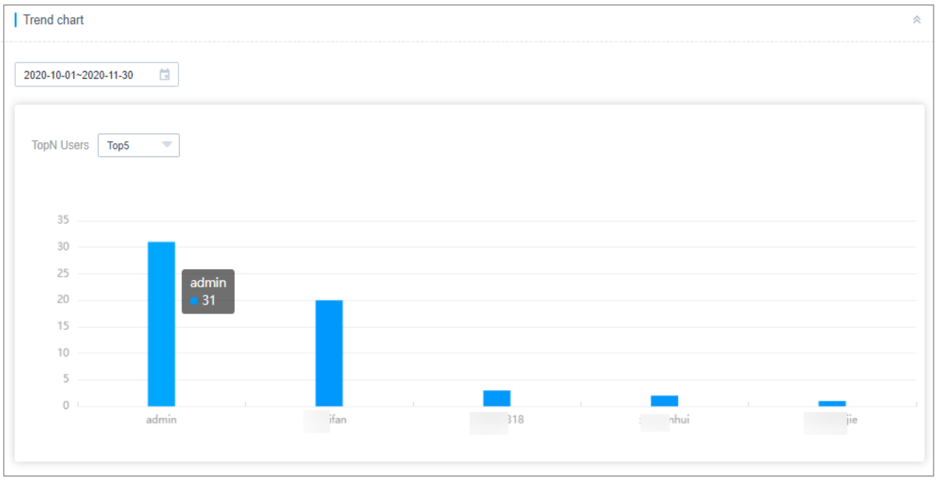
Exception Stat

This area displays the number of login exceptions. By default, the statistics of the current day is displayed.

You can view top 5, top 10, and top 20 login exceptions.

In the detailed data area, view the logon time, source IP address, operation, and operation results.

Figure 10-19 Trend chart of Exception Stat



Supervision Stat

This area displays the number of interrupted sessions and monitored sessions. By default, the statistics of the current day is displayed.

In the detailed data area, view the logon time, source IP address, operation, and operation results.

User Status

This area displays the number of zombie users and the number of users by password strength.

- Zombie users are valid users who have not logged in for more than 14 days. Zombie accounts are counted by the number of days during which they have not logged in.

  By default, information about top 5 zombie accounts is displayed. You can view top 5, top 10, and top 20 zombie users.

  In the detailed data area, view the time of the last successful login, source IP address, operation, and operation results.

- Password strength is classified into three levels: high, medium, and low.

  In the detailed data area, you can view the login name of the user who completes the last password change, password strength, and last password change time, which are displayed in ascending order by password strength.

  NOTE

  Password strength classification criteria:

  High: The password contains eight or more characters that include uppercase letters, lowercase letters, digits, and special characters.

  Medium: The password contains eight or more characters that include two or three types of the following characters: uppercase letters, lowercase letters, digits, and special characters.

  Low: The password contains fewer than eight characters or contains eight or more characters that include one type of the following characters: uppercase letters, lowercase letters, digits, or special character.

10.5.2 Pushing System Reports

For your convenience of audit, you can manually export the system reports or enable the auto send function to let the bastion host push system reports to you through emails at the interval you select.

- System reports can be automatically sent by the day, week, and month.
- The report format can be PDF, DOC, XLS, or HTML.
- A system report for a maximum of 180 consecutive days can be pushed each time.

Prerequisites

- You have the management permissions for the **System Report** module.
- You have configured an available email address to receive reports.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **System Report**.

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

Step 4 In the displayed **Export** dialog box, configure the method and time to export the report and the report format.

Table 10-3 Parameters for exporting system reports

Parameter	Description
Granularity	Time granularity for displaying the trend chart of the system report. The options are **Hourly**, **Daily**, **Weekly**, and **Monthly**.
Time	Start time and end time to generate the report to be exported. ● Start time and end time are mandatory. ● A maximum of 180 consecutive days are allowed.
Report Type	Type of statistics to be included in the report.
File format	Format of the report. You can select only one format. ● DOC is selected by default. ● You can download a report in PDF, DOC, XLS, or HTML.

Step 5 Click **OK** to export the system report immediately.

Step 6 Go to your email address to check the system report after you receive the notification in the message center.

----End

Automatically Pushing a System Report

Step 1 Log in to your bastion host.

Step 2 Choose **Audit** > **System Report**.

Step 3 On the displayed page, click **Auto Send** in the upper right corner.

Step 4 In the displayed **Auto Send** dialog box, configure the method and time to push the report and the report format.

Table 10-4 Parameters for auto-send function

Parameter	Description
Status	Whether to enable the auto send function. This function is disabled by default (○). ● ○: indicates that auto send function is disabled. ● ●: indicates that the auto send function is enabled. The operation report of the previous period will be sent to you through emails.
Send cycle	Interval at which a report is sent. ● By default, the report is sent at 00:00 on the specified date. ● Reports can be sent by the day, week, or month. ● Statistics in the daily reports are displayed by the hour. ● Statistics in the weekly reports are displayed by the day. ● Statistics in the monthly reports are displayed by the week.
File format	Format of the report. You can select only one format. ● DOC is selected by default. ● You can download a report in PDF, DOC, XLS, or HTML.

Step 5 Click **OK**.

----End

11 System Management

11.1 Sysconfig

11.1.1 System Configuration Overview

System configuration includes security, network, port, outgoing, authentication, ticket, alarm, audit, and HA backup. By default, only the system administrator **admin** has permissions to modify system configurations and manage the overall system running status.

- Security configuration: See **Login Security Management**.
- Network configuration: See **Network**.
- Port configuration: See **Port**.
- Outgoing configuration: See **Outgoing**.

  NOTE

  User Expiration Countdown Settings: If you configure this, you will receive an email five days before a user expires.
- Authentication configuration: See **Remote Authentication Management**.
- Ticket configuration: See **Ticket Configuration Management**.
- Alarm configuration: See **Alarm**.
- System theme: See **Theme**.

11.1.2 Network

11.1.2.1 View Network Configurations

This topic describes how to view the system network interface, DNS address, default gateway address, and static routes.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Network**.

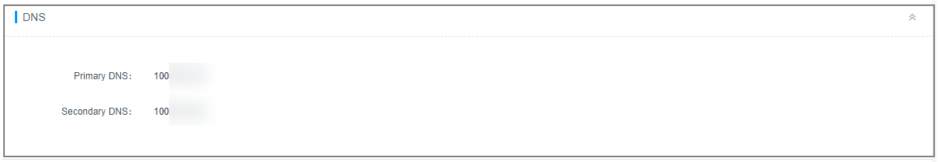
Step 3 In the **Network interfaces** area, view the network interface information of the bastion host.

By default, the network interfaces cannot be modified.

Step 4 In the **DNS** configuration area, view the primary and secondary DNS addresses of the bastion host.

By default, the DNS address cannot be changed.

Figure 11-1 System DNS address



DNS

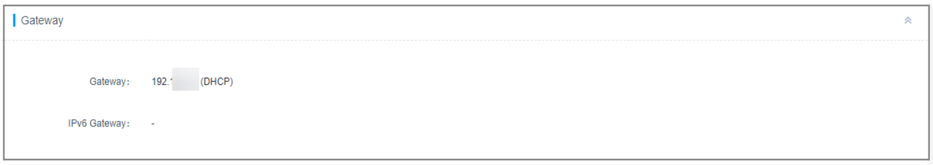
Primary DNS: 100[redacted]

Secondary DNS: 100[redacted]

Step 5 In the **Gateway** area, view the default gateway of the bastion host.

By default, the DHCP gateway address is identified as the system gateway. The default gateway cannot be changed.

Figure 11-2 System default gateway



Gateway

Gateway: 192.[redacted](DHCP)

IPv6 Gateway: -

Step 6 In the **Static Route** configuration area, view accessible servers in other network segments.

----End

11.1.2.2 Adding a Static Route to Your Bastion Host

After a bastion host restarts, non-static routes may be lost, affecting network availability. To prevent this issue, add static routes to the system.

This topic describes how to add a static route to a bastion host.

Prerequisites

You have the management permissions for the **System** module.

⚠ CAUTION

Each static route must be correct. If the information is incorrect, you cannot log in to your bastion host.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Network**.

Step 3 In the **Static Route** configuration area, click **Add**.

In the displayed **Add static route** dialog box, configure other parameters.

Step 4 Click **OK**. You can then go to the **Security** configuration page and view the configured static route.

----End

Follow-up Operations

To delete a static route, click **Delete** in the **Operation** column in the corresponding row.

11.1.3 HA

11.1.3.1 Enabling HA

A bastion host supports dual-node high availability (HA). After HA is enabled, the secondary node will take over the service if the primary node breaks down.

This topic describes how to enable dual-node HA backup.

Constraints

- The primary node must be configured first. After the primary node is configured and the configuration takes effect, configure the secondary node and ensure that the primary and secondary nodes use the internal network for HA synchronization configuration.
- After the HA configuration on the secondary node is complete, the historical data is cleared regardless of whether there is configuration data on the secondary node, and the configuration data of the primary node is synchronized to the secondary node.

Prerequisites

- You have the management permissions for the **System** module.
- You have prepared two bastion hosts, and both of them use the same license.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **HA**.

Step 3 View the HA status. By default, the HA status is **Disabled**.

⚠ CAUTION

If you purchase a primary/standby instance, do not disable HA, or logins will fail.

Step 4 Click **Enable** next to **Status**.

In the displayed **Enable HA** dialog box, configure the network information for the primary and secondary nodes.

Table 11-1 Parameters for enabling the HA function

Parameter	Description
Initial role	The working status of the node. This parameter can be set to **Primary node** or **Secondary node**. You need to configure the basion host that functions as the primary node first.
HA cluster authcode	The value is automatically generated by the system and is used for mutual verification between the primary and secondary nodes. ● When configuring HA parameters for the primary node, record the verification key of the HA group and configure the parameters for the secondary node accordingly. ● The value is a string consisting of 8 to 20 digits or letters.
Secondary node IP	When configuring HA parameters for the primary node, enter the IP address of the bastion host that functions as the secondary node.
Primary node IP	When configuring HA parameters for the secondary node, enter the IP address of the bastion host that functions as the primary node.
HA Key	When configuring HA parameters on the primary node, enter the key for mutual authentication between the primary and secondary nodes.
Float IP	Enter an unused IP address that is in the same network range as the fixed IP address of the current bastion host. A mask must be added to the end of the floating IP address. A floating IP address is the logical IP address of the two bastion hosts. When you access this IP address, you will automatically log in to one of the bastion hosts, usually the primary node.
Float IP Interface	Select the network interface where the fixed IP address of the bastion host is located.
HA Interface	This interface is the same as that of the floating IP interface.

Step 5 Click **OK** and then restart the system for the configuration to take effect.

----End

Effective Conditions

Restart the primary and secondary nodes for the HA configuration to take effect.

- Before the restart, the **Running Status** is **Standalone**, indicating that the configuration does not take effect.
- After the restart, the HA backup cannot take effect until the primary node discovers the IP address of the secondary node and the **Running Status** of the secondary node changes to **Online**.

Follow-up Operations

To disable the dual-node HA function, click **Disable** next to **Status** in each system.

Save the settings and restart the two bastion hosts. HA is disabled after the restart.

11.1.4 Port

11.1.4.1 Configuring the Operation Ports

The operation port is required for accessing managed resources, such as SSH, SFTP, or FTP resources, and logging in to a bastion host through SSH client. Different operation ports may be required for different types of resources. The default operation port is 2222.

If you change the default port, modify the security group configuration of the instance accordingly.

This topic describes how to configure an operation port.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Port**.

Step 3 In the **Operation Port** area, click **Edit**.

- Configure port for SSH/SFTP resources. The default port number is 2222.
- The FTP agent service is disabled by default. Enable the FTP agent service. The default port is 2121.

Step 4 Click **OK** and then restart the system for the configuration to take effect.

----End

11.1.4.2 Configuring the Web Console Port

The web console port is used for logging in to your bastion host through a web browser. The default port is 443.

If you change the default port, modify the port configured in the security group of the instance accordingly.

This topic describes how to configure a web console port.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Port**.

Step 3 In the **Web Console** area, click **Edit**.

In the displayed **Web Console** dialog box, configure the port for accessing the web browser. The default port is 443.

Step 4 Click **OK** and then restart the system for the configuration to take effect.

----End

11.1.4.3 Configuring the SSH Console Port

The SSH console port is required for logging in to your bastion host through an SSH client. The default port is 22.

If you change the default port, modify the port configured in the security group of the instance accordingly.

This topic describes how to configure an SSH console port.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Port**.

Step 3 In the **SSH Console** area, click **Edit**.

In the displayed **SSH Console** dialog box, configure the port for accessing the SSH client. The default port is 22.

Step 4 Click **OK** and then restart the system for the configuration to take effect.

----End

11.1.5 Outgoing

11.1.5.1 Configuring the Outgoing Mail Server

To send email notifications, such as password change plans and alarm messages, configure an outgoing mail server.

- You can set a private mailbox server or public mailbox server as required and test whether the entered server information is valid.
- Currently, two protocols are supported: SMTP and Exchange (only Exchange 2010).

This topic describes how to configure an outgoing mail server.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Outgoing**.

Step 3 In the **Email** area, click **Edit**.

In the displayed **Email** dialog box, set **Protocol** to **SMTP** or **Exchange** and specify other parameters.

Step 4 Click **OK**. You can then view email configuration on the **Outgoing** tab.

