

Data Admin Service

User Guide

Issue 01
Date 2023-12-01



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1 Permissions Management

1.1 Creating a User and Granting Permissions

You can use [IAM](#) to implement refined permission control for DAS resources. To be specific, you can:

- Create IAM users for employees from different departments of your enterprise. In this way, each IAM user has unique security credentials and can use DAS resources.
- Grant only the permissions required for users to perform a specific task.
- Entrust an account or cloud service to perform professional and efficient O&M on your DAS resources.

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

[Figure 1-1](#) describes how to grant permissions to a user group.

To assign DAS permissions using IAM, see [Creating a User Group and Assigning Permissions](#).

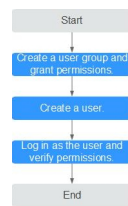
To assign DAS permissions through EPS, see [Adding a User Group to an Enterprise Project and Granting Permissions](#).

Prerequisites

Before granting permissions to a user group, learn about the DAS system policies that can be added and select a policy based on service requirements. For details, see [Permissions Management](#). For system policies of other services, see [Permission Policies](#).

Process Flow

Figure 1-1 Flowchart for granting DAS permissions



1. **Create a user group and assign permissions** Create a user group and assign permissions to it.
Create a user group on the IAM console and attach the **DAS FullAccess** policy to the group.
2. **Create a user and add it to a user group** Create a user and add it to a user group.
Create a user on the IAM console and add the user to the group created in 1.
3. **Log in** Log in and verify permissions.
In the service list, choose **Data Admin Service**. On the displayed page, click **Add DB Instance Connection**. If a database connection can be created, the DAS permissions have taken effect.

1.2 DAS Custom Policies

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

There are two ways to create custom policies:

- 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 about how to create custom policies, see [Creating a Custom Policy](#). This section describes example custom policies of DAS.

Examples of DAS Custom Policies

Example 1: Assign only DAS permissions.

```

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

Example 2: Assign users the permissions to use Intelligent O&M but not Development Tool.