----End

11.1.5.2 Configuring the Outgoing SMS Gateway

SMS messages are mainly used to:

- Receive the mobile phone verification code for login authentication.
- Reset the password.
- Receive alarm messages. For details about the alarm scope, see **Alarm**.

Currently, you can select **Built-in** or **Third-party** SMS gateways. If you select **Third-party**, general **SMS Gateway** and cloud SMS gateway are available.

- If you do not need to push system alarms or send and receive SMS messages to mobile numbers outside the Chinese mainland, you can configure the SMS gateway by referring to **Built-in SMS gateway**.
- If you need to receive system alarms or send and receive SMS messages to mobile numbers outside the Chinese mainland, configure the SMS gateway by referring to **General Third-party SMS Gateway**.
- If you have purchased **Message & SMS** (MSGSMS) service, configure the SMS gateway by referring to **Third-Party Message & SMS Service**.

NOTE

- MSGSMS cannot push system alarms.
- If your cloud MSGSMS gateway becomes invalid, the system gateway automatically takes over the job.

This topic describes how to configure an outgoing SMS gateway.

Prerequisites

You have the management permissions for the **System** module.

Built-in SMS gateway

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Outgoing**.

Step 3 In the **SMS API** area, click **Edit**.

Step 4 Select **Built-in** and enter a mobile number to verify the connectivity of the built-in SMS gateway.

Step 5 Click **OK**. You can then view SMS gateway configuration on the **Outgoing** tab.

CAUTION

- The built-in SMS gateway cannot push system alarm notifications.
- The built-in SMS gateway cannot send SMS messages to mobile numbers outside the Chinese mainland. If you need to receive SMS messages from mobile numbers outside the Chinese mainland globally, configure an SMS gateway globally.

----End

General Third-party SMS Gateway

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Outgoing**.

Step 3 In the **SMS API** area, click **Edit**.

Step 4 Select **Third-party** and then select **SMS Gateway** from the **SMS Conf** drop-down list.

In the displayed parameter list, specify other parameters as prompted.

Step 5 Click **OK**. You can then view SMS gateway configuration on the **Outgoing** tab.

Table 11-2 SMS API parameters

Parameter	Description
Method	Request method. The options are **POST** and **GET**.
URL	URL of SMS API. You can enter a universal URL or a URL containing parameters. Do not enter MD5-encrypted URLs.
HTTP Header	HTTP request header. Use colons (:) to separate the name and value of the HTTP request header. Only HTTP and HTTPS gateways are supported.
API Params	API parameters of the SMS gateway. Replace keywords *$MOBILE* and *$TEXT* with the phone number and SMS content.
Encode	Encode method. You can select **UTF-8**, **Big5**, or **GB18030**.
Mobile	Phone number for receiving the SMS messages. Enter an available phone number and verify the SMS message content.

----End

Third-Party Message & SMS Service

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Outgoing**.

Step 3 In the **SMS API** area, click **Edit**.

Step 4 Select **Third-party** and then configure MSGSMS for SMS gateway.

Select the Chinese SMS gateway or international SMS gateway as required.

Step 5 Click **OK**. You can then view SMS gateway configuration on the **Outgoing** tab.

Table 11-3 Cloud SMS gateway parameters

Parameter	Description
APP_Key	The key of the SMS application.
APP_Secret	The secret of the SMS application.
Application Access URL.	Access URL of the SMS application.
Sender	Channel number before the SMS message. To get this number, apply for your SMS signature first.
Template ID	ID of requested SMS template.

Parameter	Description
Mobile	Phone number for receiving the SMS messages. Enter an available phone number and verify the SMS message content.

----End

11.1.5.3 Configuring LTS

You can use Log Tank Service (LTS) to manage operation logs in the bastion host.

Prerequisites

- You have the management permissions for the **System** module.
- You have enabled Log Tank Service (LTS).
- An EIP has been bound to the bastion host.

Constraints

- An EIP must be bound to the bastion host.
- Log Tank Service (LTS) must be enabled before you configure LTS in your bastion host.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Outgoing**.

Step 3 On the displayed page, locate the **LTS Config** area and click **Edit**.

Step 4 Click ⬭ to enable LTS and enter the installation instruction in the **Install Agent** text box.

Click ⓘ to view how to obtain the installation instruction.

Step 5 Click **OK**.

----End

11.1.6 Alarm

11.1.6.1 Configuring Alarm Channels

You can enable alarm notification on messages of a certain severity level. There are five types of alarm messages, including system messages, service messages, task messages, command alarms, and ticket messages. All messages are classified into high, medium, and low severity levels.

- Alarm notifications can be sent through message center, emails, or SMS message.
- Whether to report an alarm for a message and which alarm channel is used vary depending on severity level of the message. By default:

- For messages of low severity, no alarms are sent.
- For messages of medium severity, alarms are sent through the message center.
- For messages of high severity, alarms are sent through the message center and emails.

This topic describes how to configure the alarm channels.

Constraints

Alarm notifications can be pushed through SMS messages only after you enable the SMS APIs.

Prerequisites

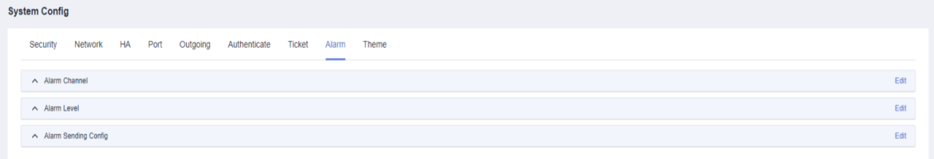
You have the management permissions for the **System** module.

Alarm

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Alarm**.

Figure 11-3 Alarm



Step 3 In the **Alarm Channel** area, click **Edit**.

In the displayed **Alarm Channel** dialog box, set alarm channels for different message types.

Step 4 Click **OK**. You can then view alarm level configuration on the **Alarm** tab.

----End

11.1.6.2 Configuring Alarm Levels

This topic describes how to configure the alarm levels of messages.

Prerequisites

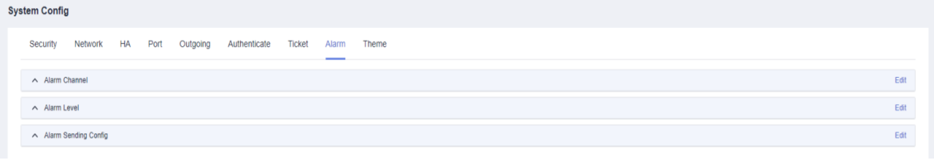
You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Alarm**.

Figure 11-4 Alarm



Step 3 In the **Alarm Level** area, click **Edit**.

- In the displayed **Alarm Level** dialog box, configure alarm severity levels for different types of messages in each tab.
- The alarm level can be high, medium, or low.

Step 4 Click **OK**. You can then view alarm level configuration on the **Alarm** tab.

----End

11.1.6.3 Configuring Alarm Sending

This section describes how to configure the alarm sending scope.

Prerequisites

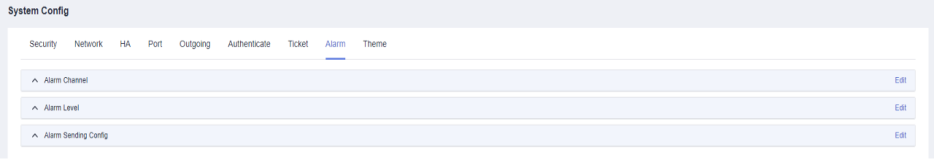
You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Alarm**.

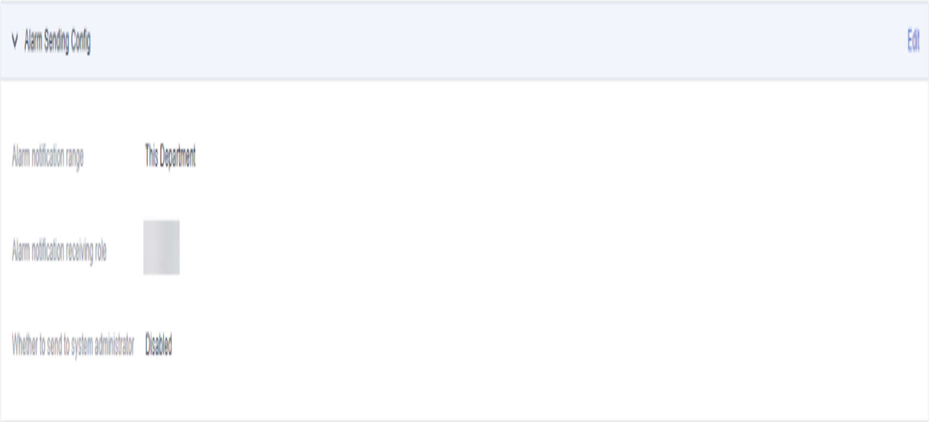
Figure 11-5 Alarm



Step 3 In the **Alarm Sending Configuration** area, click **Edit**.

- Select **This Department** or **The department and all superior departments** to which the alarm notification is sent based on the alarm notification range.
- Alarm notifications can be sent to system administrators. You can determine whether to send alarm notifications as needed.

Figure 11-6 Alarm sending configurations



Alarm Sending Config

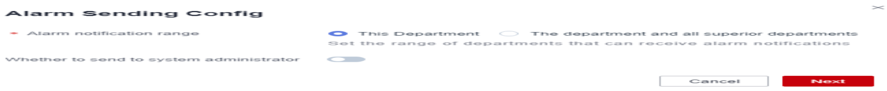
Alarm notification range: This Department

Alarm notification receiving role

Whether to send to system administrator: Disabled

Step 4 Click **OK**. You can then view alarm sending configuration on the **Alarm** tab.

Figure 11-7 View the alarm sending configurations.



Alarm Sending Config

* Alarm notification range: ● This Department ○ The department and all superior departments

Set the range of departments that can receive alarm notifications

Whether to send to system administrator

----End

11.1.7 Theme

11.1.7.1 Changing the System Theme

This topic describes how to change the system language and customize system and company logos.

Prerequisites

You have the management permissions for the **System** module.

Theme

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Sysconfig** > **Theme**.

Step 3 Switch over the system language.

1. On the displayed page, in the **Language settings** area, click **Edit**.
2. Select a language. You can select simplified Chinese or English.
3. Click **OK**.

   Then, log out the system, clear cookies, and log in to it again for the specified language to take effect.

   NOTE

   Changing language in the upper right corner on the login page takes effect immediately.

Step 4 Change the system icon.

1. In the **Logo settings** area, click **Edit**.
2. Click logos under **System logo** and **Company logo**, respectively, open the local path, and select a logo you want to use.
3. Click **OK** and then restart the system for the configuration to take effect.

----End

11.2 Data Maintenance

11.2.1 Viewing System Memory

The storage space of a bastion host consists of system partitions and data partitions. If the idle space of the data partition is insufficient, delete historical system data.

This topic describes how to check the system memory usage.

Prerequisites

You have the management permissions for the **System** module.

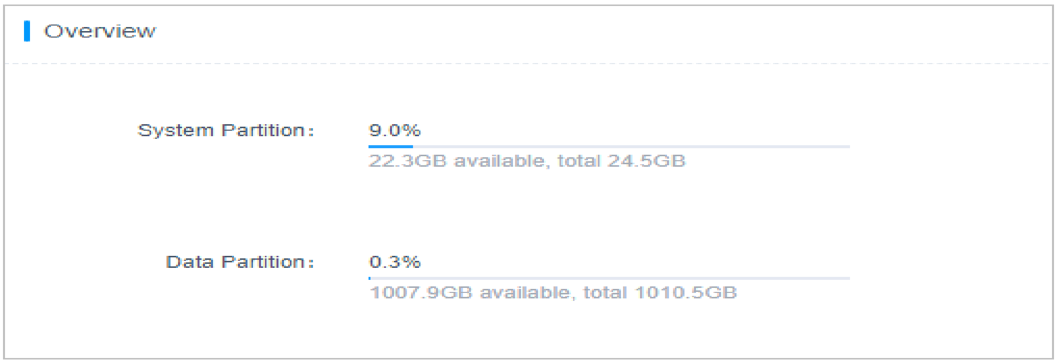
Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Data Maintain** > **Storage Mgmt**.

Step 3 In the **Overview** area, view the space usage of the system partition and data partition.

Figure 11-8 Storage space overview



Overview

System Partition: 9.0%
22.3GB available, total 24.5GB

Data Partition: 0.3%
1007.9GB available, total 1010.5GB

----End

11.2.2 Configuring the Netdisk Capacity

The **Netdisk** is used to temporarily store files from managed hosts or the local server for the purpose of file transfer. The **Netdisk** is a personal net disk in a bastion host.

This topic describes how to set the net disk capacity.

Constraints

- The maximum available space of the net disk is the available space of the system data disk.
- After **Personal Netdisk** is set, the bastion host allocates the same personal net disk capacity for each user in the system.
- Files on the **Netdisk** can only be manually deleted. Periodic clearance of personal net disk space is not supported.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Data Maintain** > **Storage Mgmt**.

Step 3 In the **Netdisk** area, click **Edit**. In the displayed dialog box, set the disk size.

Table 11-4 Netdisk parameters

Parameter	Description
Personal Netdisk	A private disk exclusively used by the current user ● The default value is **100 MB**. ● To use the personal net disk unlimitedly when the system data disk capacity is allowed, set **Personal Netdisk** to **0**.
Total Netdisk	Total netdisk capacity. ● The default value is **5120 MB**. ● To use all space of the total net disk unlimitedly when the system data disk capacity is allowed, set **Total Netdisk** to **0**.

Step 4 Click **OK**. You can then view capacity of the configured **Personal Netdisk** and **Total Netdisk** on the **Storage Mgmt** tab.

Step 5 Click **Detail** and view details about the net disk.

Step 6 In the row containing the net disk, click **user.button.deleteNetDiskData** in the **Operation** column.

NOTE

You can also select all net disks from which you want to delete data and click **user.button.deleteNetDiskData** to clear the disks together.

----End

11.2.3 Deleting System Data

If the system data disk usage is higher than 95%, the system may become unavailable. To ensure that the system data disk can be used properly, you can configure automatic or manual deletion of system data by referring to this section.

The system data that is automatically or manually deleted is mainly the files temporarily stored on the data disk, including large historical session video files, local backup log files, and local backup system configuration files.

⚠ DANGER

Deleted system data cannot be restored. Exercise caution when performing this operation.

Constraints

Data of a specific day cannot be deleted through **Manual Deletion**. You can delete the data before the date you select.

Prerequisites

You have the management permissions for the **System** module.

Configuring Auto Deletion

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Data Maintain** > **Storage Mgmt**.

Step 3 In the **Auto Deletion** area, click **Edit**. In the displayed dialog box, set related parameters.

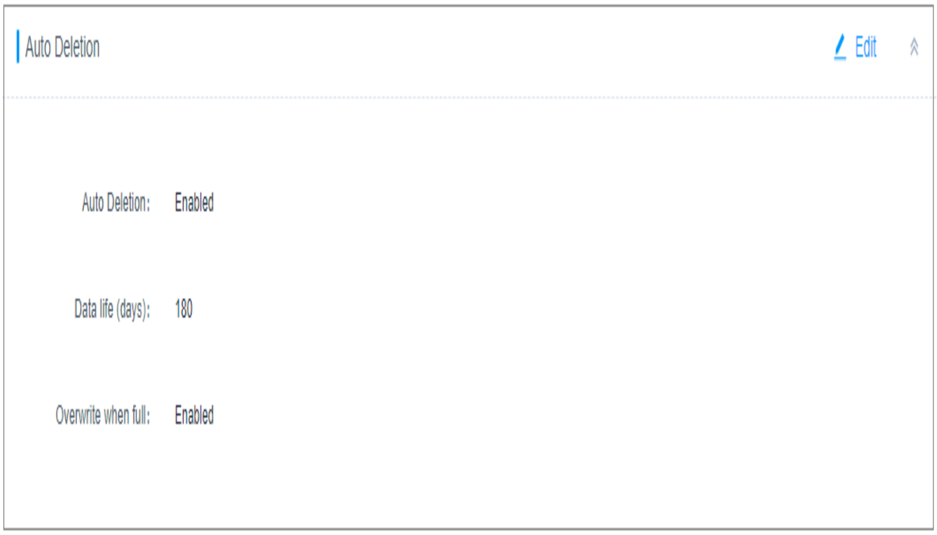
Table 11-5 Configuring Auto Deletion

Parameter	Description
Auto Deletion	Status of auto deletion (default: ◉). ● ◉: Auto deletion is enabled. The system automatically starts the data deletion job when the data storage duration and data disk usage exceeds the limit. ● ○: Auto deletion is disabled.
Data life (days)	Data storage duration. The data is automatically deleted when its storage duration exceeds the specified value. ● Default value: **180** days. ● Value range: **1** to **10000**, in days.

Parameter	Description
Overwrite when full	When the data disk usage exceeds 90%, data on the disk will be automatically deleted. Whether to enable this function (default:). ● : This function is disabled ● : This function is enabled. ● Auto deletion policies: – The system checks the data disk usage every 30 minutes. When the usage is lower than 90%, the auto deletion stops. – By default, the system deletes data generated 180 days earlier than the current day. – If the data disk usage is still higher than 90%, the rest data is deleted day by day backwards from the day before the current day until the space usage is lower than 90% – Data of the current day cannot be automatically deleted.
Delete Content	The options are as follows: ● System Log ● Session Log

Step 4 Click **OK**.

Figure 11-9 Auto Deletion



Auto Deletion

Auto Deletion: Enabled

Data life (days): 180

Overwrite when full: Enabled

----End

Manual Deletion

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Data Maintain** > **Storage Mgmt**.

Step 3 In the **Manual Deletion** area, select a date.

Step 4 Click **Delete**. Data generated before the selected date is deleted.

----End

11.2.4 Creating a Local Data Backup

To enhance data disaster recovery management and improve audit data security and system scalability, you can back up configuration logs for your bastion host.

This topic walks you through how to create a backup locally.

Constraints

- Supported logs: System login logs, resource login logs, command operation logs, file operation logs, and two-person authorization logs
- After a local backup is created, a log file is generated on the system data disk.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Data Maintain** > **Log Backup**.

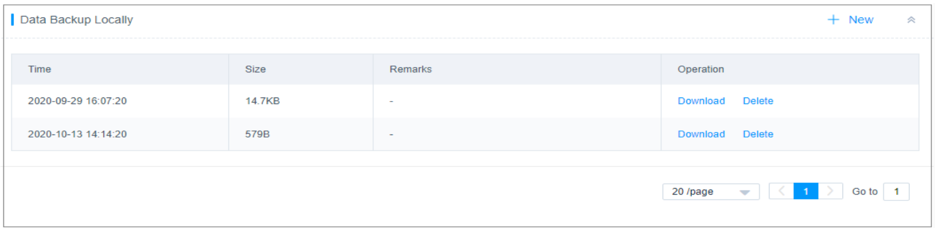
Step 3 In the **Data Backup Locally** area, click **Add**. In the displayed dialog box, configure backup content and date range.

Table 11-6 Creating a Local Backup

Parameter	Description
Log content	Type of logs to be backed up ● The options are **System Login**, **Resource Logon**, **Command log**, **File log**, and **Double auth log**. ● Select at least one log type.
Date Range	Date range to generate logs to be backed up ● Select at least one day.
Remarks	Brief description. ● A maximum of 128 characters can be entered.

Step 4 Click **OK**. You can then view the backup information on the **Log Backup** tab.

Figure 11-10 Data Backup Locally



Data Backup Locally

Time	Size	Remarks	Operation
2020-09-29 16:07:20	14.7KB	-	Download Delete
2020-10-13 14:14:20	579B	-	Download Delete

----End

Follow-up Operations

- To download a local backup to your local server, click **Download** in the **Operation** column of the corresponding row.
- To delete a local backup, click **Delete** in the **Operation** column of the corresponding row.

11.2.5 Configuring the Syslog Server for Remote Backup

To enhance data disaster recovery management and improve audit data security and system scalability, you can back up configuration logs for your bastion host.

This topic walks you through how to configure the Syslog server for remote log backup.

Constraints

- After remote backup is enabled, the system backs up the system data of the previous day at 00:00 every day by default.
- Logs are automatically backed up on a daily basis and uploaded to the corresponding folder on the Syslog server.
- Supported logs: System login logs, resource login logs, command operation logs, file operation logs, and two-person authorization logs

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Data Maintain** > **Log Backup**.

Step 3 In the **Backup to the syslog server** area, click **Edit**. In the displayed dialog box, complete required parameters.

Table 11-7 Parameters for configuring the Syslog server

Parameter	Description
Status	Whether to back up data to the Syslog server (default: ○). ● ●: This function is enabled. The system automatically starts backup at 00:00 every day. ● ○: This function is disabled.
Sender Identifier	Identifier for connecting your bastion host to the Syslog server. The identifier is used to identify the bastion host from which the logs are received on the Syslog server.
Server IP	IP address of the Syslog server.
Port	Port number of the Syslog server.
Protocol	Protocol of the Syslog server. ● The options are **TCP** or **UDP**. ● If **TCP** is selected, click **Test connectivity** to check whether the server is reachable.
Backup Content	Select at least one type of logs to be backed up. ● System logon log ● Resource logon log ● Command operation log ● File operation log ● Two-person authorization log

Step 4 Click **OK**. You can then view the backup information on the **Log Backup** tab.

After the configuration is complete, the system backs up the data of the previous day at 00:00 every day and uploads the data to the remote Syslog server.

----End

Follow-up Operations

- To disable the Syslog server backup, click **Edit**. In the displayed dialog box, set **Status** to **Disabled**.
- To view or download logs backed up to the Syslog server, log in to the Syslog server.

11.2.6 Configuring an FTP/SFTP Server for Remote Log Backup

To enhance data disaster recovery management and improve audit data security and system scalability, you can back up configuration logs for your bastion host.

This topic walks you through how to configure the FTP or SFTP server for remote log backup.

Constraints

- After remote backup is enabled, the system backs up the system data of the previous day at 00:00 every day by default.
- Logs are automatically backed up on a daily basis and uploaded to the corresponding folder on the FTP or SFTP server.
- Logs of the same day cannot be backed up repeatedly in the same server path.
- System configuration and session playback logs can be remotely backed up to the FTP or SFTP server.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Data Maintain** > **Log Backup**.

Step 3 In the **Backup to the FTP/SFTP server** area, click **Edit**. In the displayed dialog box, complete required parameters.

Table 11-8 Parameters for configuring the FTP or SFTP server

Parameter	Description
Status	Whether to back up data to the FTP or SFTP server (default: ○). - ●: Remotely backing up logs to an FTP or SFTP server is enabled. The system automatically starts backup at 00:00 every day. - ○: Remotely backing up logs to an FTP or SFTP server is disabled.
Protocol	Protocol over which logs are transferred for backing up - The options are **FTP** and **SFTP**.
Server IP	IP address of the FTP or SFTP server.
Port	Port number of the FTP or SFTP server.
Username	Username on the FTP or SFTP server to test whether the FTP or SFTP server is reachable.
Password	Password of the username on the FTP or SFTP server to test whether the FTP or SFTP server is reachable.

Parameter	Description
Storage Path	Path where the logs are stored. ● The path must start with a period (.). For example, if the path is **./test/abc**, the absolute path is **/home/*username*/test/abc**. ● If this parameter is left empty, the backup content is stored in the home directory of the FTP or SFTP server user, for example, absolute path /home/*username*.
Test connectivity	Tests whether the configured FTP or SFTP server is reachable. ● It checks only the network status between the bastion host and the FTP or SFTP server. The user account of the server is not verified.
Backup Content	Select at least one type of logs to be backed up. ● System configuration ● Session recording playback log ● System logon log ● Resource logon log ● Command operation log ● File operation log ● Two-person authorization log

Step 4 Click **OK**. You can then view the backup information on the **Log Backup** tab.

After the configuration is complete, the system backs up the data of the previous day at 00:00 every day and uploads the data to the remote FTP or SFTP server.

----End

Follow-up Operations

- To back up the logs of a certain day immediately, start the remote backup immediately.

  In the **Backup to FTP/SFTP server** area, select the date of the logs to be backed up and click **Backup**.
- To disable the FTP or SFTP server backup, click **Edit**. In the displayed dialog box, set **Status** to **Disabled**.
- To view or download logs backed up to the FTP or SFTP server, log in to the FTP or SFTP server.

11.2.7 Configuring OBS Buckets for Remote Log Backup

To enhance data disaster recovery management and improve audit data security and system scalability, you can back up configuration logs for your bastion host.

This topic walks you through how to set OBS buckets to remotely back up logs.

Constraints

- After remote backup is enabled, the system backs up the system data of the previous day at 00:00 every day by default.
- Logs are automatically backed up on a daily basis and uploaded to the corresponding folder in the OBS bucket.
- Logs of the same day cannot be backed up repeatedly in the same server path.
- System configuration and session playback logs can be remotely backed up to OBS buckets.

Prerequisites

- You have the management permissions for the **System** module.
- You have created an OBS bucket, and the network between the OBS bucket and your bastion host is normal.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **Data Maintain** > **Log Backup**.

Step 3 In the **Remote Backup To OBS** area, click **Edit**. In the displayed dialog box, set bucket parameters.

Table 11-9 Parameters for remote backup to OBS

Parameter	Description
Status	Whether to back up logs to an OBS bucket (default: ○). ● ●: Backing up logs to OBS buckets is enabled. The system automatically starts backup at 00:00 every day. ● ○: Backing up logs to OBS buckets is disabled.
Access Key ID	Specifies the access key ID, which is used to verify the identity of the request sender for accessing the OBS bucket. An access key ID is a unique identifier associated with a secret access key and is used together with the secret access key to sign requests cryptographically. Obtain **Access Keys**.
Secret Access Key	Specifies the secret access key used together with the access key ID. A secret access key works as a cryptographic signature to identify the sender of a request and prevent the request from being tampered with.

Parameter	Description
EndPoint	Region where the bucket is located. **View bucket information** to obtain the endpoint of OBS in the region.
bucket	Bucket name.
Storage Path	Bucket path or bucket folder path. The path cannot contain three or more consecutive slashes (/). If the OBS bucket does not have the corresponding path, a folder is automatically generated in the bucket. Example: cbh/bastion/.../...
Test connectivity	Tests whether the network between your bastion host and the configured OBS bucket is reachable. The connectivity test checks only the network status between the bastion host and the OBS bucket.
Backup Content	Select at least one type of logs to be backed up. ● System configuration ● Session recording playback log ● System logon log ● Resource logon log ● Command operation log ● File operation log ● Two-person authorization log

Step 4 Click **OK**. You can then view the backup information on the **Log Backup** tab.

After the configuration is complete, the system backs up the data of the previous day at 00:00 every day and uploads the data to the OBS bucket.

----End

Follow-up Operations

- To back up the logs of a certain day immediately, start the remote backup immediately.