```
{
  "Version": "1.1",
  "Statement": [
    {
      "Action": [
        "das:connections:list"
      ],
      "Effect": "Allow"
    }
  ]
}
```

1.3 Differences Between IAM Permissions and Database Permissions

As a management plane service, DAS does not directly add, delete, or modify customers' DB instances. Only adding, deleting, and modifying database login information are allowed on the DAS console.

IAM permission control applies to DAS only before you log in to an instance. After you log in to the instance, the permission verification is performed by database permissions.

DAS allows you to control whether IAM users can add, delete, and modify data connections and log in to an instance. For details, see [Custom Permissions Policies](#). After a user logs in to the database, IAM cannot interfere with the user to run SQL commands. In this case, only the database account permissions take effect.

Reference

[How Do I Use DAS to Log In to a Database Using a Read-Only Account?](#)

2 Logging in to a DB Instance

2.1 Logging in to a Huawei Cloud DB Instance

This section describes how to log in to a Huawei Cloud DB instance on DAS.

After a Huawei Cloud DB instance is created, DAS automatically creates login information for an administrator.

If you want to use a non-administrator account to log in to the DB instance, you need to create a DB instance login first. For details, see [Configuring Login Information](#).


Usage Notes

- RDS for MySQL, RDS for PostgreSQL, RDS for SQL Server, RDS for MariaDB, DDS, TaurusDB, GaussDB, and GeminiDB Cassandra instances are supported.
- The created DB instance and DAS must be in the same region.

Logging in to a DB Instance

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

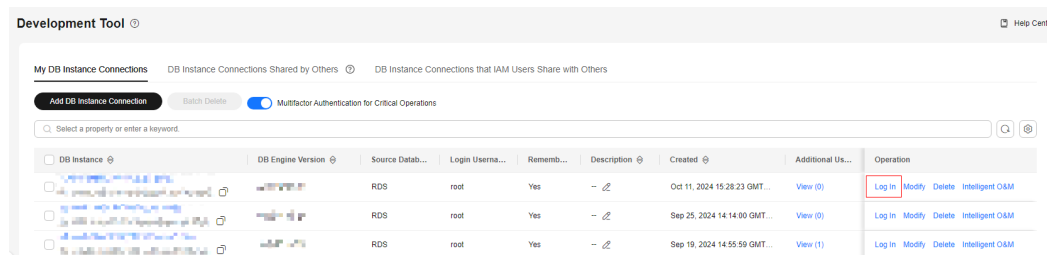
Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the target DB instance and click **Log In** in the **Operation** column.

You need to enter the password at the first login. If **Remember Password** is selected at the first login, you do not need to enter the password again at subsequent logins.

Figure 2-1 Database login information




NOTE


- If a DB instance is not found, its **Log In** button will be grayed out.
- If the pop-up window is blocked when you click **Log In**, configure your browser to allow the **Huawei Cloud** website. After that, you can log in to the instance.
- The **DB Instance Logins that IAM Users Share with Others** tab page is displayed only when the Huawei ID account is used for login.

----End

Configuring Login Information

Step 1 Log in to the Huawei Cloud console.

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

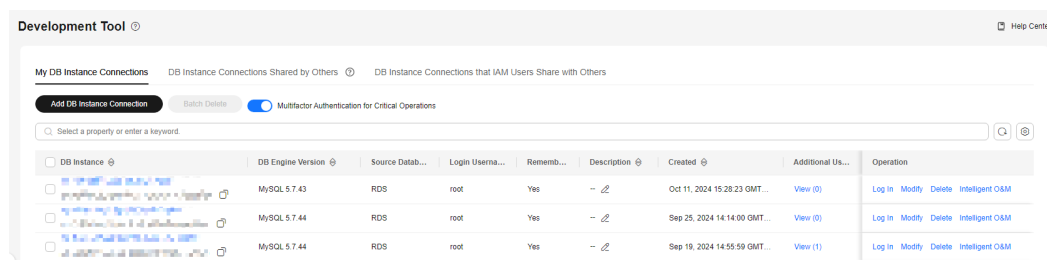
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 On the **My DB Instance Connections** tab page, click **Add DB Instance Connection**.

Figure 2-2 Adding a DB instance connection



Step 6 Configure parameters for the new DB instance connection.

Figure 2-3 Configuring parameters for the new DB instance connection

Add DB Instance Connection ✕

* DB Engine

* Source Database **RDS** ECS 🔍

DB Instance	DB Engine Version	DB Instance Type	Status
<input type="radio"/> flex[redacted]	MySQL 5.7	Single	Available
<input type="radio"/> [redacted]	MySQL 5.7	Single	Abnormal
<input type="radio"/> [redacted]	MySQL 8.0	Single	Abnormal
<input type="radio"/> [redacted]	MySQL 5.7	Ha	Available

Total Records: 4 5 < 1 >

* Login Username

* Password 🔗 Test Connection

Remember Password Your password will be encrypted and stored securely.

Description

Show Executed SQL Statements If not enabled, the executed SQL statements cannot be viewed, and you need to input each SQL statement manually.

Cancel OK

Table 2-1 Description

Parameter	Description	Example Value
DB Engine	DB engine for the instance that you want to add login information for.	MySQL

Parameter	Description	Example Value
Source Database	<p>The source database depends on the DB engine that you select.</p> <p>After you select a source database, all instances of the current type under your account are displayed. You can select the instance that you want to add a login for.</p> <p>The following types of source databases are supported:</p> <ul style="list-style-type: none"> • RDS • DDS • DDM • GaussDB • GeminiDB • DWS • MariaDB 	RDS
Login Username	<p>Username for logging in to the selected DB instance.</p> <p>The user must have the permission to allow DAS to access the selected DB instance using an IP address.</p>	root
Password	<p>Password for logging in to the selected DB instance.</p> <p>You can select Remember Password. With this function enabled, you do not need to enter the password when you want to log in to the DB instance later.</p>	-
Description	This parameter is optional.	-

Parameter	Description	Example Value
Show Executed SQL Statements	<p>If this function is enabled, all the SQL statements executed in the SQL window will be saved.</p> <p>You are advised to enable Show Executed SQL Statements. With it enabled, you can choose SQL Operations > SQL History to see what SQL statements you have executed and can re-execute any executed SQL statements rather than entering them again.</p>	Enabled

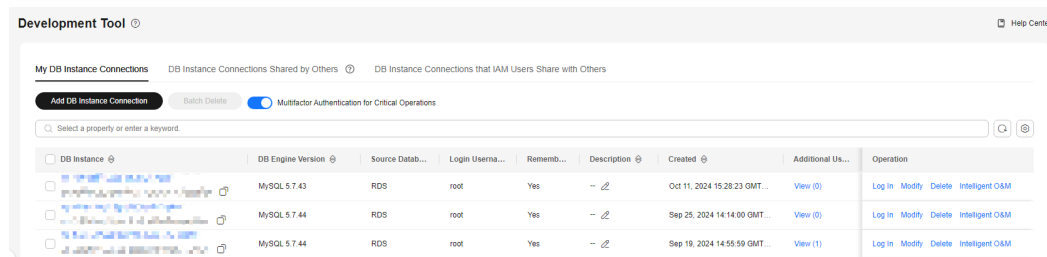
Step 7 After the DB instance information is configured, click **Test Connection** on the right of the password text box.

- If the connection test is successful, go to [Step 8](#).
- If a message is displayed indicating a connection test failure and failure causes, modify DB instance information based on the message and then go to [Step 8](#).

Step 8 After the connection test is successful, click **OK**.

Step 9 On the **My DB Instance Connections** tab page, view information about the new DB instance connection.

Figure 2-4 Viewing information about the new DB instance connection



You can also click **Modify** in the **Operation** column to modify the instance login information, or click **Delete** to delete unnecessary instance login information.

----End

Reference

- [Differences Between IAM Permissions and Database Permissions](#)
- [How Do I Use DAS to Log In to a Database Using a Read-Only Account?](#)

2.2 Logging In to a Database Built On Huawei Cloud ECSs

2.2.1 Step 1: Adding DB Instance Login Information

Before logging in to a DB instance built on a Huawei Cloud ECS, you need to add a DB instance login. A created DB instance login can be modified or deleted.


Usage Notes

- If you have not logged in to a DB instance using a created login for over a year, the system will automatically delete all data of the login, including the saved password.
- You can log in to a DB instance either on the DAS console or using other clients. These two methods do not affect each other.

Adding Login Information

Step 1 [Log in to the Huawei Cloud console](#).

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

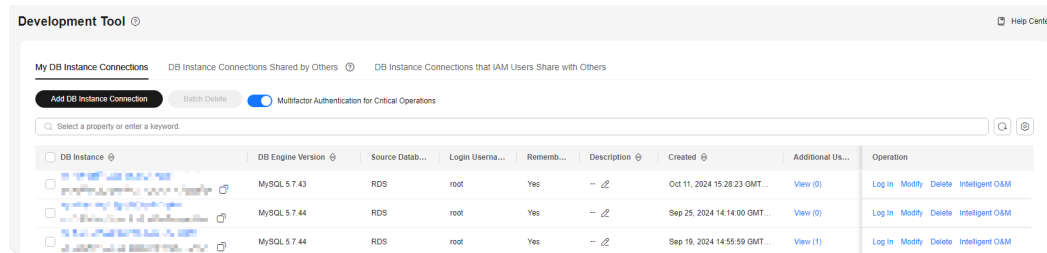
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Click **Add DB Instance Connection**.

Figure 2-5 Adding a DB instance connection




Step 6 Configure parameters for the new DB instance connection.

Figure 2-6 Configuring parameters for the new DB instance connection

Add DB Instance Connection ✕

* DB Engine: MySQL

* Source Database: RDS | **ECS** 🔍 Enter a DB instance name. 🔍

DB Instance Name	Status
 No data available.	

Total Records: 0 5 < 1 >

* Port: 3306

* Login Username:

* Password: 👁️ Test Connection

Remember Password Your password will be encrypted and stored securely.

Description:

Show Executed SQL Statements

Cancel **OK**

Table 2-2 Parameter description

Parameter	Description	Example Value
DB Engine	DB engine for the instance that you want to add login information for.	MySQL
Source Database	The following types of databases are supported: <ul style="list-style-type: none"> MySQL 5.5, 5.6, 5.7, and 8.0 instances. PostgreSQL 9.4, 9.5, 9.6, 10, 11 and 12 instances. SQL Server 2008, 2012, 2014, 2016, and 2017 instances are supported. HA clusters are not supported. 	ECS

Parameter	Description	Example Value
Port	<p>When Source Database is set to ECS, you need to enter a port number for the instance that you select.</p> <p>Ensure that the security group of the ECS allows access to this port. To avoid conflicts with reserved ports, you are advised to enter a port number ranging from 1024 to 65535.</p>	3306
Login Username	<p>Username for logging in to the selected DB instance.</p> <p>The user must have the permission to allow DAS to access the selected DB instance using an IP address.</p>	root
Password	<p>Password for logging in to the selected DB instance.</p> <p>You can select Remember Password. With this function enabled, you do not need to enter the password when you want to log in to the DB instance later.</p>	-
Description	This parameter is optional.	-
Show Executed SQL Statements	<p>If this function is enabled, all the SQL statements executed in the SQL window will be saved.</p> <p>You are advised to enable Show Executed SQL Statements. With it enabled, you can choose SQL Operations > SQL History to see what SQL statements you have executed and can re-execute any executed SQL statements rather than entering them again.</p>	Enabled

Step 7 After the DB instance information is configured, click **Test Connection** on the right of the password text box.

- If the connection test is successful, go to [Step 8](#).

- If a message is displayed indicating a connection test failure and failure causes, modify DB instance information based on the message and then go to [Step 8](#).

Step 8 After the connection test is successful, click **OK**.

Step 9 On the **My DB Instance Connections** tab page, view information about the new DB instance connection.

You can also click **Modify** in the **Operation** column to modify the connection information or click **Delete** to delete unnecessary connection information.

----End

2.2.2 Step 2: Logging In to an ECS-Hosted DB Instance

After creating a DB instance login, you can log in to, operate, and manage the instance on the DAS console.


Prerequisites

You have created a DB instance login. For details, see [Step 1: Adding DB Instance Login Information](#).

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

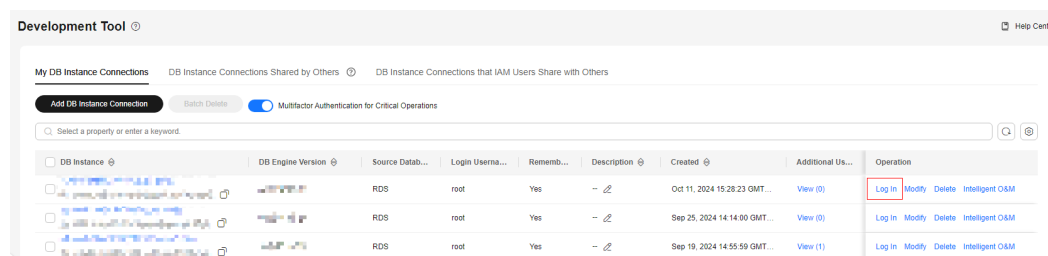
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.







Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the target DB instance and click **Log In** in the **Operation** column.

Figure 2-7 Database login information



DB Instance	DB Engine Version	Source Datab...	Login Userma...	Rememb...	Description	Created	Additional Us...	Operation
		RDS	root	Yes	-	Oct 11, 2024 15:28:23 GMT...	View (0)	Log In Modify Delete Intelligent O&M
		RDS	root	Yes	-	Sep 25, 2024 14:14:00 GMT...	View (0)	Log In Modify Delete Intelligent O&M
		RDS	root	Yes	-	Sep 19, 2024 14:55:59 GMT...	View (1)	Log In Modify Delete Intelligent O&M

----End

Reference

- [Differences Between IAM Permissions and Database Permissions](#)
- [How Do I Use DAS to Log In to a Database Using a Read-Only Account?](#)

2.3 Logging in to a DB Instance Shared by Others

2.3.1 Sharing a DB Instance with Others

If you have a DB instance and want to share it with another account or another user of the same account, but you do not want the account or user to know the password of the shared login or to view other DB instances in your account besides the shared one, you can choose to share the login details of one of your DB instances.

Prerequisites

- You have two accounts or one account with two IAM users.
- You have obtained IDs of the IAM users.


Usage Notes

- Users sharing your DB instance logins cannot add databases or users.
- Data tracking and rollback and background tasks are not available to the DB instances whose login information you have shared with other users.

Viewing the UID of the Shared Account

Step 1 [Log in to the management console](#) as an IAM user.

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

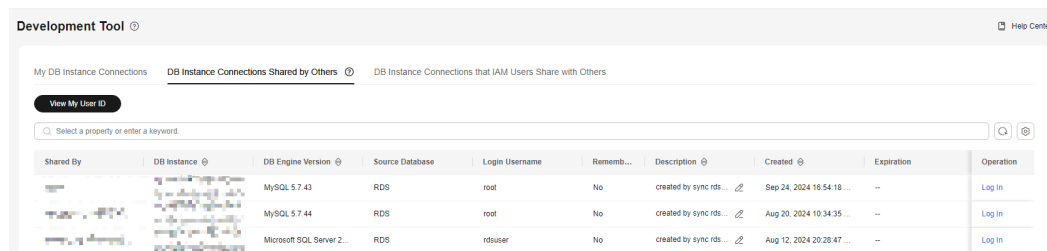
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Click the **DB Instance Connections Shared by Others** tab.

Figure 2-8 DB Instance Connections Shared by Others

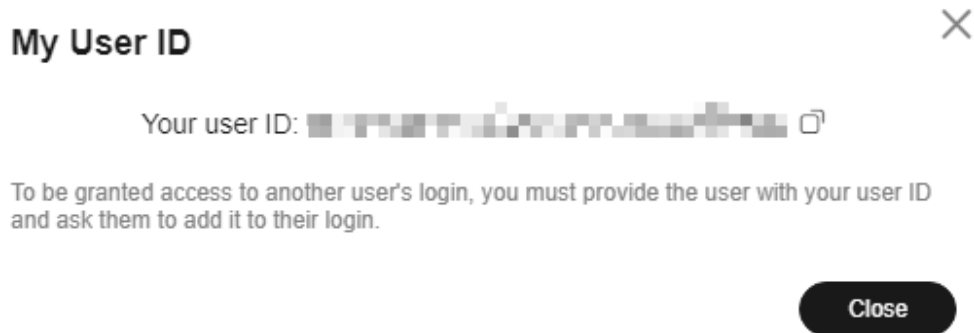


The screenshot shows the 'Development Tool' interface with the 'DB Instance Connections Shared by Others' tab selected. It displays a table with columns: Shared By, DB Instance, DB Engine Version, Source Database, Login Username, Rememb..., Description, Created, Expiration, and Operation. Three rows are visible, each with a 'Log In' button.

Shared By	DB Instance	DB Engine Version	Source Database	Login Username	Rememb...	Description	Created	Expiration	Operation
		MySQL 5.7.43	RDS	root	No	created by sync rds...	Sep 24, 2024 16:54:18...	--	Log In
		MySQL 5.7.44	RDS	root	No	created by sync rds...	Aug 20, 2024 19:34:35...	--	Log In
		Microsoft SQL Server 2...	RDS	rdsuser	No	created by sync rds...	Aug 12, 2024 20:28:47...	--	Log In

Step 6 Click **View My User ID**. On the displayed page, copy the user ID.

Figure 2-9 Viewing my user ID



----End

Sharing a DB Instance with Others



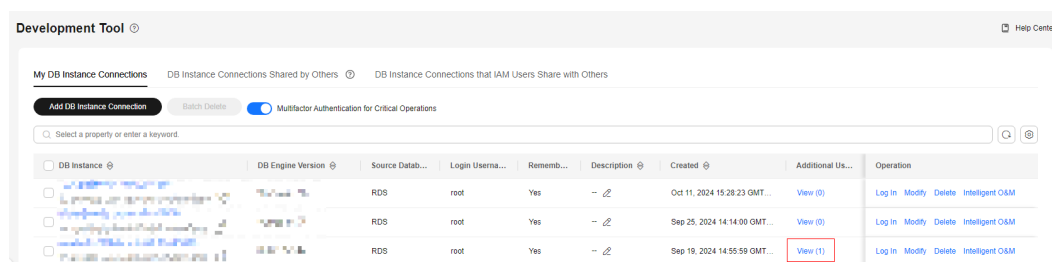
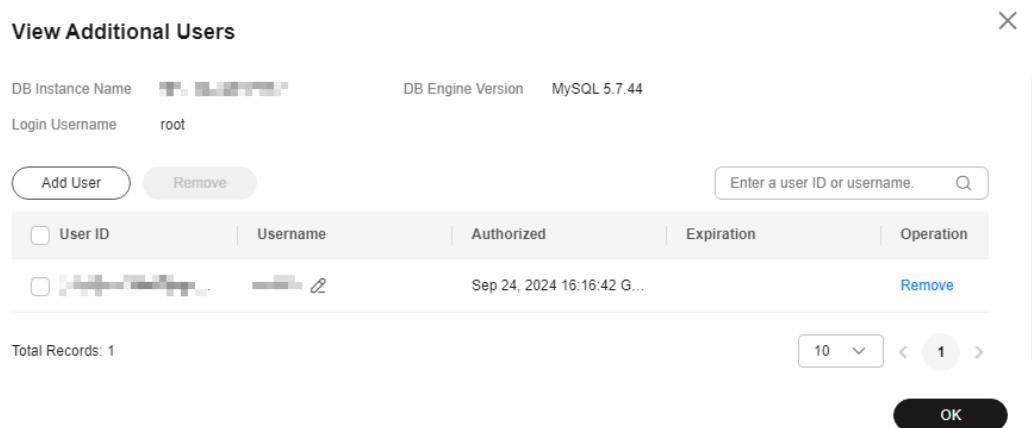
- Step 1** [Log in to the Huawei Cloud console](#) using a Huawei Cloud account.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** On the **My DB Instance Connections** tab, locate the DB instance you want to share and click the number in the **Additional Users** column.

Figure 2-10 Database list



- Step 6** On the displayed **View Additional Users** page, click **Add User**.

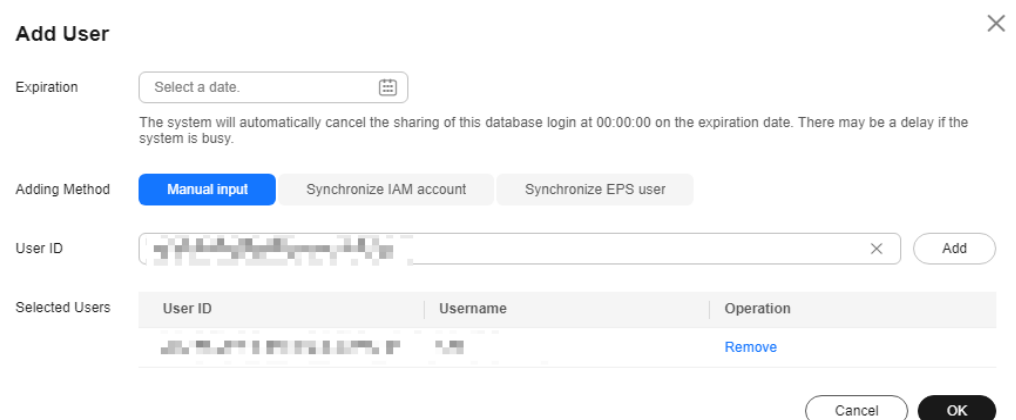
Figure 2-11 Viewing users of the shared login



Step 7 On the displayed **Add User** page, select an adding method.