  In the **Remote Backup To OBS** area, select the date of the logs to be backed up and click **Backup**.
- To disable the remote OBS bucket backup, click **Edit**. In the displayed dialog box, set **Status** to **Disabled**.
- To view or download logs backed up to the OBS bucket, log in to the OBS console and perform operations in the corresponding bucket folder.

11.3 System Maintenance

11.3.1 Viewing System Status

To keep your bastion host stay healthy, you can keep an eye on the CPU, memory, disk, and network bandwidth usage in a timely manner.

This topic describes how to check the system CPU, disk, and network bandwidth usage.

Prerequisites

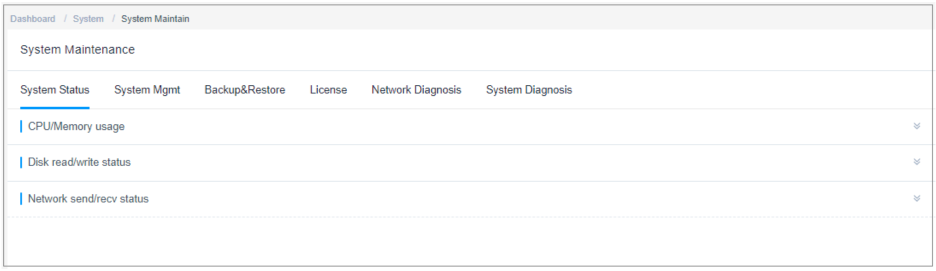
You have the management permissions for the **System** module.

Viewing System CPU and Memory Usage

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **System Maintain** > **System Status**.

Figure 11-11 Viewing System Status



Step 3 Expand the **CPU/Memory usage** area and view the CPU or memory usage.

- View CPU or memory usage statistics over the past 5 minutes, 15 minutes, or 1 hour.
- To view CPU or memory usage at a certain moment, move your cursor over the time point.

----End

View Disk Read/write Status

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **System Maintain** > **System Status**.

Step 3 Expand the **Disk read/write status** area and view the read/write usage of the system disk.

- View disk read/write statistics over the past 5 minutes, 15 minutes, or 1 hour.
- To view disk read/write speed at a certain moment, move your cursor over the time point.

----End

Viewing Network Sending and Receiving Status

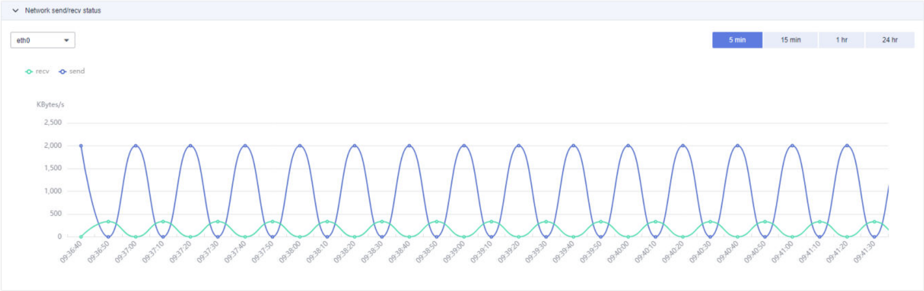
Step 1 Log in to your bastion host.

Step 2 Choose **System** > **System Maintain** > **System Status**.

Step 3 Expand the **Network send/recv status** area and view the system network receiving or sending status.

- View network packet receiving and sending speed over the past 5 minutes, 15 minutes, 1 hour, or 24 hours.
- View the sending and receiving status on the **eth0** and **eth1** network interfaces.
- To view network sending or receiving speed at a certain moment, move your cursor over the time point.

Figure 11-12 Network sending and receiving status



----End

11.3.2 System Mgmt

This topic describes how to update the system IP address, time, and version, how to restart, shut down, and restore the system, and how to manage the basic system information and status.

Prerequisites

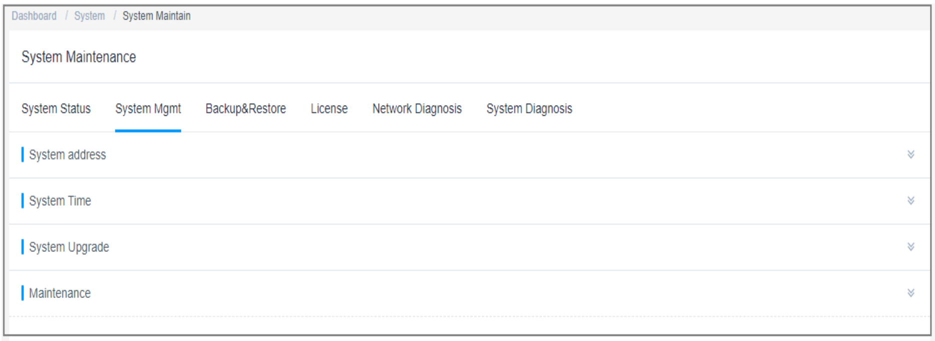
You have the management permissions for the **System** module.

Managing System Addresses

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **System Maintain** > **System Mgmt**.

Figure 11-13 System Mgmt

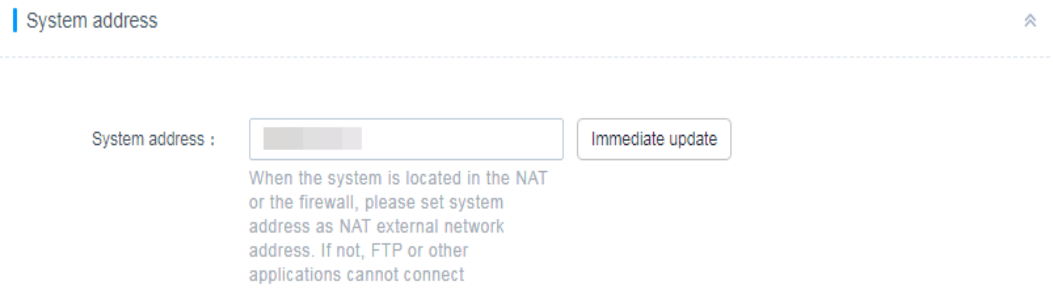


Step 3 Expand the **System address** area.

Step 4 Update the system IP address.

- After the EIP bound to the mapped bastion host is changed, update the system IP address accordingly.
- The system IP address must be the NAT external network address. Otherwise, application resources such as FTP cannot be connected.

Figure 11-14 System address



System address

System address : [redacted]

Immediate update

When the system is located in the NAT or the firewall, please set system address as NAT external network address. If not, FTP or other applications cannot connect

----End

Managing System Time

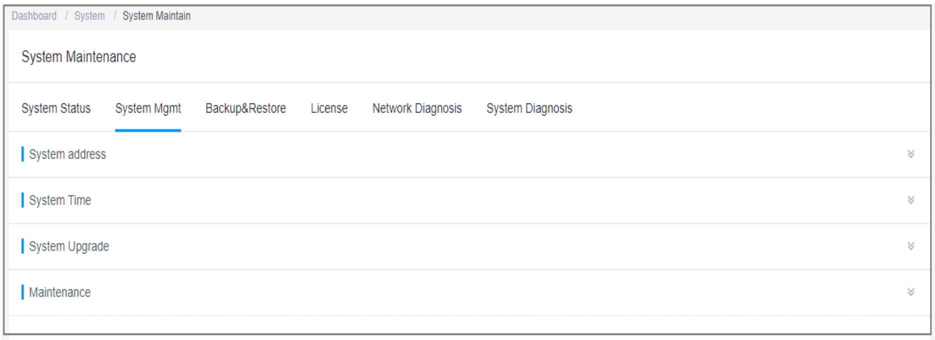
NOTE

Incorrect system time will make policies and tickets ineffective and causes failures in the authentication of the mobile OTP and dynamic OTP token when they bound to the bastion host.

Step 1 Log in to your bastion host.

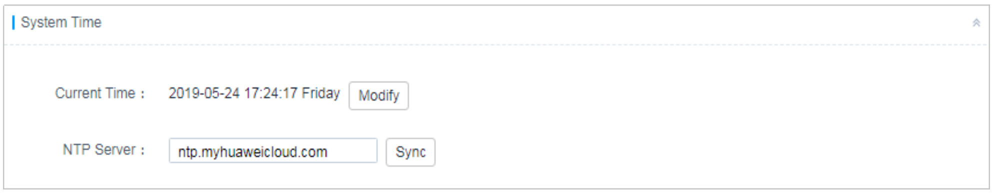
Step 2 Choose **System** > **System Maintain** > **System Mgmt**.

Figure 11-15 System Mgmt



Step 3 Expand the **System Time** area.

Figure 11-16 System Time



System Time

Current Time : 2019-05-24 17:24:17 Friday Modify

NTP Server : ntp.myhuaweicloud.com Sync

Step 4 Update the system time manually.

1. Click **Modify** next to the **Current Time**.
2. In the displayed **Edit System Time** dialog box, specify the date and time.
3. Click **OK**.

Step 5 Synchronize time from the NTP server.

The current system time is synchronized by default.

1. Select the built-in NTP server or enter the IP address of the NTP server.
2. Click **Sync**.

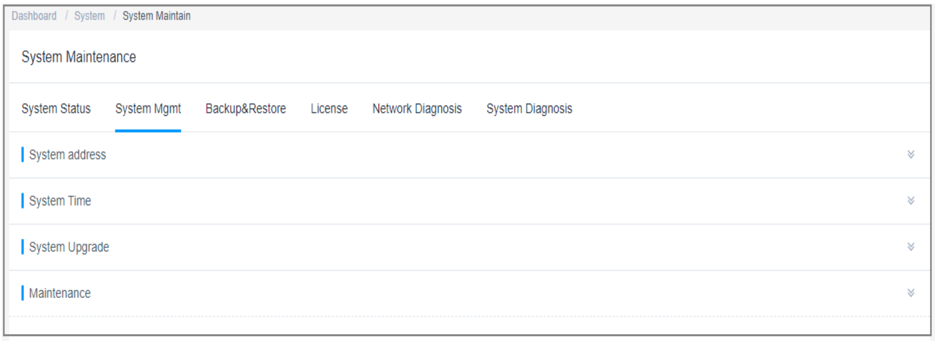
----End

Managing System Version

Step 1 Log in to your bastion host.

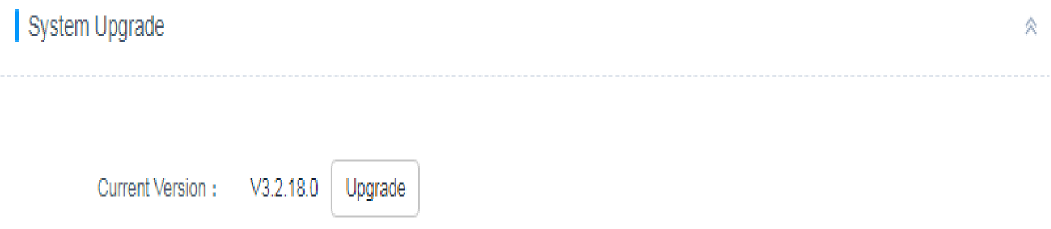
Step 2 Choose **System** > **System Maintain** > **System Mgmt**.

Figure 11-17 System Mgmt



Step 3 Expand the **System Upgrade** area.

Figure 11-18 System Upgrade



Step 4 Upgrade system version.

1. Before the upgrade, you need to verify the SHA 256 value of the upgrade package provided by Huawei.
2. Click **Upgrade**, open the local directory, and select and upload the upgrade package.
3. After the package is uploaded, its version number is displayed. Click **OK** to start the upgrade.

4. Wait for the system to automatically restart, which takes about 5 minutes. After the system is restarted, the upgrade is complete.
5. Log in to the system again and choose **System** > **About System** to check the device version.

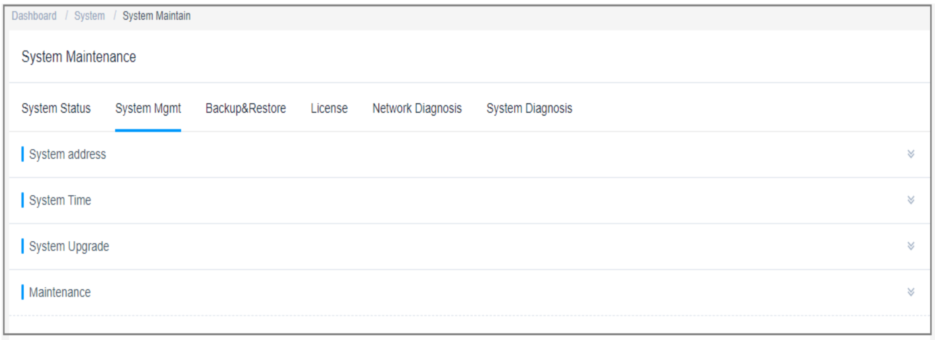
----End

Managing System Tools

Step 1 Log in to your bastion host.

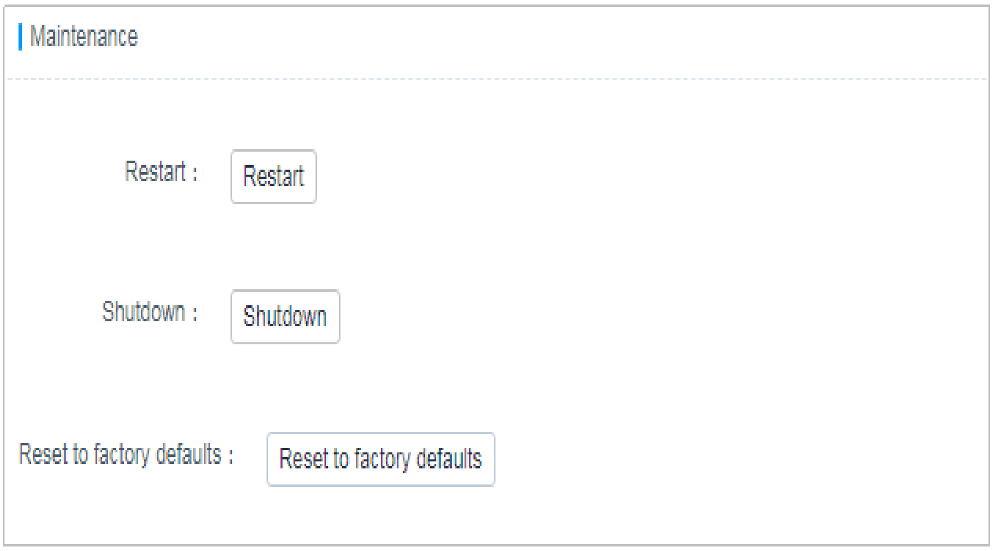
Step 2 Choose **System** > **System Maintain** > **System Mgmt**.

Figure 11-19 System Mgmt



Step 3 Expand the **Maintenance** area. In this area, you can restart and upgrade the system and restore the system to factory settings.

Figure 11-20 Maintenance



- Restarting the system

NOTE

To restart a bastion host, restarting it on the management console is recommended. For details, see **Restarting a Bastion Host Instance**.

a. Click **Restart**.

b. In the displayed confirmation dialog box, click **OK**.

c. Enter the password of system administrator **admin**.

d. Click **OK**. After the verification is successful, you can log in to the system.

- Shutting down the system

  NOTE

  To stop a bastion host, stopping it on the management console is recommended. For details, see **Stopping a Bastion Host Instance**.

  a. Click **Shutdown**.

  b. In the displayed confirmation dialog box, click **OK**.

  c. Enter the password of system administrator **admin**.

  d. Click **OK**.

- Restoring factory settings

  a. Click **Reset to factory defaults**.

  b. In the displayed confirmation dialog box, click **OK**.

  c. Enter the password of system administrator **admin**.

  d. Click **OK**. After the verification is successful, the system is restored to the initial settings, and all system data is cleared.

  DANGER

  Do not restore factory settings unless in emergencies. Otherwise, all system data will be lost.

----End

11.3.3 System Configuration Backup and Restoration (Backup&Restore)

To ensure that the system configuration data is not lost, enable the automatic backup function or periodically back up the system configuration data.

This section describes how to back up and restore system configurations and how to manage the backup files

The backup files ares stored on your bastion host. So they will use some of space. You can check the backup file size by date in the backup list.

Constraints

- A system configuration backup file can only be used for the bastion host that generates it.
- Only system configuration parameters can be backed up. System data generated during O&M cannot be backed up. For details about system data backup, see **Data Maintenance**

Prerequisites

You have the management permissions for the **System** module.

Backing Up System Configuration Data

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **System Maintain** > **Backup&Restore**.

Step 3 Enable auto backup.

In the **Config Backup** area, enable **Auto**. The system will automatically back up the configuration at 00:00 every day.

Step 4 Start a backup job immediately.

1. In the **Config Backup** area, click **New**.
2. In the displayed dialog box, enter remarks to distinguish backup files.
3. Click **OK** to start the backup. After the backup is complete, you can view the backup file in the backup list.

----End

Restoring System Configurations

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **System Maintain** > **Backup&Restore**.

Step 3 Restore the system configuration. Select any of the following methods:

- One-click system configuration restoration

  Before your start, ensure that a system configuration backup file is ready.

  a. In the **Config Backup** area, select the backup file you want to use.

  b. In the **Operation** column, click **Restore**.

- Using a local backup file to restore system configurations

  a. In the **Config Restore** area, click **Upload**.

  b. In the displayed dialog box, select a backup configuration file that has been downloaded.

  c. After the backup file is uploaded, click **OK**.

Step 4 Refresh the page. After the system is restored, you are required to log in to the system again.

----End

Managing Backup Files

You can download and delete system configuration backup files to save more storage space.

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **System Maintain** > **System Status**.

Step 3 Download a backup file.

1. In the **Config Backup** area, select the backup file you want to use.
2. In the **Operation** column, click **Download** to download the backup file.

Step 4 Delete a backup file.

1. In the **Config Backup** area, select the backup file you want to use.
2. In the **Operation** column, click **Delete** to delete the backup file to release storage space.

----End

11.3.4 License

When the system license is about to expire or the system specifications are upgraded, the system administrator can renew the instance, obtain a new license file, and update the license.

This topic walks you through how to view system license.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **System Maintain** > **License** and view the current license information.

Table 11-10 License parameters

Parameter	Description
Customer Info	Region and AZ where the system is used
Authentication Type	By default, **Official Version** is set for **Authentication Type**.
Status	**Activated**: The license can be used normally. ● Click **Update License**, download the license application file as prompted, and contact the vendor to apply for a license. Import the new license to update the license. ● Click **Backup License** to download the current system license to your PC. **NOTE** When the numbers of assets, users, and concurrent requests increase, you can update the license to upgrade the system specifications. In this case, adjust the CPU, memory, and bandwidth configurations of your bastion host.

Parameter	Description
Product ID	Product ID of the current system
Authorized Modules	Supported function modules. The function modules available depend on the edition you are using. We provided standard editions and professional editions. ● Standard editions: include only basic modules. ● Professional editions: include basic modules, **automatic O&M**, and **database audit**. – Automatic O&M includes the **Sync Rules**, **Script**, **Fast Operation**, and **OM Task** modules, as well as the configuration backup function. – Database audit allows you to audit database logs and operation commands. To this end, add databases to your bastion host and install local database tools for the bastion host to access databases.
Max Resources	Maximum number of resources that can be added to a bastion host (including host and application resources)
Max Concurrent Conns	Maximum number of connections established to host and application resources at the same time over different protocols. This number is the result of the number of logged users multiply by the number of logged in resources.

----End

11.3.5 Network Diagnosis

If a managed host fails to be logged in, you can quickly check the network between the bastion host and the managed host resource with network diagnosis built in the bastion host. You can use any of the following methods to check the connectivity:

- Ping the host IP address to check whether the bastion host communicates with the host resource over the ICMP protocol.
- Perform route tracing on the host address to check whether the route between the bastion host and the host resource is reachable.
- Perform the TCP port test on the host IP address to check the host resource is reachable over the TCP port from the bastion host.

NOTE

- If the network is unreachable, rectify the fault.
- If the network connectivity is normal, check whether the username, password, and port number of the host added to the system are correct.

This topic describes how to test the network connectivity.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **System Maintain** > **Network Diagnosis**.

Step 3 Ping the IP address of the host to check the network connectivity.

1. Set **Infotype** to **ping**.
2. Enter the host IP address and click **Test** to view the connectivity test result.
3. Check whether the system can communicate with the host using the ICMP protocol.

Step 4 Traceroute the host IP address and check the network connectivity.

1. Set **Infotype** to **traceroute**.
2. Enter the host IP address and click **Test** to view the connectivity test result.
3. Check whether there is a reachable route between the system and the host.

Step 5 Test network connectivity through the TCP port.

1. Set **Infotype** to **TCP port**.
2. Enter the host IP address and port number and click **Test** to view the connectivity test result.
3. Check whether the TCP port between the system and the host is reachable.

----End

11.3.6 System Diagnosis

With system diagnosis, you can easily obtain information about the current system, including comprehensive information and details about system load, kernel, memory, network interface card (NIC), disk usage, routes, and ARP.

This topic describes how to obtain the system background information.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

Step 2 Choose **System** > **System Maintain** > **System Diagnosis**.

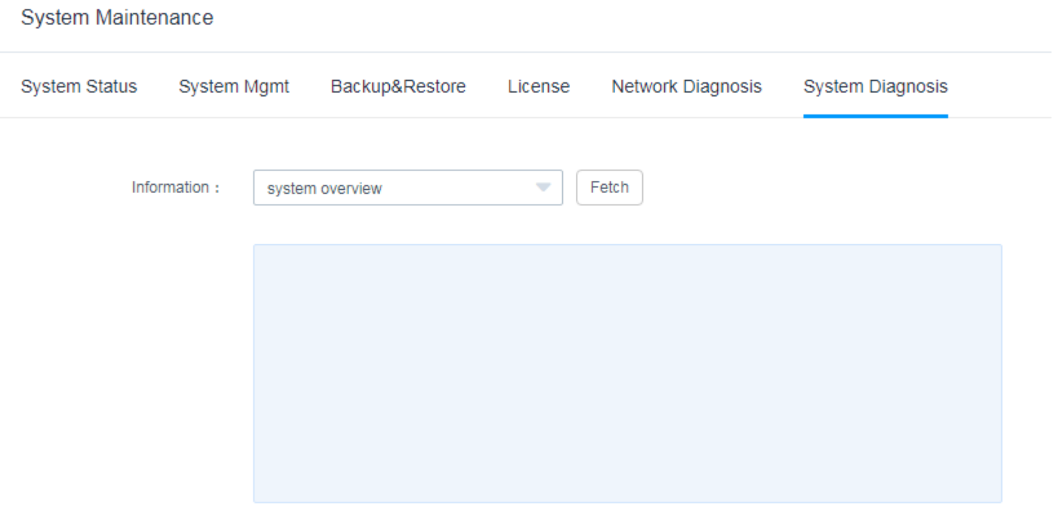
Step 3 Select an information type and then click **Fetch** to view the details.

Table 11-11 System diagnosis parameters

Parameter	Description
system overview	Obtains overview information about the bastion host, including memory, I/O, and CPU.
system load	Obtains information about the bastion host load.

Parameter	Description
system kernel	Obtains information about the system kernel.
memory summary	Obtains information about the system memory.
network interfaces	Obtains information about the system NIC.
disk usage	Obtains information about the disk usage of the system.
route table	Obtains route information about the system.
ARP table	Obtains ARP information about the system.

Figure 11-21 System Diagnosis



Information : system overview

----End

11.4 About System

This topic walks you through how to view basic system information.

Prerequisites

You have the management permissions for the **System** module.

Procedure

Step 1 Log in to your bastion host.

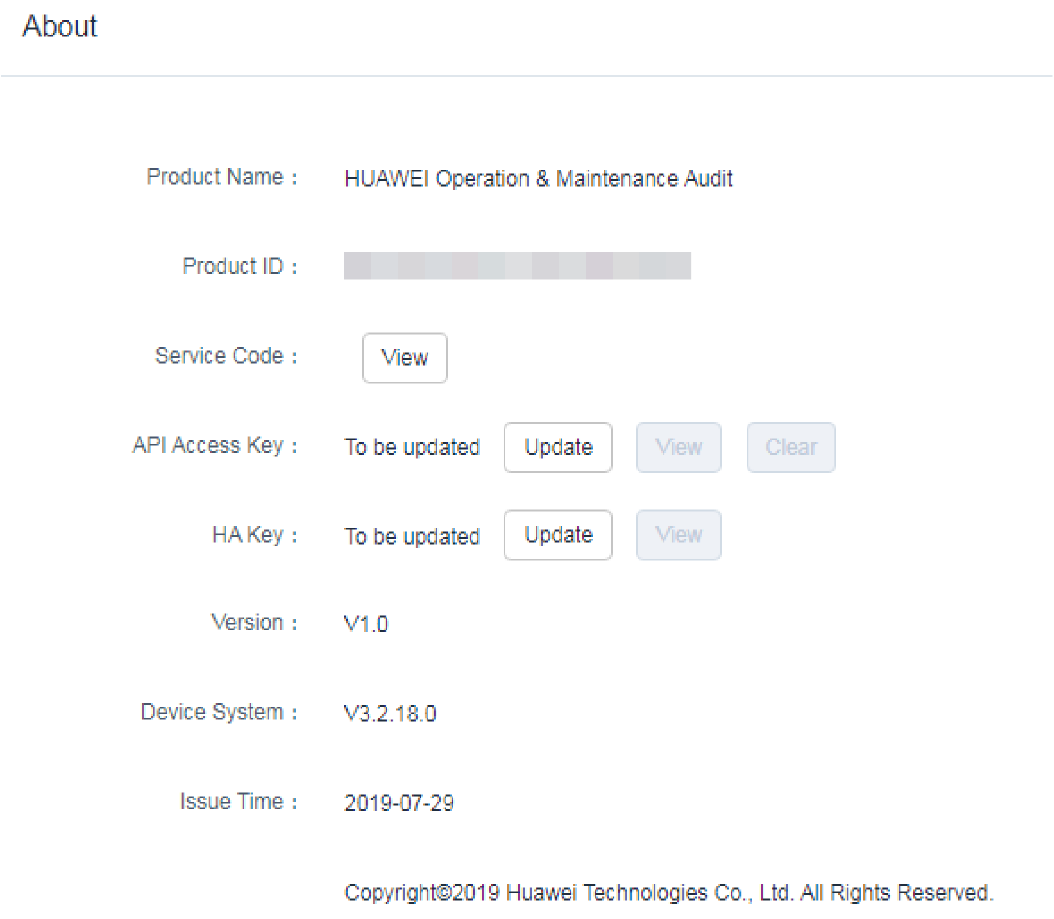
Step 2 On the left navigation pane, choose **System** > **About**.

Step 3 View basic system information.