- **Manual input:** Enter the ID of the user that you want to share your DB instance login with. If multiple users need to be added, separate their IDs with semicolons (;).

Figure 2-12 Manually entering a user



- **Synchronize IAM account:** Select another IAM user of the current account. You can also use the UID to quickly search for shared user information.

Figure 2-13 Synchronizing IAM users

Add User ✕

Expiration

The system will automatically cancel the sharing of this database login at 00:00:00 on the expiration date. There may be a delay if the system is busy.

Adding Method Manual input Synchronize IAM account Synchronize EPS user

Account

Users to Select

<input checked="" type="checkbox"/> User ID	Username
<input type="checkbox"/>	
<input type="checkbox"/>	
<input checked="" type="checkbox"/>	

⏪ ⏩

Selected Users

<input checked="" type="checkbox"/> User ID	Username
<input checked="" type="checkbox"/>	

- **Synchronize EPS user:** Specify an account and group and select required users.

Figure 2-14 Synchronizing EPS users

Step 8 Confirm the settings and click **OK**.

Step 9 Use the shared account to log in to the console and check whether the shared DB instance is displayed in the list on the **DB Instance Connections Shared by Others** tab page.

Figure 2-15 Successful addition

Shared By	DB Instance	DB Engine Version	Source Database	Login Username	Rememb...	Description	Created	Expiration	Operation
		MySQL 5.7.43	RDS	root	No	created by sync rds...	Sep 24, 2024 16:54:18...	--	Log In
		MySQL 5.7.44	RDS	root	No	created by sync rds...	Aug 20, 2024 10:34:35...	--	Log In
		Microsoft SQL Server 2...	RDS	rduser	No	created by sync rds...	Aug 12, 2024 20:28:47...	--	Log In


----End

2.3.2 Logging in to a DB Instance Shared by Others

This section describes how to log in to a DB Instance shared by others.

Step 1 [Log in to the management console](#) as an IAM user.

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

- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Click the **DB Instance Connections Shared by Others** tab.
- Step 6** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- End

2.3.3 Managing Login Information of DB Instances Shared by Others

After logging in to DAS using a Huawei Cloud account, you can view the login information of all DB instances shared by others under the account, including the sharer, sharee, shared DB instance, DB engine version, DB source, login username, and creation time.

Usage Notes

- This function is available only after you log in to DAS using a Huawei Cloud account.
- This function displays only the login information of shared DB instances that can be logged in to.

Procedure



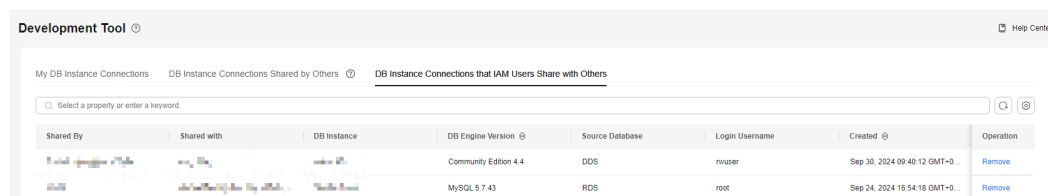






- Step 1** [Log in to the Huawei Cloud console](#) using a Huawei Cloud account.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Click **DB Instance Connections that IAM Users Share with Others** and view information about the shared DB instance.

Figure 2-16 Viewing the information about the shared DB instance



The screenshot shows the 'Development Tool' interface with the 'DB Instance Connections that IAM Users Share with Others' tab selected. A search bar is at the top, and a table lists shared instances. The table has columns for Shared By, Shared with, DB Instance, DB Engine Version, Source Database, Login Username, Created, and Operation.

Shared By	Shared with	DB Instance	DB Engine Version	Source Database	Login Username	Created	Operation
			Community Edition 4.4	DDS	root	Sep 30, 2024 09:40:12 GMT+0...	Remove
			MySQL 5.7.43	RDS	root	Sep 24, 2024 10:54:18 GMT+0...	Remove

- You can view the sharer, sharee, shared DB instance, DB engine version, DB source, login username, and creation time.
- You can also click **Remove** in the **Operation** column to cancel the sharing of the DB instance.

----End

3 MySQL

3.1 Account Management

3.1.1 Creating a Database User

Multiple users with different permissions can be created to access a DB instance or database, but the permissions of these users cannot exceed the operation permissions of the account.

Hidden Accounts

DAS can hide your RDS for MySQL instance accounts in [Table 3-1](#) to ensure that your database runs normally and to prevent your account details from being deleted by mistake.

Table 3-1 Accounts that DAS can hide

Account	Description
mysql.session@localhost	Internal database account configured in MySQL 5.7 or later.
mysql.sys@localhost	Internal database account configured in MySQL 5.7 or later.
mysql.infoschema@localhost	Internal database account.
root@%	Account configured when you create a MySQL instance.
rdsAdmin@localhost	Management account, which has the highest permission and is used to query and modify instance information, rectify faults, as well as migrate and restore data.
rdsBackup@localhost	Backup account, which is used for backend backup.

Account	Description
rdsMetric	Metering account, which is used by watchdog to collect database status data.
rdsRepl	Replication account, which is used to synchronize data from primary instances to standby instances or read replicas.
rdsProxy	Proxy account, which is used for authentication when a database is connected using a read/write splitting address. This account is automatically created when read/write splitting is enabled.
drsFull	Account added to the destination database when you start a full migration task on DRS.
drsIncremental	Account added to the destination database when you start an incremental migration task on DRS.

Usage Notes

For details about differences between IAM permissions and database permissions, see [Differences Between IAM Permissions and Database Permissions](#).

Creating a User



- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > User Management**.
- Step 7** Click **Create User**.

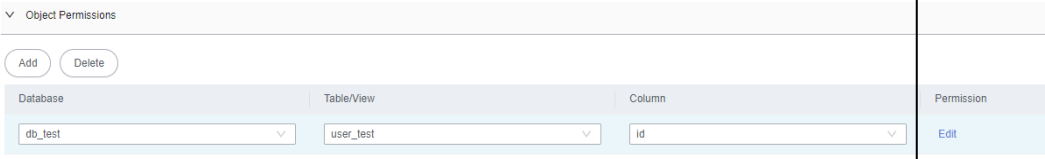
Figure 3-1 Creating a user

Configure required details, such as basic information, advanced settings, global permissions, object permissions, and roles by referring to [Table 3-2](#).

Table 3-2 Parameter description

Type	Parameter	Configuration Description
Basic Information	Username	Name of the new user.
	Host	<p>Whitelisted IP addresses allowed to access the database server.</p> <ul style="list-style-type: none"> If you leave this parameter blank or enter %, the user can access all IP addresses. If you enter multiple IP addresses, separate them with commas (.). For example, if you enter 192.%,193.% for Host, two users with host addresses of 192.% and 193.% will be created, respectively. You can click Add DAS IP Address to add a DAS server IP address to the user host.

Type	Parameter	Configuration Description
	Password	<p>Password of the user. The password:</p> <ul style="list-style-type: none"> • Can include 8 to 32 characters. • Contains at least three types of the following characters: lowercase letters, uppercase letters, digits, and special characters ~!@#%&^*-_+=?,&(). • Cannot be the username or the username spelled backwards. • Cannot be a weak password.
	Confirm Password	The value must be the same as the user password you set.
Advanced Settings	Max. Queries Per Hour	Maximum queries that this user can execute within an hour. If this parameter is left empty or set to 0 , there is no limit on the maximum queries.
	Max. Updates Per Hour	Maximum updates that this user can execute within an hour. If this parameter is left empty or set to 0 , there is no limit on the maximum updates.
	Max. Connections Per Hour	Maximum connections (of this user) to the DAS server within an hour. If this parameter is left empty or set to 0 , there is no limit on the maximum connections.
	Max. User Connections	Maximum concurrent connections to the server. If this parameter is left empty or set to 0 , there is no limit on the maximum concurrent connections.
	SSL Type	Type of certificates for authenticating user requests sent to the server.
	Issuer	Authority that issues X.509 certificates for connecting the user to the server.
	Subject	Subject of the X.509 certificates for connecting the user to the server.
	Algorithm	Method of encrypting connections between the user and the server.
Global Permissions	<p>Permissions granted to the user to perform operations on all databases in the current instance.</p> <p>For details about the global permissions that can be configured, see Table 3-3. For details about permission usages and explanations, visit the official website.</p>	

Type	Parameter	Configuration Description
Object Permissions		<p>Permissions granted to the user on specific objects.</p> <p>For details about the object permissions that can be configured, see Table 3-3. For details about permission usages and explanations, visit the official website.</p> <p>Example:</p> <p>The following settings grant the user the permission to query the ID of table user_test in database db_test.</p> <p>Figure 3-2 Adding an object permission</p>  <p>On the Object Permissions tab, you can add or delete object permissions and click Save. In the displayed dialog box, click OK.</p>

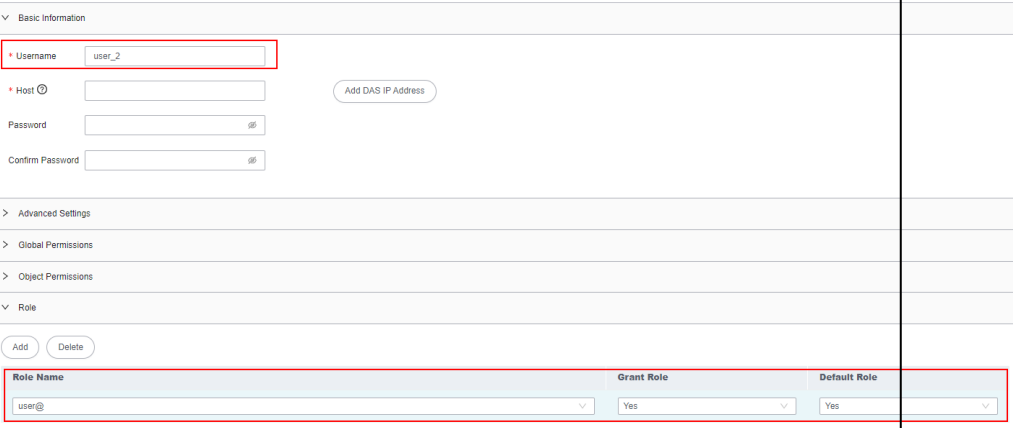
Type	Parameter	Configuration Description
Role		<p>Role of the user. Roles are only supported for MySQL 8.0.</p> <ul style="list-style-type: none"> • Role Name: You can select an existing username in this instance. • Grant Role: Whether the new user can grant permissions of the selected role to another user. • Default Role: Whether the new user can inherit permissions of the selected role. <p>NOTE To manage roles, the current account must have the ROLE_ADMIN permission. You can manually assign the permission. For example, you can run the GRANT ROLE_ADMIN on *.* TO 'root'@' %' command to assign the ROLE_ADMIN permission to user root.</p> <p>Example: The following settings indicate that user_2 can inherit permissions of user@ and can grant permissions of user@ to another user.</p> <p>Figure 3-3 Granting permissions</p>  <p>The screenshot shows a web interface for configuring a user. Under the 'Role' section, there are three dropdown menus: 'Role Name' (set to 'user@'), 'Grant Role' (set to 'Yes'), and 'Default Role' (set to 'Yes'). Red boxes highlight the 'Role Name' dropdown and the 'Grant Role' and 'Default Role' dropdowns.</p>

Table 3-3 Permission description

Permission	Description
SELECT	Permission to query a specified object, for example, a global or single database.
INSERT	Permission to insert data into a specified object.
UPDATE	Permission to update data of a specified object.
DELETE	Permission to delete data from a specified object.
CREATE	Permission to create databases and tables for a specified object.

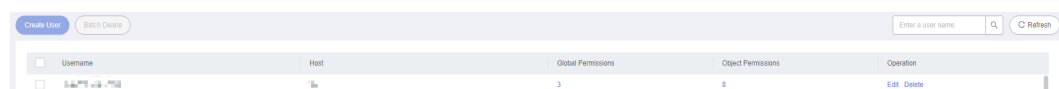
Permission	Description
DROP	Permission to delete databases, tables, and views from a specified object.
RELOAD	Permission to execute FLUSH .
PROCESS	Permission to execute SHOW PROCESSLIST to view all the processes.
GRANT	Permission to grant a specified object the permissions of another account or reclaim permissions from other accounts.
REFERENCES	Permission to create foreign keys for a specified object.
INDEX	Permission to create or delete an index for a specified object.
ALTER	Permission to execute ALTER TABLE for a specified object.
SHOW DATABASES	Permission to run SHOW DATABASES to show all databases.
CREATE TEMPORARY TABLES	Permission to execute CREATE TEMPORARY TABLE for a specified object.
LOCK TABLES	Permission to execute LOCK TABLES on the tables with the SELECT permission for a specified object.
EXECUTE	Permission to execute a stored procedure for a specified object.
REPLICATION SLAVE	Permission to allow the replica server to read binary log events from the source server.
REPLICATION CLIENT	Permission to query locations of the source server or replica server.
CREATE VIEW	Permission to create or alter a view for a specified object.
SHOW VIEW	Permission to execute SHOW CREATE VIEW for a specified object.
CREATE ROUTINE	Permission to create a stored procedure for a specified object.
ALTER ROUTINE	Permission to alter or delete a stored procedure for a specified object.
CREATE USER	Permission to execute CREATE USER , DROP USER , RENAME USER , and REVOKE ALL PRIVILEGES for a specified object.
EVENT	Permission to create, modify, delete, or display the event scheduler for a specified object.

Permission	Description
TRIGGER	Permission to execute a trigger for a specified object. Only users with this permission can create, delete, execute, or display triggers of a table.

Step 8 After configuring required parameters, click **Save**. In the preview dialog box, click **OK**.

Step 9 After the user is created, check whether the user is displayed in the user list.

Figure 3-4 Viewing user information



----End

3.1.2 Editing a Database User

This section describes how to edit user information, including the username, password, global permissions, object permissions, advanced settings, and roles.


Usage Notes

Improper database user settings will cause instance or service exceptions.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Account Management > User Management**.

Step 7 In the user list, locate the user whose information you want to edit and click **Edit** in the **Operation** column.

Figure 3-5 Editing user information

Back to User Management List / Edit User - [User Name]

Basic Information

* Username

* Host

* Password

* Confirm Password

> Advanced Settings

> Global Permissions

> Object Permissions

- Permissions for multiple users cannot be modified at the same time. For example, if two users with the same username and different host addresses of 192.% and 193.% are created, modifying permissions of the user with the host address of 1192.% does not affect permissions of the other user.