Table 11-12 System parameters

Parameter	Description
Product Name	Bastion host
Product ID	Unique authentication code of a product
Service Code	This code is used by technical personnel to log in to the system background and manage the background. Click **View** to obtain the code. After obtaining the service code, keep it secure. Do not send it to the public information platforms. **NOTE** When technical personnel use the service code to log in to the system backend, a piece of root account login record will be added to the bastion host login log.
API Access Key	Used for node authentication on the unified management platform ● **View**: To view the information, enter the password of the system administrator **admin**, access key secret, and access key ID. ● **Update** and **Clear**: To update or clear the API credentials, enter the password of the system administrator **admin**. After the password is updated or cleared, the node managed by the unified management platform becomes invalid.
HA Key	Used to configure the HA When configuring the standby node for HA on the web interface, connect the programs on the standby node to the specified active one, perform the validity check based on configuration information, and then modify the configuration on the active node after the validity check is passed.
Version	Version of the current system
Device System	Version of the current system software
Issue Time	Release date of the current system

Figure 11-22 About



About

Product Name : HUAWEI Operation & Maintenance Audit

Product ID : [redacted]

Service Code :

API Access Key : To be updated

HA Key : To be updated

Version : V1.0

Device System : V3.2.18.0

Issue Time : 2019-07-29

Copyright©2019 Huawei Technologies Co., Ltd. All Rights Reserved.

----End

12 Installing an Application Server

12.1 Overview

For Windows and special Linux OSs, resource O&M cannot be directly performed on the bastion host console. You need to create an application publishing server to implement resource O&M.

Specification Selection

When applying for a publishing server, you are advised to select the memory specifications of the publishing server based on the number of resources to be operated and maintained to ensure that all resources can be operated and maintained properly.

Table 12-1 Recommended specifications and number of assets for an application publishing server

Memory Specifications	Idle Memory Usage	Available Memory	Concurrent Assets Supported
4GiB	About 800 MiB	About 3.2 GiB	About 16
8GiB	About 800 MiB	About 7.2 GiB	About 36
16GiB	About 800 MiB	About 15.2 GiB	About 76
32GiB	About 800 MiB	About 31.2 GiB	About 156
64GiB	About 800 MiB	About 63.2 GiB	About 316
128GiB	About 800 MiB	About 127.2 GiB	About 636

12.2 Installing a Windows Server 2019 Application Server

12.2.1 Installing a Server

Prerequisites

You have obtained the account and its password of the server administrator.

Procedure

Step 1 Log in to the server as the administrator.

Step 2 Start **Server Manager** and click **Dashboard**.

Step 3 Click **Add Roles and Features**. In the displayed **Add Roles and Features Wizard** dialog box, complete settings as prompted, and click **Next**.

Step 4 On the **Installation Type** page, select **Role-based or feature-based installation**.

Step 5 Select a destination server.

Step 6 In the **Server Roles** window, select **Active Directory Domain Services**, **DNS Server**, and **Remote Desktop Service**.

Step 7 (Optional) Select features required for the server or click **Next** to skip this step.

Step 8 Choose **Remote Desktop Service** > **Role Service**.

Select **Remote Desktop Session Host**, **Remote Desktop Connection Broker**, **Remote Desktop Licensing**, **Remote Desktop Gateway**, and **Remote Desktop Web Access**.

Step 9 (Optional) Choose **Web Server (IIS)** > **Role Services**. In the displayed window, accept the default settings.

Step 10 (Optional) Choose **Network Policies and Access Services**. Accept the default selection.

Step 11 Confirm the installation settings and click **Install**.

Step 12 When the installation completes, click **Finish** and restart the application server.

----End

12.2.2 Licensing and Activating the Remote Desktop Service

Prerequisites

- You have obtained the enterprise license number and related information.
- You have obtained the account and its password of the server administrator.

Procedure

Step 1 Log in to the server as the administrator.

Step 2 Choose **Start** > **Administrative Tools** > **Remote Desktop Services** > **Remote Desktop Licensing Manager**.

Step 3 In the displayed window, right-click the target server name, and then choose **Activate Server** from the shortcut menu.

Step 4 Open the **Activate Server Wizard** and perform operations as prompted.

Step 5 Select the automatic connection method.

Step 6 Enter the information about your company and user name.

Step 7 (Optional) Enter the detailed contact information about the company.

Step 8 Confirm the installation and start the license installation wizard.

Step 9 Select **Enterprise Agreement** for **License program**.

Step 10 Enter the enterprise agreement number.

NOTE

The enterprise agreement number must be purchased from the third-party platform in advance to obtain the official remote desktop authorization license.

Step 11 Select **Windows Server 2019** for **Product version**, select **RDS Per User CAL** for **License type**, and set **Quantity** to **100**.

Step 12 After the license is installed, activate the server and return to the **Remote Desktop Licensing Manager** console and check whether the server is activated.

----End

12.2.3 Modifying the Group Policy

Prerequisites

You have obtained the account and its password of the server administrator.

Starting Local Group Policy Editor

Open the command line interface and enter **gpedit.msc** to open **Local Group Policy Editor**.

Selecting the Specified Remote Desktop License Servers

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Licensing**.

Step 2 Double-click **Use the specified Remote Desktop license servers**.

Step 3 In the displayed dialog box, select the **Enabled** option.

Step 4 Click **OK**.

----End

Hiding Notifications About RD Licensing Problems that Affect the RD Session Host Server

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Licensing**.

Step 2 Double-click **Hiding notifications about RD Licensing problems that affect the RD Session Host Server**.

Step 3 Select the **Enable** option.

Step 4 Then, click **OK**.

----End

Setting the Remote Desktop Licensing Mode

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Licensing**.

Step 2 Double-click **Set the Remote Desktop licensing mode**.

Step 3 Select **Enabled** to enable the remote desktop licensing mode.

In the displayed window, select the **Enabled** option. In the **Options** area, under **Specify the licensing mode for the RD Session Host server**, select **Per User** from the drop-down list.

Step 4 Then, click **OK**.

----End

Limit number of connections

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Connections**.

Step 2 Double-click **Limit Number of Connections**.

Step 3 Select the **Enabled** option.

Set **RD Maximum Connections allowed** to **999999**.

Step 4 Then, click **OK**.

----End

Allowing Remote Start of Unlisted Programs

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Connections**.

Step 2 Double-click **Allow remote start of unlisted programs**.

Step 3 In the displayed dialog box, select the **Enabled** option.

Step 4 Then, click **OK**.

----End

Restrict Remote Desktop Services users to a single Remote Desktop Services session

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Connections**.

Step 2 Double-click **Restrict Remote Desktop Services users to a single Remote Desktop Services session**.

Step 3 In the displayed window, select the **Disabled** option.

Step 4 Then, click **OK**.

----End

Setting Time Limit for Disconnected Sessions

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Session Time Limits**.

Step 2 Double-click **Set time limit for disconnected sessions**.

Step 3 In the displayed dialog box, select the **Enabled** option.

Set **End a disconnected session** to **1 minute**.

Step 4 Then, click **OK**.

----End

Refreshing the Local Group Policy

Step 1 Close the **Local Group Policy Editor** window.

Step 2 Open the **Run** box and run the **gpupdate /force** command to refresh the local policy.

Step 3 The application publish server has been deployed. To test its function, add this server and applications on it to your bastion host.

----End

12.2.4 Installing RemoteApp Program

In CBH systems of V3.3.26.0 or later, RemoteAppProxy must be installed on application publishing servers.

Prerequisites

You have obtained the account and its password of the server administrator.

Procedure

Step 1 Log in to the server as the administrator.

Step 2 Download the ***RemoteaProxyInstaller_xxx.zip*** (xxx is the version number) package.

Download the required software package at:

- **RemoteaProxyInstaller_v3.3.26.0 to v3.3.37.0 and later**
- **RemoteaProxyInstaller_v3.3.38.0 and later**
- **RemoteaProxy1.1.19.0 download link** (adapts to all bastion host versions)

NOTE

The server must have an EIP bound.

Step 3 Decompress **RemoteaProxyInstaller_*xxx*.zip** (*xxx* indicates the version number).

Step 4 Double-click **RemoteaProxyInstaller_*xxx*.msi** (xxx indicates the version number) to start the installation.

Select the default installation path.

Step 5 After the installation completes, click **Close**.

----End

12.3 Installing a Windows Server 2016 Application Server

12.3.1 Installing a Server

Prerequisites

You have obtained the account and its password of the server administrator.

Procedure

Step 1 Log in to the server as the administrator.

Step 2 Start **Server Manager** and click **Dashboard**.

Step 3 Click **Add Roles and Features**. In the displayed **Add Roles and Features Wizard** dialog box, complete settings as prompted, and click **Next**.

Step 4 On the **Installation Type** page, select **Role-based or feature-based installation**.

Step 5 Select a destination server.

Step 6 In the **Server Roles** window, select **Active Directory Domain Services**, **DNS Server**, and **Remote Desktop Service**.

Step 7 (Optional) Select features required for the server or click **Next** to skip this step.

Step 8 Choose **Remote Desktop Service** > **Role Service**.

Select **Remote Desktop Session Host**, **Remote Desktop Connection Broker**, **Remote Desktop Licensing**, **Remote Desktop Gateway**, and **Remote Desktop Web Access**.

Step 9 (Optional) Choose **Web Server (IIS)** > **Role Services**. In the displayed window, accept the default settings.

Step 10 (Optional) Choose **Network Policies and Access Services**. Accept the default selection.

Step 11 Confirm the installation settings and click **Install**.

Step 12 When the installation completes, click **Finish** and restart the application server.

----End

12.3.2 Licensing and Activating the Remote Desktop Service

Prerequisites

- You have obtained the enterprise license number and related information.
- You have obtained the account and its password of the server administrator.

Procedure

Step 1 Log in to the server as the administrator.

Step 2 Choose **Start** > **Administrative Tools** > **Remote Desktop Services** > **Remote Desktop Licensing Manager**.

Step 3 In the displayed window, right-click the target server name, and then choose **Activate Server** from the shortcut menu.

Step 4 Open the **Activate Server Wizard** and perform operations as prompted.

Step 5 Select the automatic connection method.

Step 6 Enter the information about your company and user name.

Step 7 (Optional) Enter the detailed contact information about the company.

Step 8 Confirm the installation and start the license installation wizard.

Step 9 Select **Enterprise Agreement** for **License program**.

Step 10 Enter the enterprise agreement number.

NOTE

The enterprise agreement number must be purchased from the third-party platform in advance to obtain the official remote desktop authorization license.

Step 11 Select **Windows Server 2016** for **Product version**, select **RDS Per User CAL** for **License type**, and set **Quantity** to **100**.

Step 12 After the license is installed, activate the server and return to the **Remote Desktop Licensing Manager** console and check whether the server is activated.

----End

12.3.3 Modifying the Group Policy

Prerequisites

You have obtained the account and its password of the server administrator.

Starting Local Group Policy Editor

Open the command line interface and enter **gpedit.msc** to open **Local Group Policy Editor**.

Selecting the Specified Remote Desktop License Servers

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Licensing**.

Step 2 Double-click **Use the specified Remote Desktop license servers**.

Step 3 In the displayed dialog box, select the **Enabled** option.

Step 4 Click **OK**.

----End

Hiding Notifications About RD Licensing Problems that Affect the RD Session Host Server

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Licensing**.

Step 2 Double-click **Hiding notifications about RD Licensing problems that affect the RD Session Host Server**.

Step 3 Select the **Enable** option.

Step 4 Then, click **OK**.

----End

Setting the Remote Desktop Licensing Mode

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Licensing**.

Step 2 Double-click **Set the Remote Desktop licensing mode**.

Step 3 Select **Enabled** to enable the remote desktop licensing mode.

In the displayed window, select the **Enabled** option. In the **Options** area, under **Specify the licensing mode for the RD Session Host server**, select **Per User** from the drop-down list.

Step 4 Then, click **OK**.

----End

Limit number of connections

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Connections**.

Step 2 Double-click **Limit Number of Connections**.

Step 3 Select the **Enabled** option.

Set **RD Maximum Connections allowed** to **999999**.

Step 4 Then, click **OK**.

----End

Allowing Remote Start of Unlisted Programs

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Connections**.

Step 2 Double-click **Allow remote start of unlisted programs**.

Step 3 In the displayed dialog box, select the **Enabled** option.

Step 4 Then, click **OK**.

----End

Restrict Remote Desktop Services users to a single Remote Desktop Services session

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Connections**.

Step 2 Double-click **Restrict Remote Desktop Services users to a single Remote Desktop Services session**.

Step 3 In the displayed window, select the **Disabled** option.

Step 4 Then, click **OK**.

----End

Setting Time Limit for Disconnected Sessions

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Session Time Limits**.

Step 2 Double-click **Set time limit for disconnected sessions**.

Step 3 In the displayed dialog box, select the **Enabled** option.

Set **End a disconnected session** to **1 minute**.

Step 4 Then, click **OK**.

----End

Disabling Automatic Root Certificates Update (CBH V3.3.26.0 or Later)

If your CBH system is earlier than V3.3.26.0, skip this operation. If your CBH system is upgrade to V3.3.26.0 or later, perform the following steps.

Step 1 Choose **Administrative Templates** > **System** > **Internet Communication Management**.

Step 2 Double-click **Turn off Automatic Root Certificates Update**.

Step 3 Select **Enabled**.

Step 4 Then, click **OK**.

----End

Configuring Certificate Path Validation Settings (CBH V3.3.26.0 or Later)

If your CBH system is earlier than V3.3.26.0, skip this operation. If your CBH system is upgrade to V3.3.26.0 or later, perform the following steps.

Step 1 Choose **Windows Settings** > **Security Settings** > **Public Key Policies**.

Step 2 Double-click **Certificate Path Validation Settings**.

Step 3 Click the **Network Retrieval** tab.

Step 4 Clear the **Automatically update certificates in the Microsoft Root Certificate Program (recommended)** check box.

Set **Default URL retrieval timeout (in seconds)** to **1**.

Step 5 Then, click **OK**.

----End

Refreshing the Local Group Policy

Step 1 Close the **Local Group Policy Editor** window.

Step 2 Open the **Run** box and run the **gpupdate /force** command to refresh the local policy.

Step 3 The application publish server has been deployed. To test its function, add this server and applications on it to your bastion host.

----End

12.3.4 Installing RemoteApp Program

In CBH systems of V3.3.26.0 or later, RemoteAppProxy must be installed on application publishing servers.

Prerequisites

You have obtained the account and its password of the server administrator.

Procedure

Step 1 Log in to the server as the administrator.

Step 2 Download the ***RemoteaProxyInstaller_xxx.zip*** (xxx is the version number) package.

Download the required software package at:

- **RemoteaProxyInstaller_v3.3.26.0 to v3.3.37.0 and later**
- **RemoteaProxyInstaller_v3.3.38.0 and later**
- **RemoteaProxy1.1.19.0 download link** (adapts to all bastion host versions)

NOTE

The server must have an EIP bound.

Step 3 Decompress **RemoteaProxyInstaller_*xxx*.zip** (*xxx* indicates the version number).

Step 4 Double-click **RemoteaProxyInstaller_*xxx*.msi** (xxx indicates the version number) to start the installation.

Select the default installation path.

Step 5 After the installation completes, click **Close**.

----End

12.4 Installing a Windows Server 2012 R2 Application Server

12.4.1 Installing a Server

Step 1 Start **Server Manager** and click **Dashboard**.

Step 2 Click **Add Roles and Features**. In the displayed **Add Roles and Features Wizard** dialog box, complete settings as prompted, and click **Next**.

Step 3 On the **Installation Type** page, select **Role-based or feature-based installation**.

Step 4 Select a destination server.

Step 5 In the **Server Roles** window, select **Active Directory Domain Services**, **DNS Server**, and **Remote Desktop Service**.

Step 6 (Optional) Select features required for the server or click **Next** to skip this step.

Step 7 Choose **Remote Desktop Service** > **Role Service**.

Select **Remote Desktop Session Host**, **Remote Desktop Connection Broker**, **Remote Desktop Licensing**, **Remote Desktop Gateway**, and **Remote Desktop Web Access**.

Step 8 (Optional) Choose **Web Server (IIS)** > **Role Services**. In the displayed window, accept the default settings.

Step 9 (Optional) Choose **Network Policies and Access Services**. Accept the default selection.

Step 10 Confirm the installation settings and click **Install**.

Step 11 When the installation completes, click **Finish** and restart the application server.

----End

12.4.2 Licensing and Activating the Remote Desktop Service

Prerequisites

- You have obtained the enterprise license number and related information.
- You have obtained the account and its password of the server administrator.

Procedure

Step 1 Open the Remote Desktop Licensing Manager.

Step 2 In the displayed window, right-click the target server name, and then choose **Activate Server** from the shortcut menu.

Step 3 Open the **Activate Server Wizard** and perform operations as prompted.

Step 4 Select the automatic connection method.

Step 5 Enter the information about your company and user name.

Step 6 (Optional) Enter the detailed contact information about the company.

Step 7 Confirm the installation and start the license installation wizard.

Step 8 Select **Enterprise Agreement** for **License program**.

Step 9 Enter the enterprise agreement number.

NOTE

The enterprise agreement number must be purchased from the third-party platform in advance to obtain the official remote desktop authorization license.

Step 10 Select **Windows Server 2012 R2** for **Product version**, select **RDS Per User CAL** for **License type**, and set **Quantity** to **100**.

Step 11 After the license is installed, activate the server and return to the **Remote Desktop Licensing Manager** console and check whether the server is activated.

----End

12.4.3 Modifying the Group Policy

Local Group Policy Editor

Open the **Run** box and enter **gpedit.msc** to open **Local Group Policy Editor**.

Using the Specified Remote Desktop License Servers

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Licensing**. Double-click **Use the specified Remote Desktop license servers**.

Step 2 In the displayed window, select the **Enabled** option.

Step 3 Click **OK**.

----End

Hiding Notifications About RD Licensing Problems that Affect the RD Session Host Server

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Licensing**. Double-click **Hide notifications about RD Licensing problems that affect the RD Session Host Server**.

Step 2 In the displayed window, select the **Enabled** option.

Step 3 Then, click **OK**.

----End

Setting the Remote Desktop Licensing Mode

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Licensing**. Double-click **Set the Remote Desktop licensing mode**.

Step 2 In the displayed window, select the **Enabled** option. In the **Options** area, under **Specify the licensing mode for the RD Session Host server**, select **Per User** from the drop-down list.

Step 3 Then, click **OK**.

----End

Limit number of connections

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Connections**. Double-click **Limit number of connections**.

Step 2 In the displayed window, select the **Enabled** option, then set **RD Maximum Connections allowed** to **999999**.

Step 3 Then, click **OK**.

----End

Allowing Remote Start of Unlisted Programs

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** >

Connections. Double-click **Allow users to connect remotely using Remote Desktop Services**.

Step 2 In the displayed dialog box, select the **Enabled** option.

Step 3 Then, click **OK**.

----End

Restrict Remote Desktop Services users to a single Remote Desktop Services session

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Connections**. Double-click **Restrict Remote Desktop Services user to a single Remote Desktop Services session**.

Step 2 In the displayed window, select the **Disabled** option.

Step 3 Then, click **OK**.

----End

Setting Time Limit for Disconnected Sessions

Step 1 Choose **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Session Time Limits**. Double-click **Set time limit for disconnected sessions**.

Step 2 In the displayed window, select **Enabled** for **Set time limit for disconnected sessions**, and change the value of **End a disconnected session** to **1 minute**.

Step 3 Then, click **OK**.

----End

Refreshing the Local Group Policy

Step 1 Close the **Local Group Policy Editor** window.

Step 2 Open the **Run** box and run the **gpupdate /force** command to refresh the local policy.

Step 3 The application publish server has been deployed. To test its function, add this server to your bastion host.

----End

12.4.4 Installing RemoteApp Program

In CBH systems of V3.3.26.0 or later, RemoteAppProxy must be installed on application publishing servers.

Prerequisites

You have obtained the account and its password of the server administrator.

Procedure

Step 1 Log in to the server as the administrator.

Step 2 Download the ***RemoteaProxyInstaller_xxx.zip*** (xxx is the version number) package.

Download the required software package at:

- **RemoteaProxyInstaller_v3.3.26.0 to v3.3.37.0 and later**
- **RemoteaProxyInstaller_v3.3.38.0 and later**
- **RemoteaProxy1.1.19.0 download link** (adapts to all bastion host versions)

NOTE

The server must have an EIP bound.

Step 3 Decompress **RemoteaProxyInstaller_*xxx*.zip** (*xxx* indicates the version number).

Step 4 Double-click **RemoteaProxyInstaller_*xxx*.msi** (xxx indicates the version number) to start the installation.

Select the default installation path.

Step 5 After the installation completes, click **Close**.

----End

12.5 Installing a Windows Server 2008 R2 Application Server

12.5.1 Installation Environment

The following is the information of the server where the AD domain is installed:

- Windows Server version: Windows Server 2008 R2 (All software packages have been installed.)
- IP address: 192.168.*X.X*/*X*
- Gateway address: 192.168.*X.X*
- DNS: 192.168.*X.X*
- Domain name: example.com
- Computer name: server

12.5.2 Installing the AD Domain

Changing the Computer Name and Static Server IP Address

Change the service IP address, point the DNS address to the local host, and then change the computer name to **server**. After the AD domain service is installed, the host name is automatically changed to the format of *host name*+*domain name*.

Installing the AD Domain

Run the **dcpromo.exe** command on the CLI to install the AD domain and DNS server. Do not install the AD domain and DNS server using the wizard for adding roles.

AD Domain Service Installation Wizard

Step 1 To install the AD domain, click **Next**.

Step 2 Click **Next**.

Step 3 Select the option indicating creating a domain in a new forest and click **Next**.

Step 4 Click **Next**.

Step 5 Set the forest function level, select **Windows Server 2008 R2** from the drop-down list, and click **Next**.

Step 6 Select **DNS server** and click **Next**.

Step 7 If a message is displayed indicating that the DNS delegation fails to be created, click **Yes** and continue.

Step 8 Select the directories for storing database files and log files. You can retain the default settings and click **Next**.

Step 9 Set the password for the directory services restore mode (DSRM). The **Administrator** password in DSRM is not the same as the system password. Click **Next**.

Step 10 On the summary page that is displayed, click **Next**.

Step 11 Tick the box indicating to restart the system after installation.

Step 12 After the restart, log in as a domain user.

Step 13 The AD domain environment has been installed.

----End

12.5.3 Installing and Licensing Remote Desktop Service

Remote Desktop Service Installation and Configuration

Step 1 Choose **Server Manager** > **Roles** > **Add Roles Wizard**.

Step 2 Select **Remote Desktop Services** and click **Next**.

Step 3 Click **Next**.

Step 4 Click **Next**.

Step 5 Select **Install Remote Desktop Session Host Anyway**, and then click **Next**.

Step 6 Select **Role Services**. Select **Remote Desktop Session Host** and **Remote Desktop Licensing**, and click **Next**.

Step 7 Click **Next**.

Step 8 Select the option **Do not require Network Level Authentication**, and then click **Next**.

Step 9 Select **Configure later** and click **Next**.

Step 10 By default, **Administrators** can connect to the RD session host server (if necessary, add required users or user groups) and click **Next**.

Step 11 Click **Next**.

Step 12 Click **Next**.

Step 13 Select **Choose a certificate for SSL encryption later** and click **Next**.

Step 14 Select **Later** and click **Next**.

Step 15 Retain the default configuration and click **Next**.

Step 16 Select **Role Services**. Select **Network Policy Server** and click **Next**.

Step 17 Install IIS and click **Next**.

Step 18 Retain the default configuration and click **Next**.

Step 19 Retain the default configuration and click **Install**.

Step 20 The installation process is displayed. Please wait.

Step 21 After the installation is complete, click **Close**. In the displayed dialog box, select **Yes** to restart the server, and then click **Next**.

Step 22 After the server is restarted, the role service configuration window is displayed. After the automatic configuration is complete, click **Close**.

Step 23 Choose **Start** > **Administrative Tools** > **Remote Desktop Service** > **Remote Desktop Session Host Configuration**. In the right pane, double-click the line indicating that only one session is allowed for each user. In the **Properties** page, deselect the option indicating that only one session is allowed for each user and click **OK**.

----End

Activating Remote Desktop Authorization

Step 1 Choose **Start** > **Administrative Tools** > **Remote Desktop Services** > **Remote Desktop Licensing Manager**. Because the RD authorization server is not activated, the red cross (x) is displayed in the lower right corner of the authorization server icon. Right-click **Server** and select **Activate Server**.

Step 2 Click **Next**.

Step 3 Click **Next**.

Step 4 Enter the mandatory registration information and click **Next**.

Step 5 Retain the default configuration and click **Next**.

Step 6 By default, the option indicating that the license installation wizard starts immediately is selected. Click **Next**.

Step 7 Click **Next**.

Step 8 Select **Enterprise contract** for **License Plan** and click **Next**.

Step 9 Enter the contract number and click **Next**.

Step 10 Select **Windows Server 2008 or Windows Server 2008 R2** for the product version. Select **TS or RDS per user CAL** for the license type. Enter the maximum number of remote connections allowed.

Step 11 Click **Finish**.

Step 12 The RD authorization server has been activated, and the icon changes from a red cross (x) to a green tick (√). The configuration and activation of the remote desktop service are complete.

----End

12.5.4 Modifying the Group Policy

Local Group Policy Editor

Step 1 Choose **Start** > **Run** and enter **gpedit.msc** to open the group policy.

Step 2 Choose **Computer Configuration** > **Management Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** >

Licensing. Double-click **Use the specific Remote Desktop license servers** on the right.

----End

Hiding Notifications About RD Licensing Problems that Affect the RD Session Host Server

Open the **Hide notification about RD Licensing problems that affect the RD Session Host server** dialog box, select **Enabled**, and click **Next Setting**.

Setting the Remote Desktop Licensing Mode

In the **Set the Remote Desktop licensing mode** dialog box, select **Enabled**. In the **Specify the licensing mode for the RD Session Host server** drop-down list, select **Per User** and click **OK**.

Configuring Multiple Users for the Terminal Service

Step 1 Choose **Start** > **Run** and enter **gpedit.msc** to open the group policy.

Step 2 Choose **Computer Configuration** > **Management Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Connections**.

Step 3 Select **Enabled** for **Limit number of connections** and set the maximum number of connections to **999999**.

Step 4 Select **Enabled** for **Allow users to connect remotely using Remote Desktop Services**.

Step 5 Click **OK**.

Step 6 Choose **Computer Configuration** > **Management Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Session Time Limits**.

Step 7 Select **Enabled** for **Set time limit for disconnected sessions**, and change the value of **End a disconnected session** to **1 minute**.

Step 8 Click **OK**.