- When you edit a user, adding host addresses to the user does not create multiple users. For example, if a user already has a host address, 192.%, adding host address 194.% to it does not create another user with the host address of 194.%. This operation only changes the host address of the user from 192.% to 192.%,194.%.

Username	Host	Global Permissions	Object Permissions	Operation
user001	192.%,194.%	1	0	Edit Delete

- For details about how to configure other parameters, see [Table 3-2 in Creating a Database User](#).

Step 8 After configuring required parameters, click **Save**. In the preview dialog box, click **OK**.

----End



3.1.3 Deleting a Database User

This section describes how to delete a user that is no longer needed.

Precautions

Deleted users cannot be recovered. Exercise caution when performing this operation.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > User Management**.
- Step 7** In the user list, locate the user that you want to delete and click **Delete** in the **Operation** column.
- Step 8** In the displayed dialog box, click **Yes**.

----End

3.2 Database Management



3.2.1 Creating a Database

This section describes how to create a database on the DAS console.

Precautions

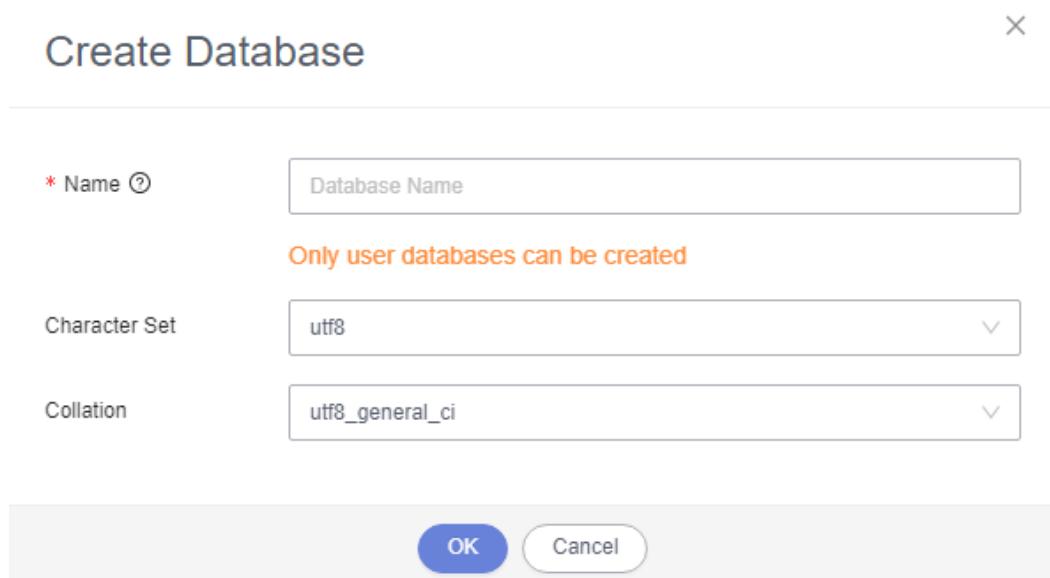
The `__recyclebin__` database of RDS for MySQL instances is newly added for internal test and does not occupy storage space.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.

- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the home page, click **Create Database** above the database list.
- Step 7** On the displayed page, enter a database name and select a character set.

Figure 3-6 Creating a database



Create Database ×

* Name ⓘ Database Name

Only user databases can be created

Character Set utf8 ▾

Collation utf8_general_ci ▾

OK Cancel

- Step 8** After settings are complete, click **OK**. View the created database in the database list.

----End



3.2.2 Dropping a Database

This section describes how to drop a database that is no longer needed.

Precautions

Dropped databases cannot be recovered. Exercise caution when performing this operation.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.

- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** In the database list, locate the database you want to drop and choose **More > Drop** in the **Operation** column.
- Step 7** In the displayed dialog box, click **Yes**.
- End

3.2.3 Viewing Data Dictionary of a Database

A data dictionary is a collection of information that describes data, including the database name, database character set, table name, table size, number of records in a table, table character set, table field, table index, table description, field type, field precision, and field description.

You can view data dictionary of a database on the DAS console or download the PDF file to your local PC.

Prerequisites

There are available tables in the current database.

Procedure



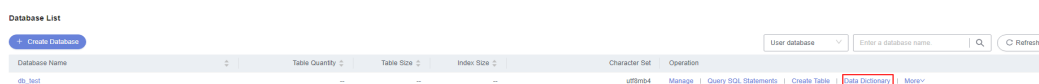
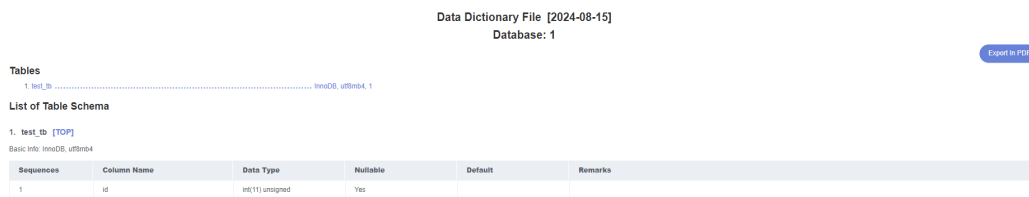
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** In the database list, locate the database whose data dictionary you want to view and click **Data Dictionary** in the **Operation** column.

Figure 3-7 Homepage



- Step 7** On the displayed page, view the content in **Tables** and **List of Table Schema** of the current database.

Figure 3-8 Data dictionary file



Step 8 Click **Export In PDF** to download it to your local PC if needed.

----End

3.3 SQL Operations

3.3.1 SQL Window

DAS allows you to run various SQL statements in the graphical SQL window, helping you easily manage databases.

Introduction to SQL Window

Figure 3-9 SQL window

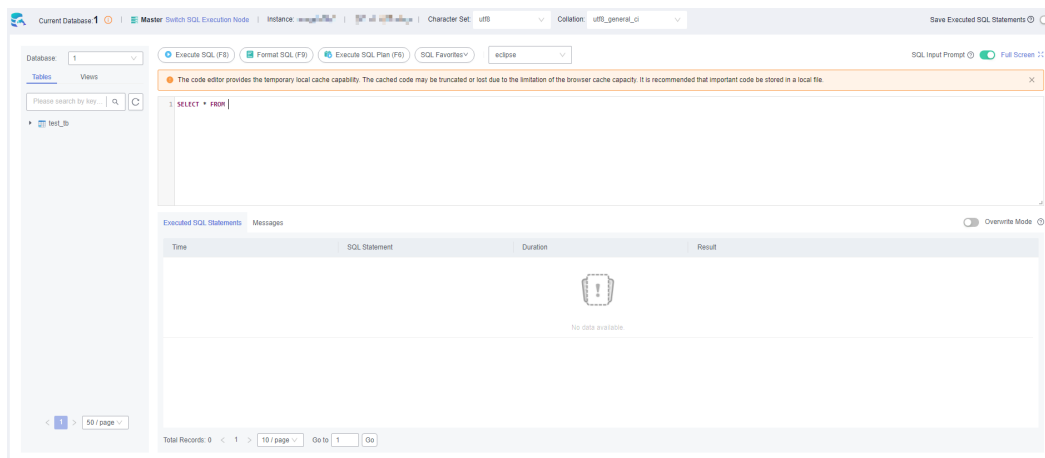


Table 3-4 Function description


Function	Description
Execute SQL	Executes SQL statements. SQL operations are performed on tables and views in a database.
Format SQL	Improves readability of SQL statements. Formatting SQL statements enables statements to be displayed in line break mode, but does not change their logic and semantics. SQL formatting takes effect for all the SQL statements in the SQL window. You cannot format one selected statement.

Function	Description
Execute SQL Plan	Reports execution of SQL statements to make troubleshooting easy and optimize SQL processing performance.
SQL Favorites	Allows you to add, view, and manage frequently-used SQL statements.
Save Executed SQL Statements	After this function is enabled, the system saves the recently executed SQL statements to the server.
SQL Input Prompt	Helps you quickly enter a specific database, table, or field name when you enter a SQL statement in the SQL window.
Full Screen	Shows SQL statements on a full screen.
Executed SQL Statements	Shows SQL execution details.
Messages	Shows the information returned after a SQL statement is executed.
Result Set	Shows SQL execution results. Allows you to view details about a single row, add a row, submit for editing, delete a row, export a row, copy a row, copy a column, set a column, and more.
Overwrite/Append Mode	<ul style="list-style-type: none">● Append Mode: Each time a SQL statement is executed, the new result set is appended to the previous one.● Overwrite Mode: Each time a SQL statement is executed, the new result set overwrites the previous one.

Opening the SQL Window

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

----End

3.3.2 Executing SQL Statements

This section describes how to execute various SQL statements.

Procedure



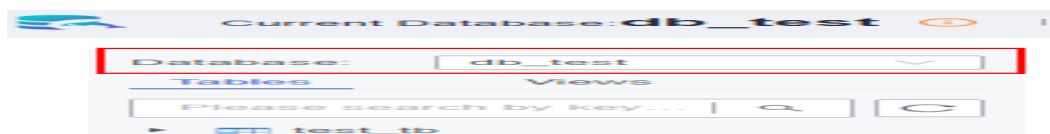
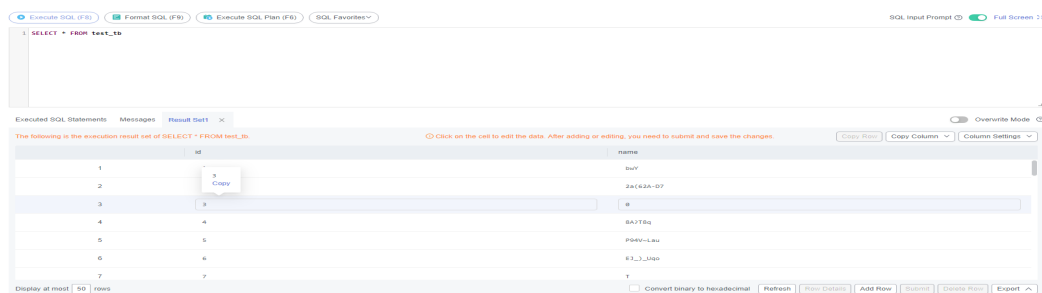
- Step 1** Log in to the Huawei Cloud console.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- Step 7** In the upper left corner of the page, select a database from the drop-down list.

Figure 3-10 Selecting a database



- Step 8** Enter a SQL statement in the SQL window and click **Execute SQL**.

Figure 3-11 Executing a SQL Statement

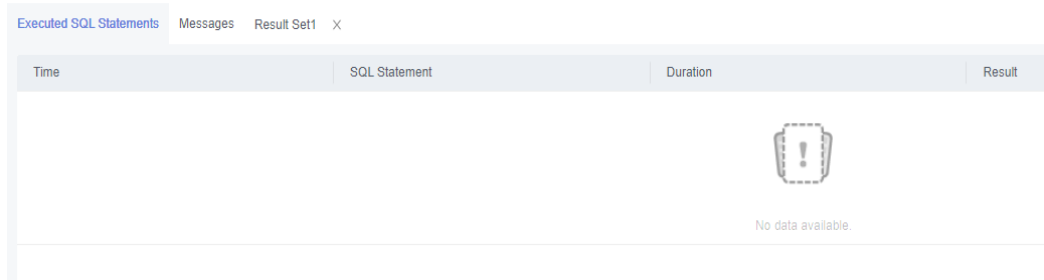


- Enabling **SQL Input Prompt** is recommended. It helps you select the required database, table, or field name when you enter a SQL statement in the SQL window.
- To protect query result sets from being displayed as garbled characters, select an encoding format other than the default encoding format, UTF-8.
- You can execute multiple SQL statements at a time. Separate them using semicolons (;). You can click **Full Screen** to view logics in SQL statements clearly.
 - To execute some of the SQL statements, select the statements before executing them.

- To execute all SQL statements, do not select any SQL statements or select all SQL statements.

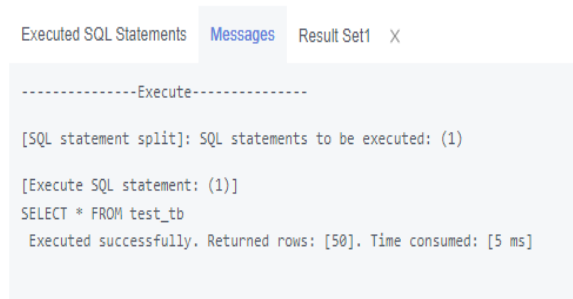
Step 9 View execution details of the current SQL statement and previously executed SQL statements in the lower part of the page.

Figure 3-12 Viewing execution records



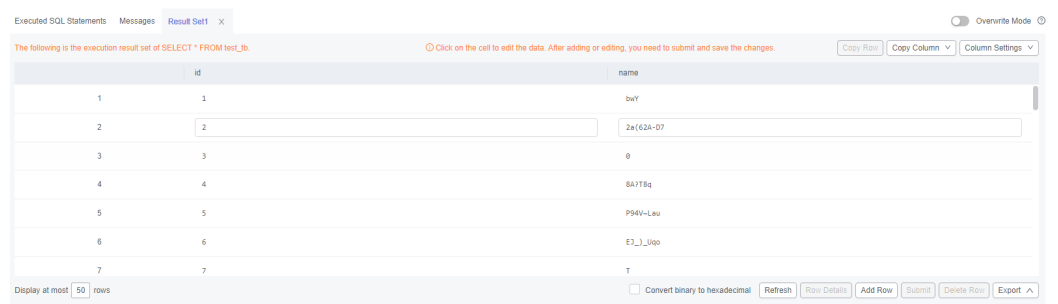
Step 10 Click the **Messages** tab, view SQL execution details, including affected rows, progress, and time required.

Figure 3-13 Viewing messages



Step 11 On the **Result Set** tab, view SQL execution results.

Figure 3-14 Viewing result sets



You can also perform the operations described in [Table 3-5](#) on result sets.

Table 3-5 Operations

Function	Description
Copy Row and Copy Column	Copies a row or column for reuse.
Column Settings	Customizes the display of columns when there are a number of columns in the query result.
Convert binary to hexadecimal	Converts binary data in the result set into hexadecimal data for display.
Refresh	Refreshes changed data.
Row Details	Displays the column field name, type, and data of the selected row.
Add Row	Adds an empty row to the result set.
Submit	Allows you to view the SQL statements to be modified. After you click OK , the result set is updated.
Delete Row	Deletes the selected row, including data.
Export	The SQL, CSV, and Excel files are supported. No more than 7.84 MB of data with 10,000 records can be exported. The actual size of an Excel file may exceed 7.84 MB due to its format.
Export More	Redirects you to the data export page and allows you to export over 10,000 rows of data.

 NOTE

- If the result set involves a view, data in the result set cannot be edited.
- If the type of the result set is metadata, the data cannot be edited or displayed on multiple pages.
- If the result set involves multiple tables, data in the result set cannot be edited.
- If only one table is in the result set and does not contain all primary key columns or any primary keys, you cannot edit the data.
- Data in virtual tables (for example, tables generated during execution of a stored procedure) cannot be edited.

----End

3.3.3 SQL Execution Plan

This section describes how to analyze the execution efficiency of a SQL statement.

Procedure



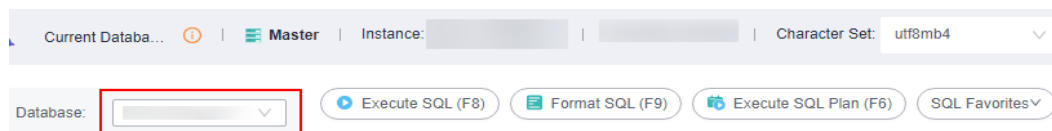
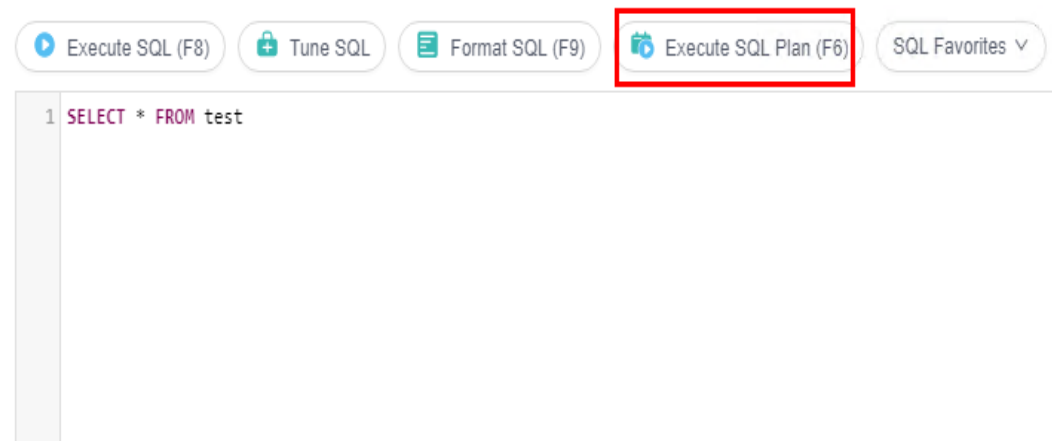
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- Step 7** Select a database in the upper left corner of the page.

Figure 3-15 Selecting a database



- Step 8** Enter a SQL statement in the SQL window and click **Execute SQL Plan**.

Figure 3-16 Executing SQL plan



- On the **Executed SQL Statements** tab page, view SQL execution history.
- On the **Messages** tab page, view the execution information, including SQL splitting, execution status, and time required.
- On the **Execution Plan** tab page, view SQL execution details. Execution plan details of SQL statements are displayed on different tabs.

----End

3.3.4 SQL Favorites

This section describes how to add frequently-used SQL statements and view and manage them.

Procedure



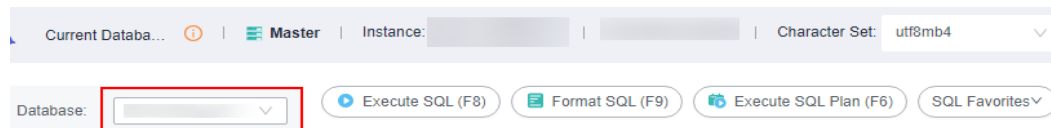
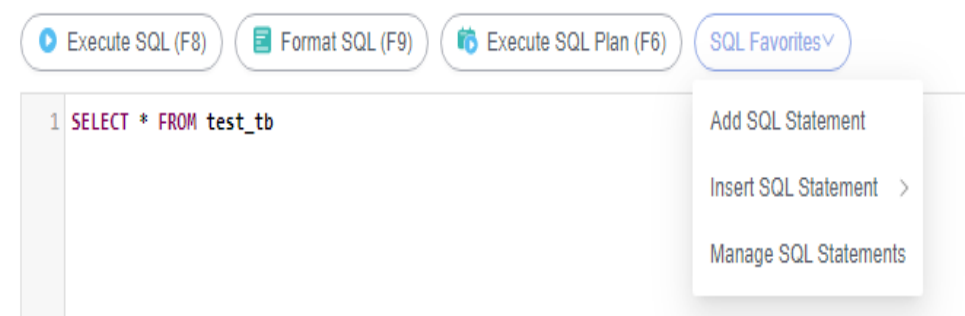
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- Step 7** Select a database in the upper left corner of the page.

Figure 3-17 Selecting a database



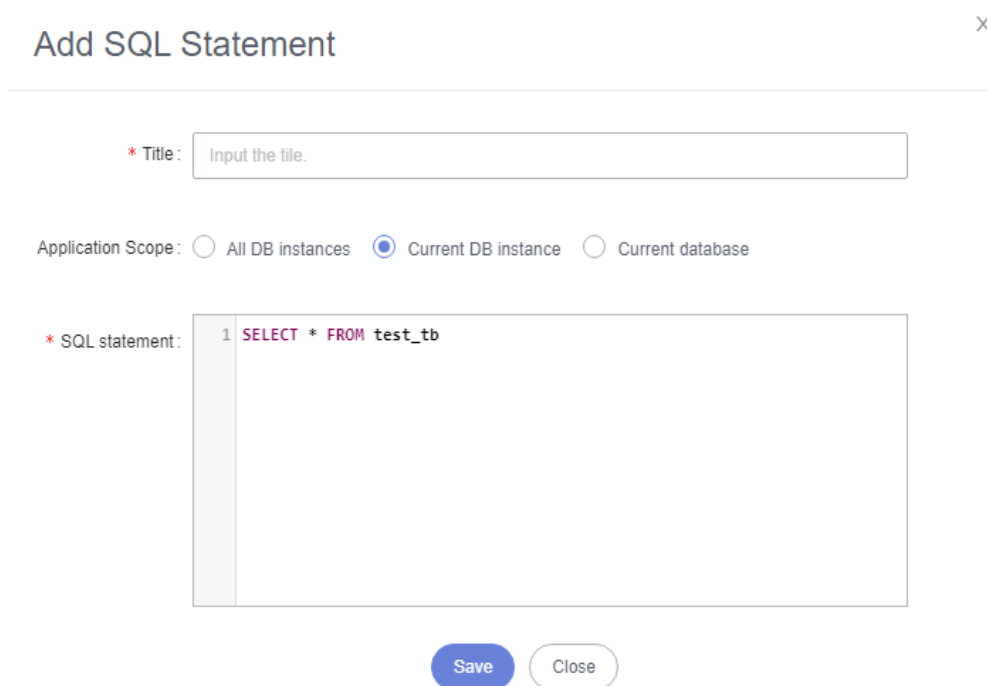
- Step 8** Choose **SQL Favorites**.

Figure 3-18 SQL favorites



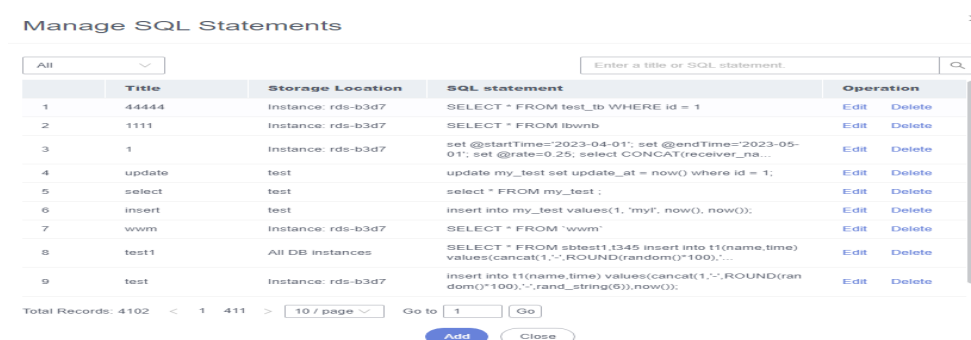
- **Add SQL Statement:** allows you to add frequently-used SQL statements. Specifically, specify a title, select an application scope, enter SQL statements, and then click **Save**.

Figure 3-19 Adding a SQL statement



- **Insert SQL Statement:** allows you to view the SQL statements you have added. If there are no SQL statements stored in your account, this option will not be displayed.
- **Manage SQL Statements:** allows you to manage your SQL statements, including adding, editing, and deleting statements.

Figure 3-20 Managing SQL statements



----End

3.3.5 SQL History

After you toggle on **Save Executed SQL Statements**, DAS will save the SQL statements you executed in the SQL window for future view. You can also execute the SQL statements again with no need to enter them again in the SQL window.

Prerequisites

You have enabled **Save Executed SQL Statements** in the upper right corner of the **SQL Query** page. After this function is enabled, executed SQL statements will be saved on the DAS management host.

Constraints on Usage

SQL statement execution records can be stored for up to one year.

Procedure



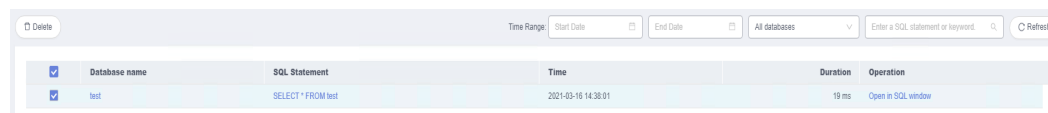
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL History**.
- Step 7** On the displayed page, search for execution information about the target SQL statement by time range, database name, or keyword.

Figure 3-21 SQL history



Database name	SQL Statement	Time	Duration	Operation
test	SELECT * FROM test	2021-03-16 14:38:01	19 ms	Open in SQL window

- To access the **Database Management** page, click a database name.
- To copy a SQL statement, click it in the **SQL Statement** column.
- To execute a SQL statement, click **Open in SQL window** in the **Operation** column.

----End

3.4 Table Management

3.4.1 Creating a Table

A data table consists of basic information, columns, generated columns, indexes, and foreign keys, among which generated columns, indexes, and foreign keys are optional. Configure these items as required.

Procedure



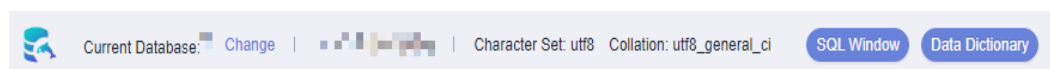
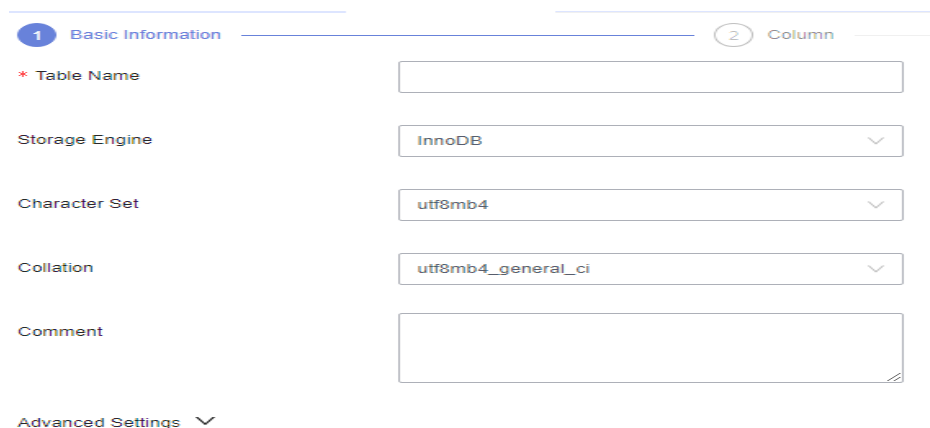
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-22 Switching to another database



- Step 8** On the **Objects** tab page, choose **Tables**.
- Step 9** Click **Create Table**.
- Step 10** Configure basic information as follows:
Enter a table name, specify the storage engine, character set, collation, and enter a comment in sequence. The table name is mandatory.

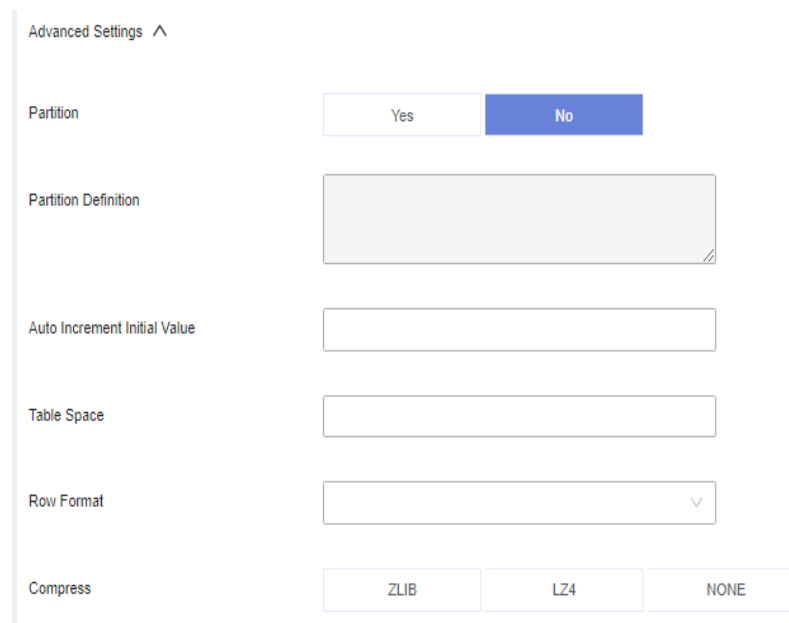
Figure 3-23 Basic information

The screenshot shows a form with two tabs: 'Basic Information' (active) and 'Column'. The form contains the following fields:

- * Table Name**: A text input field.
- Storage Engine**: A dropdown menu with 'InnoDB' selected.
- Character Set**: A dropdown menu with 'utf8mb4' selected.
- Collation**: A dropdown menu with 'utf8mb4_general_ci' selected.
- Comment**: A text area.

At the bottom, there is an 'Advanced Settings' dropdown menu.

- Step 11** (Optional) Configure advanced settings.
Specify parameters based on service requirements.

Figure 3-24 Advanced settings

Advanced Settings ^

Partition

Partition Definition

Auto Increment Initial Value

Table Space

Row Format

Compress

To learn more about partitioned tables, see the following note:

Table partitioning is used to divide a large table into several small tables based on conditions. Different rows in the table can be allocated to different physical partitions. Creating a partitioned table is not recommended because there are many constraints on MySQL partitioned tables.

If you need to create a partitioned table, you can create one by referring to the following example. The supported partitioning methods are RANGE, LIST, COLUMNS, KEY, and HASH.

For example, if you want to create partitioned table **employees**, enter the following content for **Partition Definition**:

Creating a partitioned table:

```
CREATE TABLE employees (  
id INT NOT NULL,  
fname VARCHAR(30),  
lname VARCHAR(30),  
hired DATE NOT NULL DEFAULT '1970-01-01',  
separated DATE NOT NULL DEFAULT '9999-12-31',  
job_code INT NOT NULL,  
store_id INT NOT NULL  
)  
PARTITION BY RANGE (store_id) (  
PARTITION p0 VALUES LESS THAN (6),  
PARTITION p1 VALUES LESS THAN (11),  
PARTITION p2 VALUES LESS THAN (16),  
PARTITION p3 VALUES LESS THAN (21)  
);
```

Specifying a partition definition:

```
PARTITION BY RANGE (store_id) (  
PARTITION p0 VALUES LESS THAN (6),  
PARTITION p1 VALUES LESS THAN (11),
```

```
PARTITION p2 VALUES LESS THAN (16),  
PARTITION p3 VALUES LESS THAN (21)  
)
```

Step 12 Click **Next**.

Step 13 On the **Column** page, click **Add**.

- Set **Column Name**, **Type**, **Length**, **Nullable**, **Primary Key**, **Comment**, and **Extended Information** as needed.

 **NOTE**

- The length of a column name is limited. Enter no more than 64 characters for the MySQL engine.
 - In the **Type** column, you can select only the parameters from the drop-down list box.
 - In the **Length** column, retain the default value. For some columns whose length is variable, you can change their lengths.
 - If **Primary Key** is selected, **Nullable** will be grayed out.
 - **Auto Increment** can be set for one column only. When it is selected, **Primary Key** must be selected, and no default values can be set.
- If you do not need to add generated columns, indexes, or foreign keys, click **Create**.

 **NOTE**

- Only MySQL 5.6.5 and later versions support default DATETIME values.
 - In versions earlier than MySQL 5.6.5, leave default values blank. Otherwise, an error may occur.
- If you need to add generated columns, indexes, and foreign keys, click **Next** until all your desired parameters are specified. After the setting is complete, click **Create**.

 **NOTE**

When you create a foreign key, the type of columns in the referenced table must be the same as that of included columns, and must be the primary key or have a unique index.

Step 14 In the **SQL Preview** dialog box, click **Execute**.

----End


3.4.2 Opening a Table

If a table has primary keys, you can add, delete, modify, or query table data as you do in Excel.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

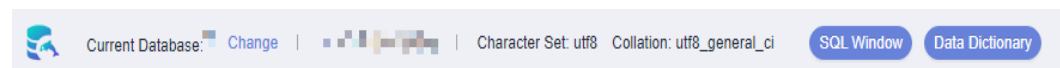
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-25 Switching to another database



Step 8 On the displayed **Objects** tab, choose **Tables** on the left.

Step 9 In the table list, locate the table you want to open and click **Open** in the **Operation** column.

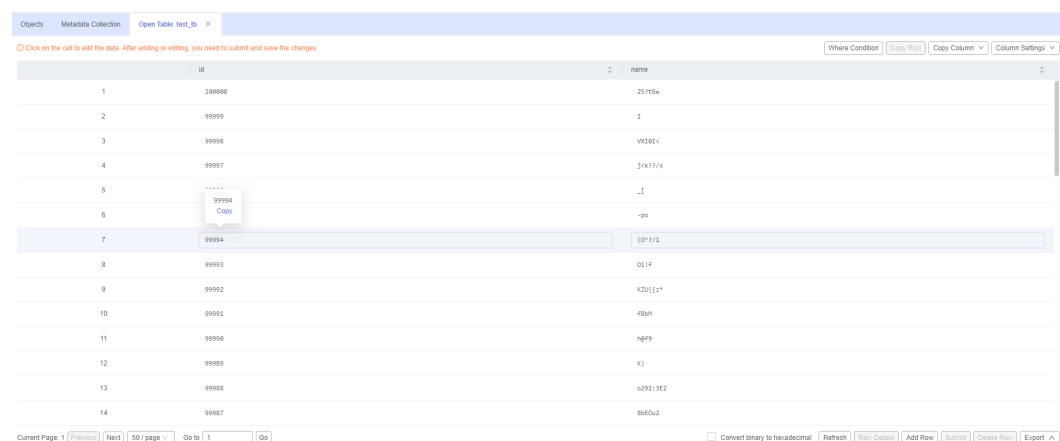
Figure 3-26 Opening a table



Step 10 On the displayed page, view table details.

On the table details page, click a cell to edit data. After adding or editing data, click **Submit** to save the changes.

Figure 3-27 Editing table data



You can also perform operations described in **Table 3-6** on the table.

Table 3-6 UI operations

Name	Description
Where Condition	Filters records.
Copy Row	Copies data of the selected row. Specifically, double-click the target row and then click Copy Row .
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.
Column Settings	Allows you to set the columns you want to display.
Convert binary to hexadecimal	Prevents binary data in columns from being displayed as garbled characters. If there is binary data in columns, you must select this option.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.
Add Row	Allows you to add rows.
Submit	Allows you to submit and save the changes to data.
Delete Row	Allows you to delete the selected rows.
Export	Exports a maximum of 10,000 data records to a CSV or SQL file.

----End

3.4.3 Viewing Details of a Table

This section describes how to view basic information of a table and the SQL statement for creating this table.

Procedure



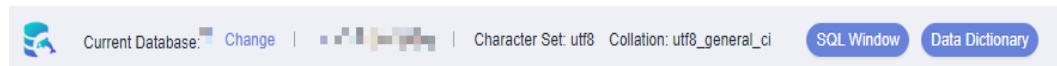
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-28 Switching to another database



Step 8 On the displayed **Objects** tab, choose **Tables** on the left.

Step 9 In the table list, locate the table whose details you want to view and click **View** in the **Operation** column.

Figure 3-29 Viewing details of a table



Step 10 In the displayed dialog box, view basic information of the table and SQL statements for creating the database.

Figure 3-30 Viewing details of the table

View Table

Basic Information
DDL

	Column Name	Value
1	Database	test
2	Table Name	test
3	Row Count	0(Estimated)
4	Data Length	16KB
5	Index Length	0B
6	Character Set	utf8mb4
7	Collation	utf8mb4_general_ci
8	Row Format	Dynamic
9	Created	2021-03-16 14:36:32

Close

----End

3.4.4 Altering a Table

After a table is created, you can alter information of the table, including basic information, columns, generated columns, indexes, and foreign keys.

Usage Notes

Improper alterations on a table will cause instance or service exceptions.

Procedure



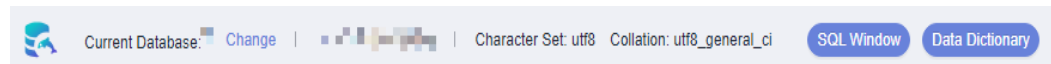
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-31 Switching to another database



- Step 8** On the displayed **Objects** tab, choose **Tables** on the left.
- Step 9** In the table list, locate the table you want to alter and click **Alter** in the **Operation** column.

Figure 3-32 Table list

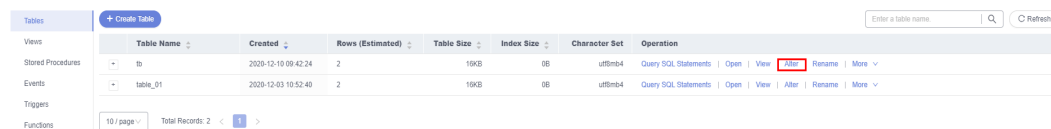
The screenshot shows a table list with columns: Table Name, Created, Rows (Estimated), Table Size, Index Size, Character Set, and Operation. The 'table_01' row has an 'Alter' button highlighted in red in the Operation column.

	Table Name	Created	Rows (Estimated)	Table Size	Index Size	Character Set	Operation
Views							
Stored Procedures	ts	2020-12-10 09:42:24	2	19KB	0B	utf8mb4	Query SQL Statements Open View Alter Rename More
Events	table_01	2020-12-03 10:52:40	2	19KB	0B	utf8mb4	Query SQL Statements Open View Alter Rename More
Triggers							
Functions							

- Step 10** Alter the table information as required. For details, see [Creating a Table](#).

Figure 3-33 Altering table settings

The screenshot shows a web-based interface for altering table settings. At the top, there are five tabs: 'Basic Information' (selected), 'Column', 'Generated Column(Optional)', 'Index(Optional)', and 'Foreign Keys(Optional)'. Under the 'Basic Information' tab, there are several input fields: 'Table Name' with the value 'test', 'Storage Engine' with a dropdown menu showing 'InnoDB', 'Character Set' with a dropdown menu showing 'utf8mb4', 'Collation' with a dropdown menu showing 'utf8mb4_unicode_ci', and a 'Comment' text area. Below these fields is an 'Advanced Settings' dropdown menu. At the bottom of the interface, there is a 'Next' button.

Step 11 After the alteration is complete, click **Alter**.

Step 12 In the **SQL Preview** dialog box, click **Execute**.

----End


3.4.5 Renaming a Table

This section describes how to rename a created table.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

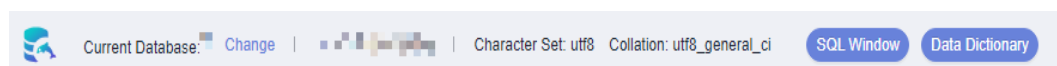
Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-34 Switching to another database

Step 8 On the displayed **Objects** tab, choose **Tables** on the left.

Step 9 In the table list, locate the table that you want to rename and click **Rename** in the **Operation** column.

Figure 3-35 Renaming a table

Table Name	Created	Rows(Estimated)	Table Size(Estimated)	Index Size(Estimated)	Character Set	Operation
test_tb	2023-07-13 10:55:06	1005003(Estimated)	88.56MB(Estimated)	0B(Estimated)	utf8mb4	Query SQL Statements Open View Alter Rename More

10 / page Total Records: 1 < 1 >

Step 10 In the displayed dialog box, enter a new table name and click **OK**.

Figure 3-36 Renaming a table

Rename Table

Old Name:

* New Name:

OK Cancel

----End



3.4.6 Dropping a Table

This section describes how to drop a table that is no longer needed.

Usage Notes

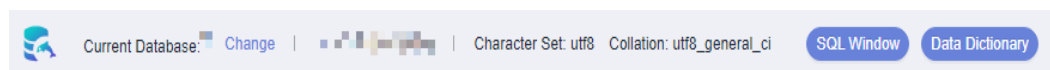
Dropped tables cannot be recovered. Exercise caution when performing this operation.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-37 Switching to another database



Step 8 On the displayed **Objects** tab, choose **Tables** on the left.

Step 9 In the table list, locate the table that you want to drop and choose **More > Drop** in the **Operation** column.

Figure 3-38 Dropping a table

Table Name	Created	Rows(Estimated)	Table Size(Estimated)	Index Size(Estimated)	Character Set	Operation
test_db	2023-07-13 10:55:06	1005003(Estimated)	88.56MB(Estimated)	0B(Estimated)	utf8mb4	Query SQL Statements Open View Alter Rename More

10 / page Total Records: 1 < 1 >

Drop
Clear
Maintain >

Step 10 In the displayed dialog box, click **Yes**.

----End

3.4.7 Clearing a Table

This section describes how to clear data in a table.


Usage Notes

Cleared tables cannot be recovered. Exercise caution when performing this operation.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

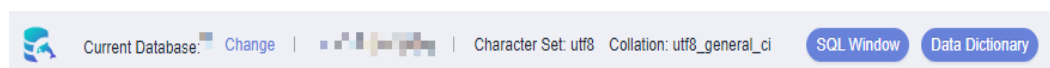
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-39 Switching to another database



Step 8 On the displayed **Objects** tab, choose **Tables** on the left.

Step 9 In the table list, locate the table whose data you want to clear and choose **More > Clear** in the **Operation** column.

Figure 3-40 Clearing a table

Table Name	Created	Rows(Estimated)	Table Size(Estimated)	Index Size(Estimated)	Character Set	Operation
test_tb	2023-07-13 10:55:06	1005003(Estimated)	88.56MB(Estimated)	0B(Estimated)	utf8mb4	Query SQL Statements Open View Alter Rename More

Step 10 In the displayed dialog box, click **Yes**.

----End

3.4.8 Maintaining a Table

While working with MySQL databases, you do a lot of changes such as data insert, update, and deletion, which may cause table fragmentation. As a result, the database server performance is deteriorated. To handle this, periodic maintenance is required.

Functions

Table 3-7 Function description

Function	Description
Check	<p>Allows you to check whether there are errors in database tables using the CHECK TABLE statement. You can check a table with any of the following methods: Check, Quick, Fast, Changed, and Extended. The CHECK TABLE statement adds a read-only lock to the table.</p> <ul style="list-style-type: none"> • Check: scans rows to verify that deleted links are valid. Alternatively, calculate a key checksum for the rows and verifies the validity using the obtained checksum. • Quick: checks only tables that have not been closed properly. • Fast: neither scans rows nor checks for incorrect links. • Changed: checks only the tables that have been changed since the last check and the tables that have not been closed properly. • Extended: searches for keywords in each row. This ensures that the table is 100% consistent, but takes a long time.

Function	Description
Repair	<p>Allows you to use the REPAIR TABLE statement to repair possibly corrupted or incorrect tables. You can repair tables using any of the following three methods: Check, Quick, and Extended.</p> <ul style="list-style-type: none"> • Check: a simple repair, which repairs data and index files. • Quick: the quickest repair, which repairs only index files, but not data files. • Extended: the slowest repair, which creates indexes row by row to repair data and index files.

Checking a Table



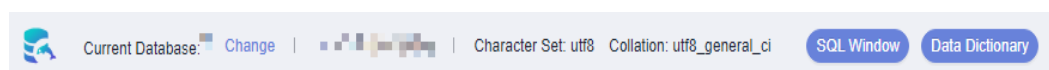

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-41 Switching to another database



- Step 8** On the displayed **Objects** tab, choose **Tables** on the left.
- Step 9** Locate the table you want to check and choose **More > Maintain > Check** in the **Operation** column.

Figure 3-42 Checking a table

Table Name	Created	Rows(Estimated)	Table Size(Estimated)	Index Size(Estimated)	Character Set	Operation
+ test_tb	2023-07-13 10:55:06	1005003(Estimated)	88.56MB(Estimated)	0B(Estimated)	utf8mb4	Query SQL Statements Open View Alter Rename More 

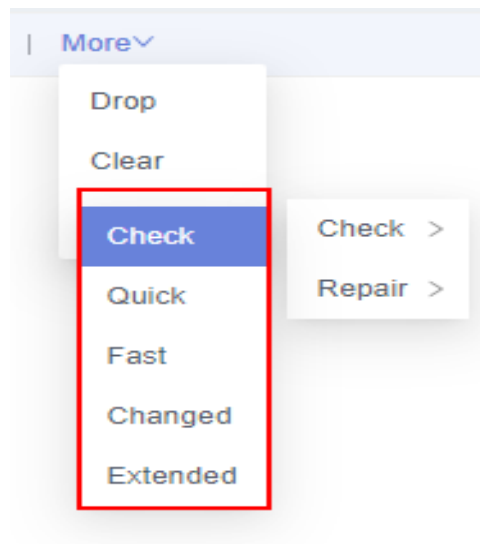
10 / page v Total Records: 1 < 1 >

Drop
Clear
Maintain >

Step 10 Select a check method as required.

You can check a table with any of the following methods: **Check**, **Quick**, **Fast**, **Changed**, and **Extended**.

Figure 3-43 Selecting a check method




Step 11 In the displayed dialog box, click **Yes**.

----End

Repairing a Table

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

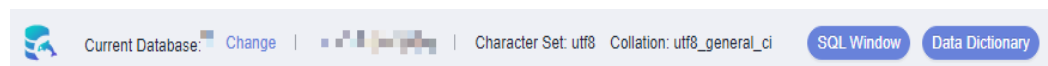
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to maintain a table.

Figure 3-44 Switching to another database



Step 8 On the displayed **Objects** tab, choose **Tables** on the left.

Step 9 Locate the table you want to repair and choose **More > Maintain > Repair** in the **Operation** column.

Figure 3-45 Repairing a table

	Table Name	Created	Rows(Estimated)	Table Size(Estimated)	Index Size(Estimated)	Character Set	Operation
+	test_tb	2023-07-13 10:55:06	1005003(Estimated)	88.56MB(Estimated)	0B(Estimated)	utf8mb4	Query SQL Statements Open View Alter Rename More▼

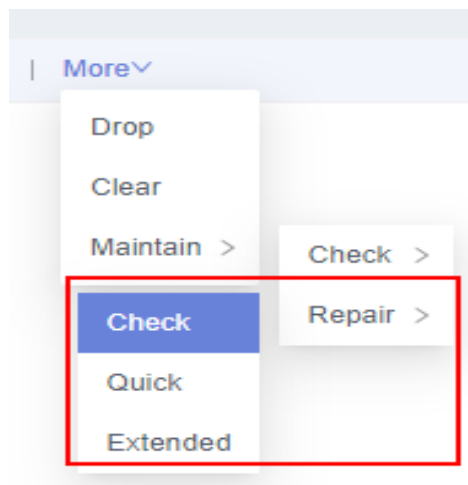
10 / page v Total Records: 1 < 1 >

- Drop
- Clear
- Maintain >

Step 10 Select a repair method as required.

You can repair tables using any of the following three methods: **Check**, **Quick**, and **Extended**.

Figure 3-46 Selecting a repair method



Step 11 In the displayed dialog box, click **Yes**.

----End

3.5 View Management


3.5.1 Creating a View

This section describes how to create a view on the DAS console.

Procedure

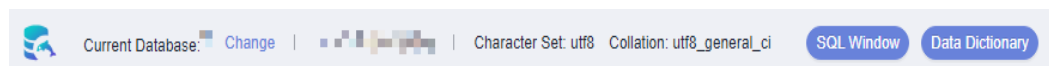
Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-47 Switching to another database



- Step 8** On the **Objects** tab page, choose **Views**.