----End

Update Policy

Step 1 Close the local group policy editor. Choose **Start** > **Run**, and enter **gpupdate / force**.

Step 2 Update the local policy.

Step 3 The application publish server has been deployed. To test its function, add this server to your bastion host.

----End

12.5.5 Installing RemoteApp Program

In CBH systems of V3.3.26.0 or later, RemoteAppProxy must be installed on application publishing servers.

Prerequisites

You have obtained the account and its password of the server administrator.

Procedure

Step 1 Log in to the server as the administrator.

Step 2 Download the ***RemoteaProxyInstaller_xxx.zip*** (xxx is the version number) package.

Download the required software package at:

- **RemoteaProxyInstaller_v3.3.26.0 to v3.3.37.0 and later**
- **RemoteaProxyInstaller_v3.3.38.0 and later**
- **RemoteaProxy1.1.19.0 download link** (adapts to all bastion host versions)

NOTE

The server must have an EIP bound.

Step 3 Decompress **RemoteaProxyInstaller_***xxx***.zip** (*xxx* indicates the version number).

Step 4 Double-click **RemoteaProxyInstaller_***xxx***.msi** (xxx indicates the version number) to start the installation.

Select the default installation path.

Step 5 After the installation completes, click **Close**.

----End

12.6 Installing a Linux Application Server

Basic Environment Requirements

- System requirements: CentOS release 7.9 minor
- Network requirements: The server must have an EIP bound.
- Firewall requirements: Port 2376 for Docker services and ports 35000 to 40000 must be allowed.

Prerequisites

You have obtained the password of the **root** user for logging in to the Linux server.

Procedure

Step 1 Log in to the Linux server as user **root**.

Step 2 On the Linux server, download the **Linux app_publisher_x86_64_*xxx*.tar.gz** package (xxx indicates the version number).

Table 12-2 app_publisher version description

CBH Version	Supported Architecture	app_publisher Version	Download URL
V3.3.26.0	x86 and Arm	V1.0.0	Software Package
V3.3.30.0	x86 and Arm	V1.1.0	Software Package
V3.3.38.0	X86	V1.2.0_CentOS7	Software Package
	Arm	V1.2.0_UOS20	Software Package
V3.3.40.0	X86	V1.3.0_CentOS7	Software Package
	Arm	V1.3.0_UOS	Software Package
V3.3.43.0	X86	V1.4.0_CentOS7	Software Package
	Arm	V1.4.0_UOS	Software Package
V3.3.46.0	X86	V1.5.0_CentOS7	Software Package
	Arm	V1.5.0_UOS	Software Package
V3.3.52.0	X86	1.6.1_EulerOS	Software Package
	Arm	1.6.1_EulerOS	Software Package
	X86	1.6.1_CentOS7	Software Package
	Arm	1.6.1_UOS	Software Package

Step 3 On the Linux server, run the following commands to decompress the **app_publisher_x86_64_*xxx*.tar.gz** package:

```
# tar -xvf app_publisher_*.tar.gz
```

```
# cd app_publisher
```

Step 4 Check whether the Firefox application publish server has been installed.

- If the server is installed, run the following command to delete the previously installed Docker image for Mozilla Firefox:

  ```
  # docker rmi 127.0.0.1:5000/psm-firefox:0.2
  ```

  After it is deleted, go to **Step 5**.

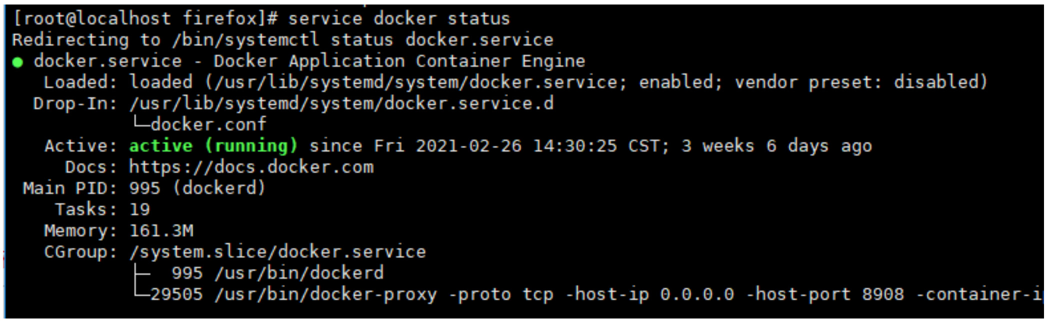
- If no such server is installed, go to **Step 5**.

Step 5 Run the following command to deploy the script:

# /bin/bash install.sh

Step 6 Run the following command to check the service status:

# service docker status



```
[root@localhost firefox]# service docker status
Redirecting to /bin/systemctl status docker.service
● docker.service - Docker Application Container Engine
   Loaded: loaded (/usr/lib/systemd/system/docker.service; enabled; vendor preset: disabled)
  Drop-In: /usr/lib/systemd/system/docker.service.d
           └─docker.conf
   Active: active (running) since Fri 2021-02-26 14:30:25 CST; 3 weeks 6 days ago
     Docs: https://docs.docker.com
 Main PID: 995 (dockerd)
    Tasks: 19
   Memory: 161.3M
   CGroup: /system.slice/docker.service
           ├─  995 /usr/bin/dockerd
           └─29505 /usr/bin/docker-proxy -proto tcp -host-ip 0.0.0.0 -host-port 8908 -container-i
```

active (running): indicates that the application server is successfully installed.

Step 7 Create the **share** directory (only required for CBH V3.3.26.0).

# mkdir /opt/autorun/share

Step 8 (Optional) Restart the application release server.

----End

13 Monitoring

13.1 CBH Monitoring Metrics

Description

This topic describes metrics reported by a bastion host to Cloud Eye as well as their namespaces. You can use Cloud Eye to query the metrics of the monitored objects and alarms generated for your bastion hosts.

NOTICE

Only CBH V3.3.30 and later versions can be interconnected with Cloud Eye.

Namespaces

SYS.CBH

NOTE

A namespace is an abstract collection of resources and objects. Multiple namespaces can be created in a single cluster with the data isolated from each other. This enables namespaces to share the same cluster services without affecting each other.

Metrics

Table 13-1 Bastion host metrics

Metric ID	Metric Name	Description	Value Range	Monitored Object	Monitoring Period (Original Metric)
cpu_util	CPU Usage	Measures the CPU usage of the physical server accommodating the monitored ECS, which is not accurate as that obtained on the monitored ECS.	0%~100%	Bastion host	300s
mem_util	Memory Usage	Memory usage of the monitored object	0%~100%	Bastion host	300s
disk_util	Disk Usage	Disk usage of the monitored object	0%~100%	Bastion host	300s
session_count	Session Connections	Number of session connections of the monitored object	≥0	Bastion host	300s
resource_count	Managed Resources	Total number of resources managed by the monitored object	≥0	Bastion host	300s

Dimensions

Key	Value
server_id	CBH instance ID

13.2 Configuring Monitoring Alarm Rules

You can set bastion host alarm rules to customize the monitored objects and notification policies, and set parameters such as the alarm rule name, monitored object, metric, threshold, monitoring scope, and whether to send notifications. This helps you learn your bastion host status in a timely manner.

Prerequisites

A bastion host has been created.

Procedure

Step 1 **Log in to the management console.**

Step 2 Click 📍 in the upper left corner of the management console and select a region or project.

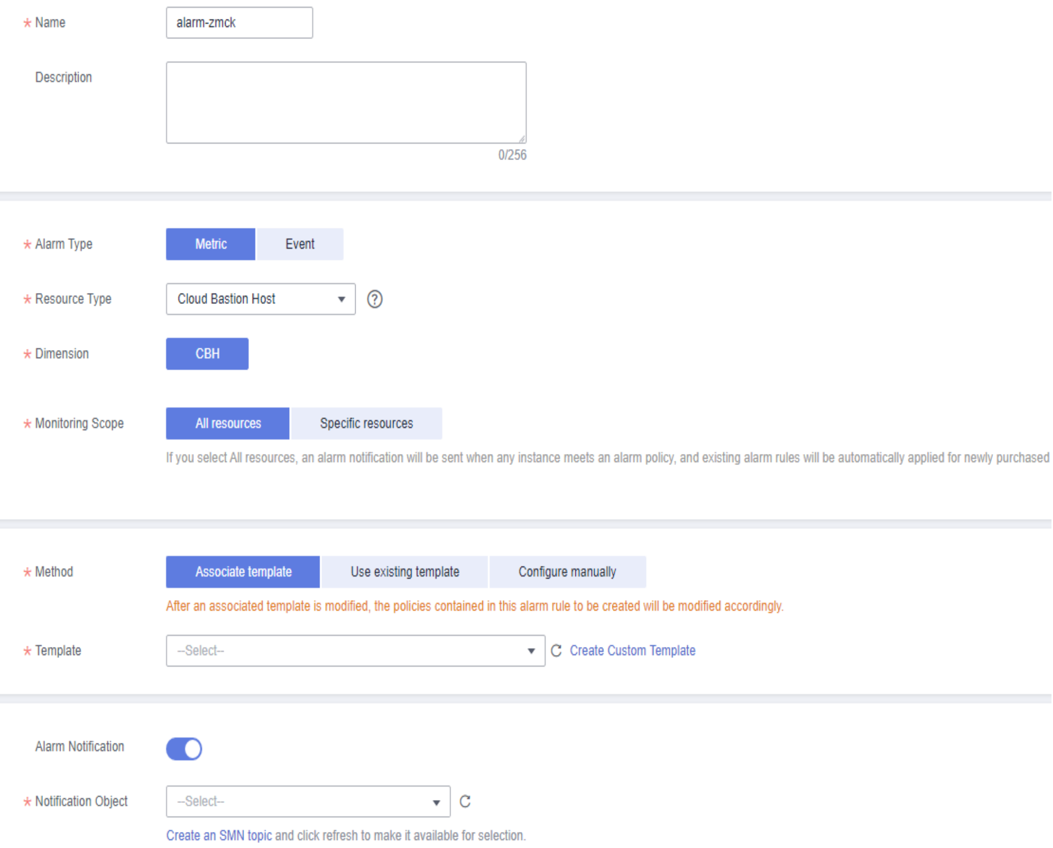
Step 3 Hover your mouse over ☰ in the upper left corner of the page and choose **Management & Governance** > **Cloud Eye**.

Step 4 In the navigation pane on the left, choose **Alarm Management** > **Alarm Rules**.

Step 5 In the upper right corner of the page, click **Create Alarm Rule**.

Step 6 Enter the alarm rule information by referring to **Table 13-2**.

Figure 13-1 Configuring CBH alarm rules



* Name: alarm-zmck

Description:

0/256

* Alarm Type: Metric | Event

* Resource Type: Cloud Bastion Host

* Dimension: CBH

* Monitoring Scope: All resources | Specific resources

If you select All resources, an alarm notification will be sent when any instance meets an alarm policy, and existing alarm rules will be automatically applied for newly purchased

* Method: Associate template | Use existing template | Configure manually

After an associated template is modified, the policies contained in this alarm rule to be created will be modified accordingly.

* Template: --Select--

Create Custom Template

Alarm Notification

* Notification Object: --Select--

Create an SMN topic and click refresh to make it available for selection.

Table 13-2 Parameters for setting CBH alarm rules

Parameter	Description	Example Value
Name	Name of the rule. The system generates a random name and you can modify it.	alarm-lm45
Description	Description of the rule.	-
Alarm Type	Select **Metric**.	Metric
Resource Type	Select a resource type. Select **Platform Bastion Host**.	Bastion host
Dimension	Select **CBH**.	CBH
Monitoring Scope	Scope where the alarm rule applies to. You can select **All resources**, **Resource groups** or **Specific resources**.	All resources

Parameter	Description	Example Value
Method	You can select an associated template, use an existing template, or create a custom template.	Associate template
Template	Select a template from the drop-down list, for example, CBH alarm template.	-
Alarm Policy	Edit alarm policies.	-
Alarm Notification	Whether to notify users when alarms are triggered. Notifications can be sent by email, text message, or HTTP/HTTPS message.	Enabled
Notification Recipient	You can select a notification group or subscript to a topic.	Topic subscription
Notification Object	Object that receives alarm notifications. You can select the account contact or a topic. ● Account contact is the mobile phone number and email address provided for registration. ● A topic is used to publish messages and subscribe to notifications. If the required topic is unavailable, create one and add subscriptions to it on the SMN console.	-
Notification Window	Cloud Eye sends notifications only within the notification window specified in the alarm rule.	00:00-8:00

Parameter	Description	Example Value
Trigger Condition	Condition for triggering the alarm notification. Select **Generated alarm** when an alarm is generated or **Cleared alarm** when an alarm is triggered, or both.	-

Step 7 Click **Create**. In the displayed dialog box, click **OK**.

----End

13.3 Viewing Metrics

You can view bastion host metrics on the management console to learn about the protection status in a timely manner and set protection policies based on the metrics.

Prerequisites

CBH alarm rules have been configured in Cloud Eye. For more details, see **Configuring Monitoring Alarm Rules**.

Procedure

Step 1 **Log in to the management console.**

Step 2 Click 📍 in the upper left corner of the management console and select a region or project.

Step 3 Hover your mouse over ☰ in the upper left corner of the page and choose **Management & Governance** > **Cloud Eye**.

Step 4 In the navigation pane on the left, choose **Cloud Service Monitoring** > **Cloud Bastion Host**.

Step 5 In the row containing the target CBH instance, click **View Metric** in the **Operation** column.

----End