- Step 9** In the upper left corner of the page, click **Create View**.
- Step 10** On the displayed page, configure basic information.

Figure 3-48 Configuring parameters

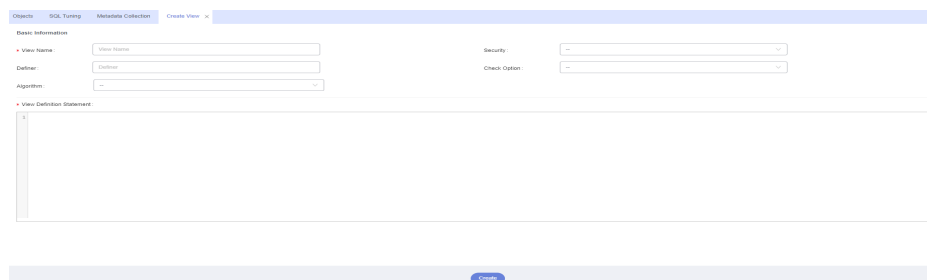


Table 3-8 Parameter description

Parameter	Description
View Name	(Mandatory) Enter a view name.
Definer	Enter a definer.
Algorithm	<p>(Optional) You can leave this parameter blank or set it to MERGE, TEMPTABLE, or UNDEFINED.</p> <ul style="list-style-type: none"> ● UNDEFINED: The required algorithm is automatically selected. ● MERGE: A combination algorithm. Executing this algorithm will combine and execute SQL statements of the view and those of the external query view. ● EMPTABLE: The result is stored in a temporary table for query.

Parameter	Description
Security	(Optional) You can leave this parameter blank or set it to DEFINER or INVOKER . <ul style="list-style-type: none">• DEFINER: When the view is executed, the user account specified by DEFINER will be used to check access privileges for the view.• INVOKER: When the view is executed, the user account specified by INVOKER will be used to check access privileges for the view.
Check Option	(Optional) You can leave this parameter blank or set it to LOCAL or CASCADED . <ul style="list-style-type: none">• If you select CASCADED for Check Option, the view that the current view depends on will also have the check option.• If you select LOCAL for Check Option, the system checks whether the view that the current view depends on has check options. If yes, the system checks the view that the current view depends on. If no, the system does not check the view.
View Definition Statement	Enter a SQL statement for creating the view. You only need to enter the SELECT part.

Step 11 Click **Create** at the bottom of the page.

Step 12 In the displayed dialog box, click **Execute**.

----End

3.5.2 Opening a View

This section describes how to view details of a view on the DAS console.


Usage Notes

Views do not have primary keys and their data can only be queried but not edited.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

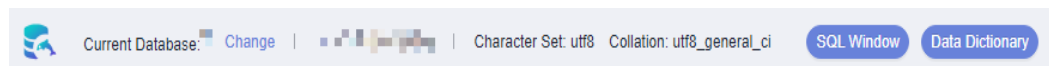
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

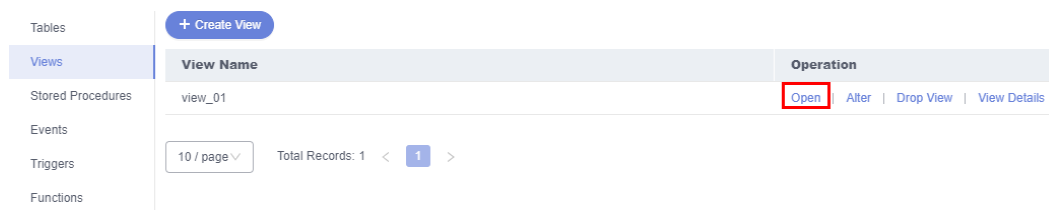
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-49 Switching to another database



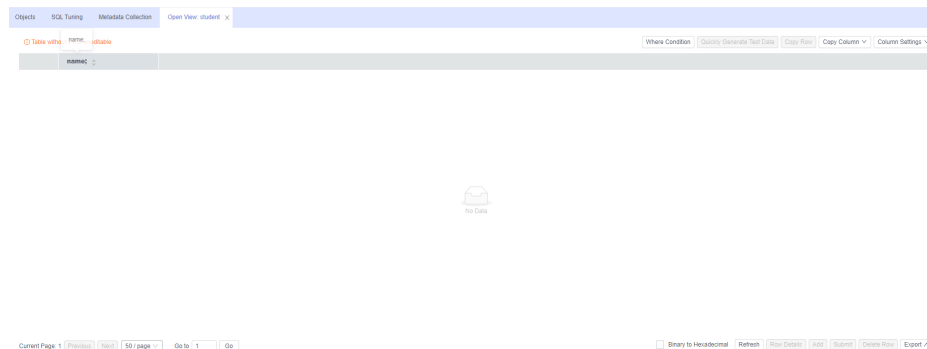
- Step 8** On the **Objects** tab page, choose **Views**.
- Step 9** Locate the view you want to open and click **Open** in the **Operation** column.

Figure 3-50 Opening a view



- Step 10** On the displayed page, check view details and query view information using a Where condition.

Figure 3-51 Viewing details of a view



You can also perform operations described in **Table 3-9** on the view.

Table 3-9 UI operations

Name	Description
Where Condition	Filters records.
Copy Row	Allows you to copy data of a selected row. Specifically, select the row you want to copy and click Copy Row .

Name	Description
Copy Column	Allows you to copy data of a selected column. Specifically, click Copy Column and select a column from the drop-down list.
Copy	Allows you to copy a piece of data. Specifically, hover the cursor on the data and click Copy .
Column Settings	Allows you to set the columns you want to display.
Convert binary to hexadecimal	Prevents binary data in columns from being displayed as garbled characters. If there is binary data in columns, you must select this option.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.
Add Row	Allows you to add rows.
Submit	Allows you to submit and save the changes to data.
Delete Row	Allows you to delete the selected rows.
Export	Exports a maximum of 10,000 data records to a CSV or SQL file.

----End



3.5.3 Altering a View

This section describes how to modify the definition, security, and algorithm of a view on the DAS console.

Usage Notes

Improper alterations on a view will cause instance or service exceptions.

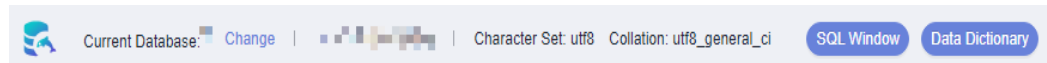
Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to create a table.

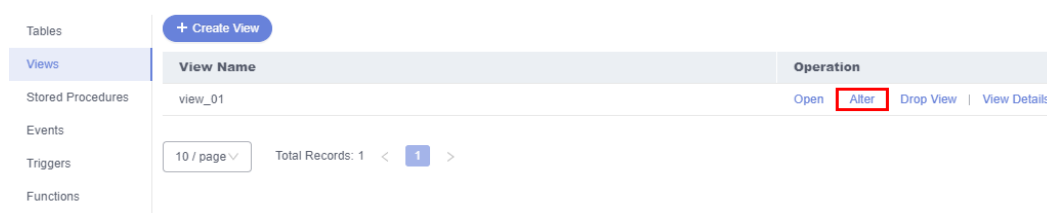
Figure 3-52 Switching to another database



Step 8 On the **Objects** tab page, choose **Views**.

Step 9 Locate the view you want to alter and click **Alter** in the **Operation** column.

Figure 3-53 Altering a view



Step 10 On the displayed page, modify information of the view, including the security, algorithm, and view definition statement.

Figure 3-54 Editing a view

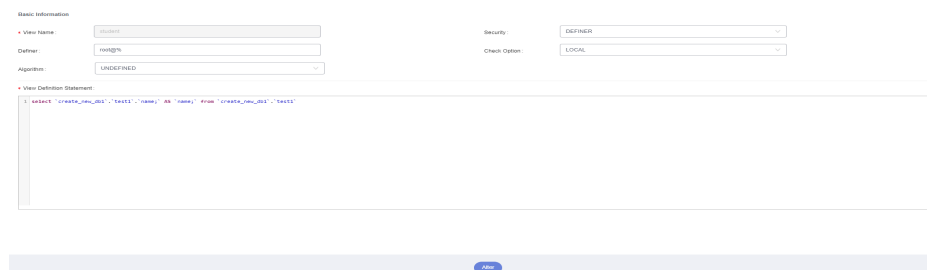


Table 3-10 Parameter description

Parameter	Description
Definer	Enter a definer.
Algorithm	<p>(Optional) You can leave this parameter blank or set it to MERGE, TEMPTABLE, or UNDEFINED.</p> <ul style="list-style-type: none"> UNDEFINED: The required algorithm is automatically selected. MERGE: A combination algorithm. Executing this algorithm will combine and execute SQL statements of the view and those of the external query view. EMPTABLE: The result is stored in a temporary table for query.

Parameter	Description
Security	(Optional) You can leave this parameter blank or set it to DEFINER or INVOKER . <ul style="list-style-type: none">• DEFINER: When the view is executed, the user account specified by DEFINER will be used to check access privileges for the view.• INVOKER: When the view is executed, the user account specified by INVOKER will be used to check access privileges for the view.
Check Option	(Optional) You can leave this parameter blank or set it to LOCAL or CASCADED . <ul style="list-style-type: none">• If you select CASCADED for Check Option, the view that the current view depends on will also have the check option.• If you select LOCAL for Check Option, the system checks whether the view that the current view depends on has check options. If yes, the system checks the view that the current view depends on. If no, the system does not check the view.
View Definition Statement	Enter a SQL statement for creating the view. You only need to enter the SELECT part.

Step 11 Click **Alter** at the bottom of the page.

Step 12 In the displayed dialog box, click **Execute**.

----End

3.5.4 Dropping a View

This section describes how to drop a view that is no longer needed.


Usage Notes

Dropped views cannot be recovered. Exercise caution when performing this operation.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

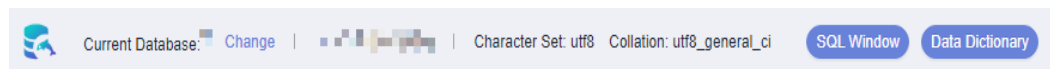
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

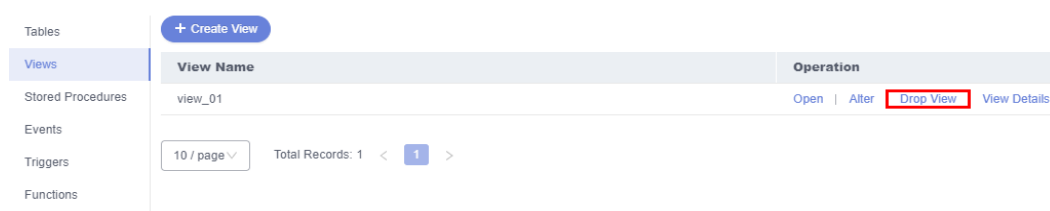
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-55 Switching to another database



- Step 8** On the **Objects** tab page, choose **Views**.
- Step 9** Locate the view you want to drop and click **Drop View** in the **Operation** column.

Figure 3-56 Dropping a view



- Step 10** In the displayed dialog box, click **Yes**.
- End

3.5.5 Viewing Details of a View

This section describes how to view details of a view, which show the SQL statement for creating it.

Procedure



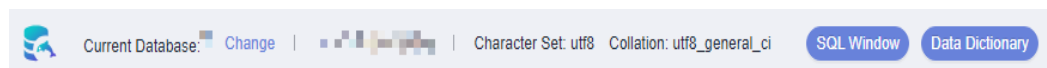
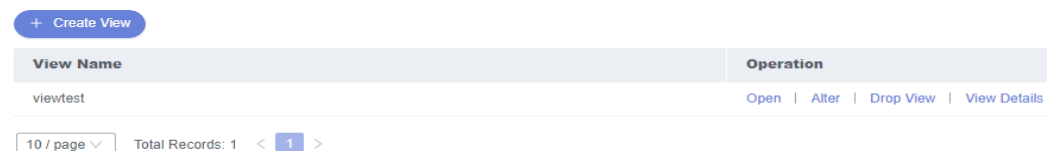
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-57 Switching to another database

Step 8 On the **Objects** tab page, choose **Views**.

Step 9 Locate the view whose details you want to view and click **View Details** in the **Operation** column.

Figure 3-58 Viewing details of a view

Step 10 In the displayed dialog box, view the SQL statement for creating the view.

----End

3.6 Stored Procedure Management

3.6.1 Creating a Stored Procedure

A stored procedure is a set of SQL statements used to implement specific functions. After being compiled, stored procedures are stored in databases. You can execute the stored procedures by specifying their names and related parameters.

A stored procedure consists of a set of SQL statements that can complete specific tasks or process complex services. This section describes how to create a stored procedure. You can use loop statements in a stored procedure to insert objects repeatedly.


Prerequisites

- You have obtained the CREATE ROUTINE permission.
- You have obtained the EXECUTE permission.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

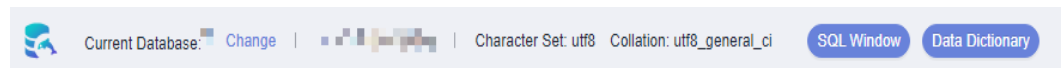
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

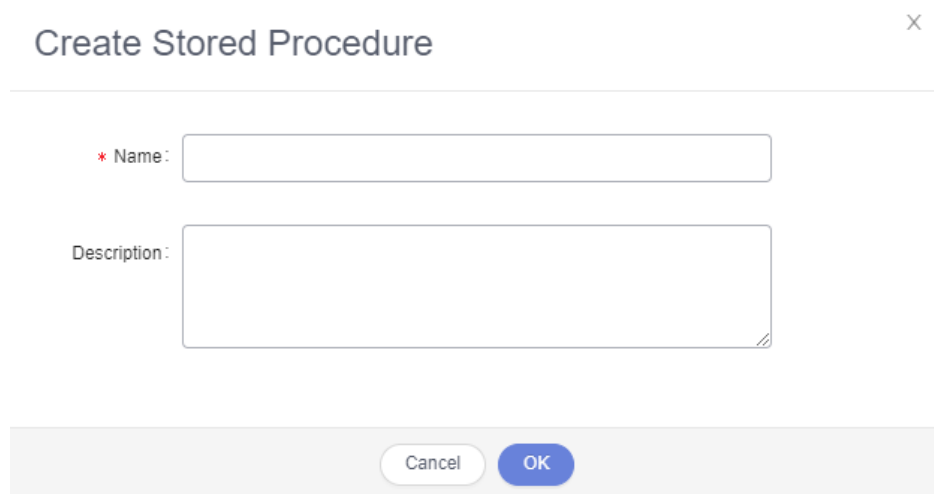
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-59 Switching to another database

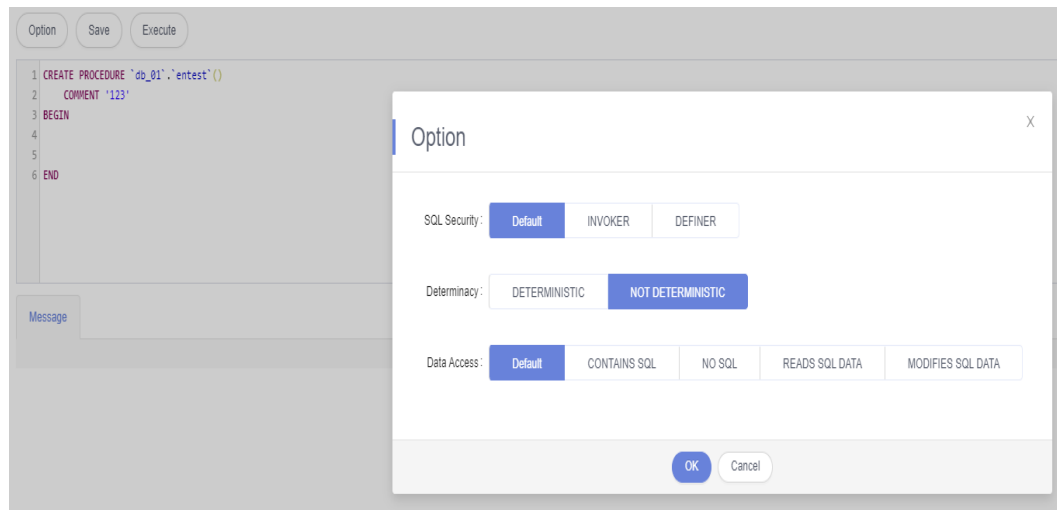


- Step 8** On the **Objects** tab page, choose **Stored Procedures**.
- Step 9** Click **Create Stored Procedure**.
- Step 10** In the displayed dialog box, enter a stored procedure name and description.

Figure 3-60 Specifying stored procedure information



- Step 11** Click **OK**.
- Step 12** Click **Option** in the upper left corner. In the displayed dialog box, set option parameters based on service requirements.

Figure 3-61 Setting parameters

Step 13 After setting the option parameters, save or execute the stored procedure.

Step 14 View the execution status in the **Message** area.

----End

3.6.2 Altering or Executing a Stored Procedure

This section describes how to alter or execute a stored procedure on the DAS console.


Usage Notes

Improper alterations on a stored procedure will cause instance or service exceptions.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

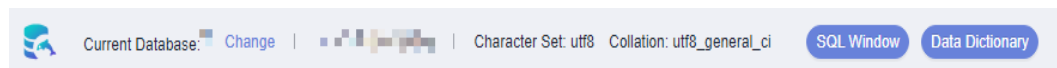
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to create a table.

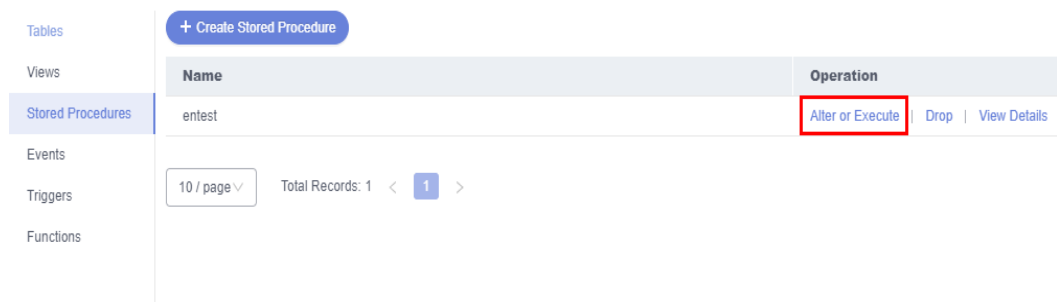
Figure 3-62 Switching to another database



Step 8 On the **Objects** tab page, choose **Stored Procedures**.

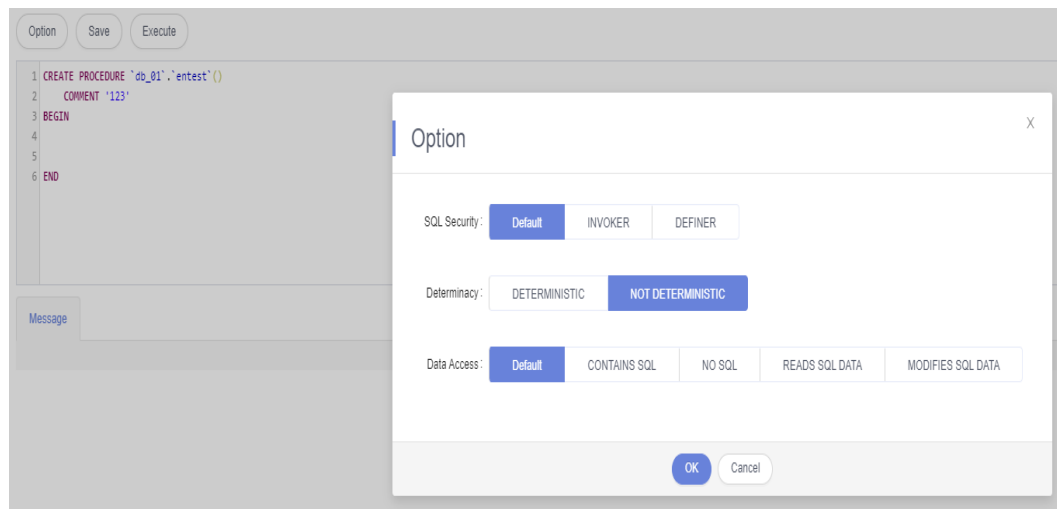
Step 9 Locate the stored procedure you want to alter or execute and click **Alter or Execute** in the **Operation** column.

Figure 3-63 Altering or executing a stored procedure



Step 10 On the displayed page, click **Option** to set parameters and click **OK**. Then, click **Save**.

Figure 3-64 Page for altering a stored procedure



Step 11 Execute the stored procedure and view the execution status in the **Message** area.

----End

3.6.3 Dropping a Stored Procedure

This section describes how to drop a stored procedure that is no longer needed.

Usage Notes

Dropped stored procedures cannot be recovered. Exercise caution when performing this operation.

Procedure



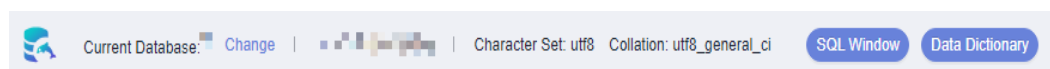
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-65 Switching to another database



- Step 8** On the **Objects** tab page, choose **Stored Procedures**.
- Step 9** Locate the stored procedure you want to drop and click **Drop** in the **Operation** column.

Figure 3-66 Dropping a stored procedure



- Step 10** In the displayed dialog box, click **Yes**.

----End

3.6.4 Viewing Details of a Stored Procedure

This section describes how to view details of a stored procedure on the DAS console. The details show the SQL statement for creating this stored procedure.

Procedure



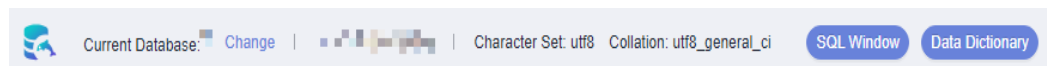
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-67 Switching to another database



- Step 8** On the **Objects** tab page, choose **Stored Procedures**.
- Step 9** Locate the stored procedure whose details you want to view and click **View Details** in the **Operation** column.
- Step 10** In the displayed dialog box, view the SQL statement for creating the stored procedure.
----End

3.7 Event Management


3.7.1 Creating an Event

This section describes how to create an event to periodically respond to specific operations.

If you set **event_scheduler** to **ON** and enable the event function, you can manage events.

When **event_scheduler** is set to **OFF**, but the event function is enabled, you can only create events and the events do not take effect.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.


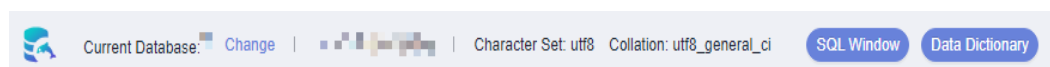
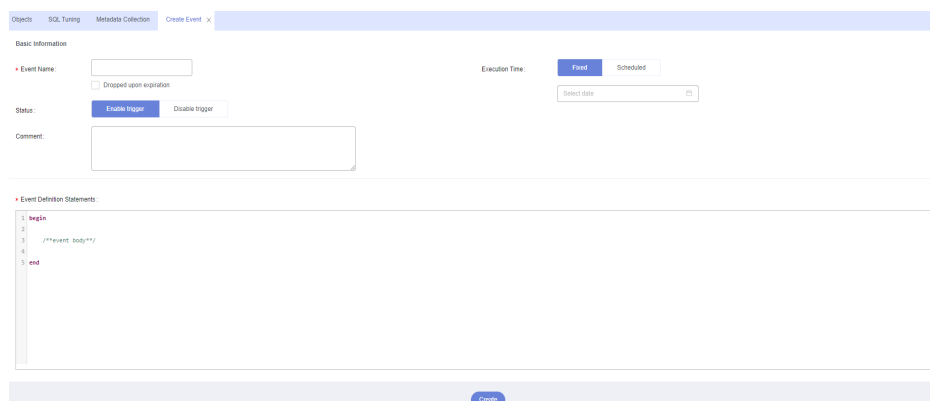
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-68 Switching to another database



- Step 8** On the **Objects** tab page, choose **Events**.
- Step 9** Click **Create Event**.
- Step 10** Enter an event name (mandatory) and event definition statements (mandatory), set the execution time, status, and comment, and click **Create**.

Figure 3-69 Event details



- **Event Definition Statements**

Indicates the SQL statements to be executed when a scheduled event is triggered.

- **Dropped upon expiration**

- Indicates that the events to be executed at a fixed point in time will be deleted after they are executed.
- Indicates that the events to be periodically executed will be deleted at the specified end time.

- Step 11** In the displayed dialog box, click **Execute**.

If there are no errors reported, the event takes effect.

----End

3.7.2 Altering an Event

This section describes how to alter an event.

Usage Notes

Improper alterations on an event will cause instance or service exceptions.

Procedure



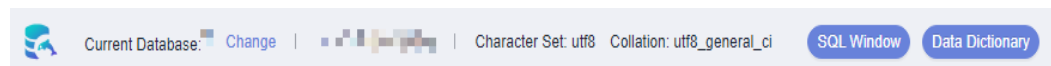
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-70 Switching to another database



- Step 8** On the **Objects** tab page, choose **Events**.
- Step 9** Locate the event you want to alter and click **Alter** in the **Operation** column.

Figure 3-71 Altering an event



- Step 10** On the displayed page, modify the required information and click **Alter**.

Figure 3-72 Page for altering event information

Basic Information

Event Name: Execution Time: Fixed Scheduled

Dropped upon expiration

Status: Enable trigger Disable trigger

Comment:

2020-09-08 15:19:00

Event Definition Statements:

```
1 begin
2
3 /*event body*/
4
5 end
```

Add

Step 11 In the displayed dialog box, click **Execute**.

----End

3.7.3 Dropping an Event

This section describes how to drop an event that is no longer needed.


Usage Notes

Dropped events cannot be recovered. Exercise caution when performing this operation.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

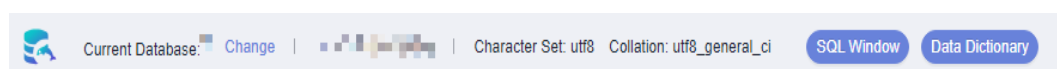
Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

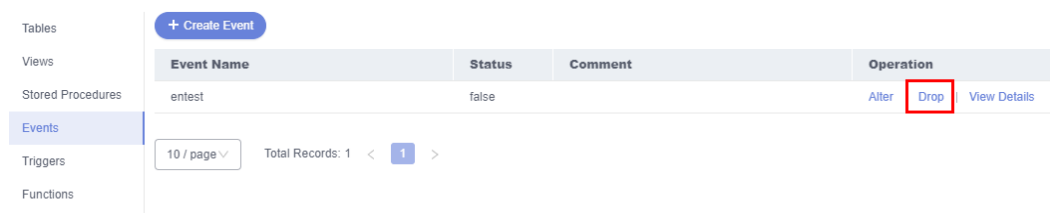
Step 7 Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-73 Switching to another database

Step 8 On the **Objects** tab page, choose **Events**.

Step 9 Locate the event you want to drop and click **Drop** in the **Operation** column.

Figure 3-74 Dropping an event



Event Name	Status	Comment	Operation
entest	false		Alter Drop View Details

Step 10 In the displayed dialog box, click **Yes**.

----End


3.7.4 Viewing Details of an Event

This section describes how to view details of an event on the DAS console. The details show the SQL statement for creating the event.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

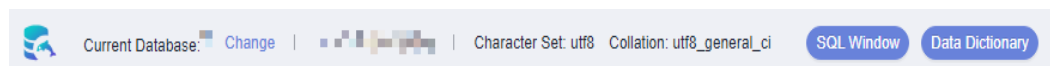
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-75 Switching to another database



Step 8 On the **Objects** tab page, choose **Events**.

Step 9 Locate the event whose details you want to view and click **View Details** in the **Operation** column.

Figure 3-76 Viewing details of an event



Event Name	Status	Comment	Operation
event001	false		Alter Drop View Details

Step 10 In the displayed dialog box, view the SQL statement for creating the event.

----End

3.8 Trigger Management

3.8.1 Creating a Trigger

This section describes how to create a trigger on the DAS console. A trigger is a set of SQL statements stored in the database catalog. Whenever an event associated with a table occurs, a SQL trigger is executed or fired to insert, update, or delete data.

Procedure



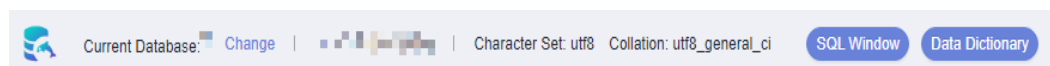
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-77 Switching to another database



- Step 8** On the **Objects** tab page, choose **Triggers**.
- Step 9** Click **Create Trigger**.
- Step 10** On the displayed page, set required parameters and edit trigger definition statements. Then, click **Create**.

Figure 3-78 Specifying trigger information

Basic Information

* Trigger Name:	<input type="text"/>	* Trigger Table:	<input type="text"/>
* Trigger Condition:	<input type="text"/>	* Trigger Event:	<input type="text"/>

* Trigger Definition Statement:

```
1 begin
2
3   /**trigger body**/
4
5 end
```

Step 11 In the displayed dialog box, click **Execute**.

----End

3.8.2 Altering a Trigger


This section describes how to alter the name, table, condition, and event of a trigger as well as the SQL statement for defining the trigger on the DAS console.


Usage Notes

Improper alterations on a trigger will cause instance or service exceptions.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

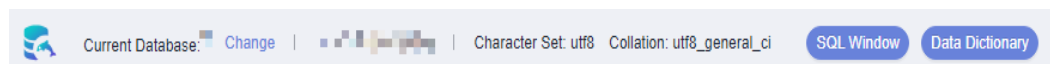
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to create a table.

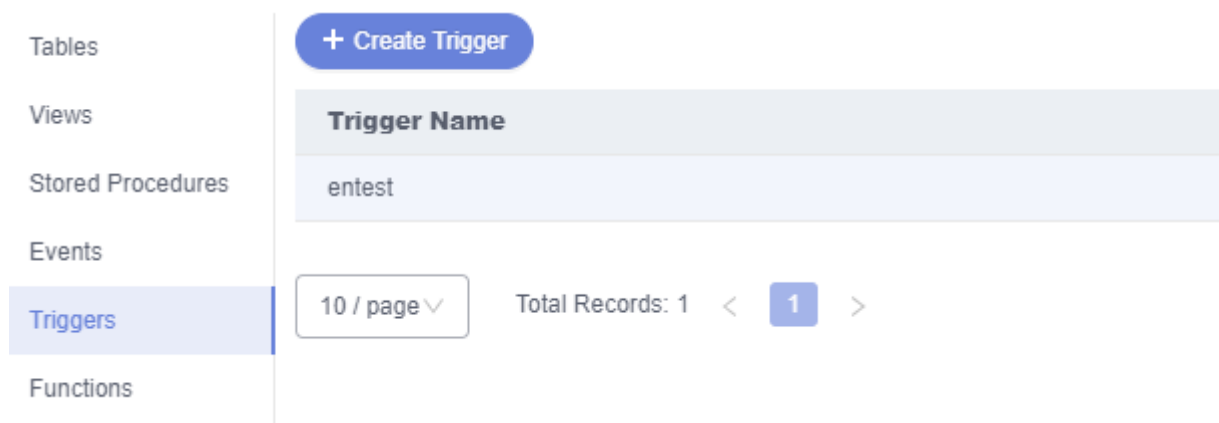
Figure 3-79 Switching to another database



Step 8 On the **Objects** tab page, choose **Triggers**.

Step 9 Locate the trigger you want to alter and click **Alter** in the **Operation** column.

Figure 3-80 Altering a trigger



Step 10 On the displayed page, modify the required parameters and click **Alter**.

Figure 3-81 Editing parameters

Basic Information

* Trigger Name:

* Trigger Table:

* Trigger Condition:

* Trigger Event:

* Trigger Definition Statement:

```
1 begin
2
3 /**trigger body**/
4
5 end
```

Step 11 In the displayed dialog box, click **Execute**.

----End

3.8.3 Dropping a Trigger

This section describes how to drop a trigger that is no longer needed.

Usage Notes

Dropped triggers cannot be recovered. Exercise caution when performing this operation.

Procedure



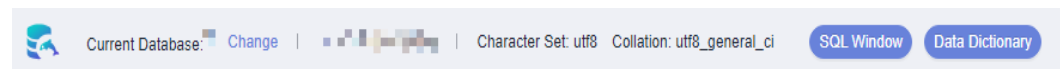
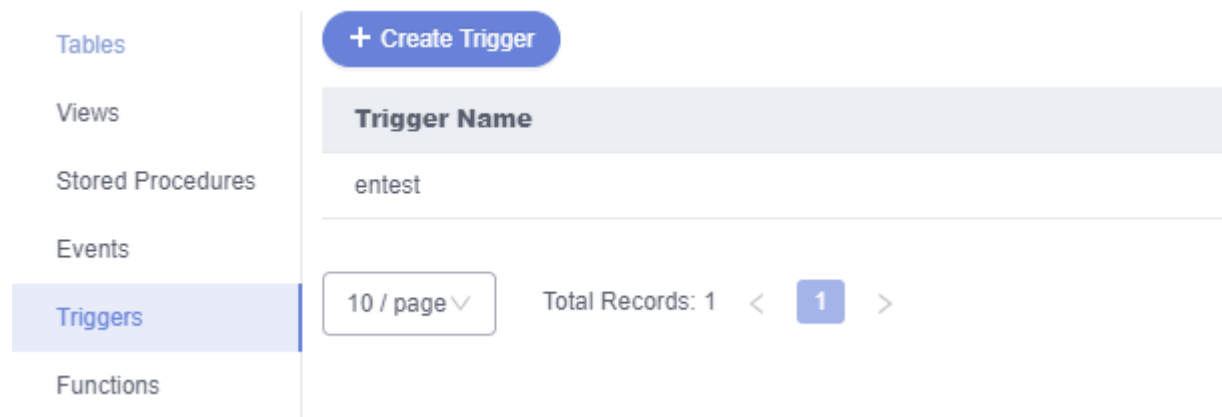
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-82 Switching to another database

Step 8 On the **Objects** tab page, choose **Triggers**.

Step 9 Locate the trigger you want to drop and click **Drop Trigger** in the **Operation** column.

Figure 3-83 Dropping a trigger

Step 10 In the displayed dialog box, click **Yes**.

----End


3.8.4 Viewing Details of a Trigger

This section describes how to view details of a trigger on the DAS console. The details show the SQL content for creating the trigger.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

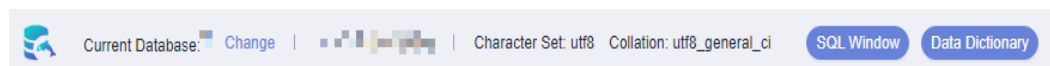
Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

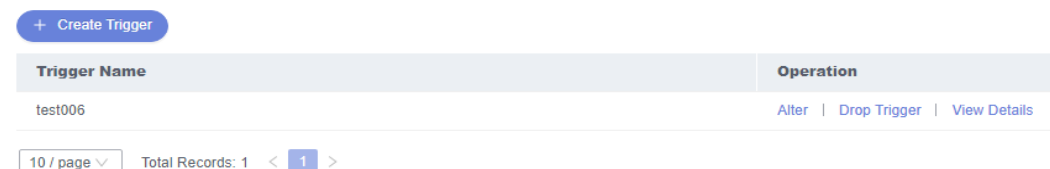
Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-84 Switching to another database

Step 8 On the **Objects** tab page, choose **Triggers**.

Step 9 Locate the trigger whose details you want to view and click **View Details** in the **Operation** column.

Figure 3-85 Viewing details of a trigger

Step 10 In the displayed dialog box, view the SQL statement for creating the trigger.

----End

3.9 Function Management


3.9.1 Creating a Function

Functions can improve modularity of applications and code reusability. This section describes how to create a function on the DAS console.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

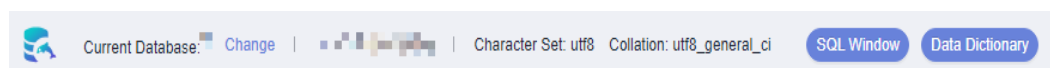
Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-86 Switching to another database

- Step 8** On the **Objects** tab page, choose **Functions**.
- Step 9** In the upper left corner of the page, click **Create Function**.
- Step 10** In the displayed dialog box, enter a function name, returned value type, and description, and click **OK**.

Figure 3-87 Page for creating a function

The screenshot shows a 'Create Function' dialog box. It has a title bar with a close button (X). The form contains three fields: 'Function Name' (required, empty), 'Returned Value' (required, containing 'tinyint'), and 'Description' (empty). At the bottom are 'OK' and 'Cancel' buttons.

- Step 11** On the displayed page, edit the function body.

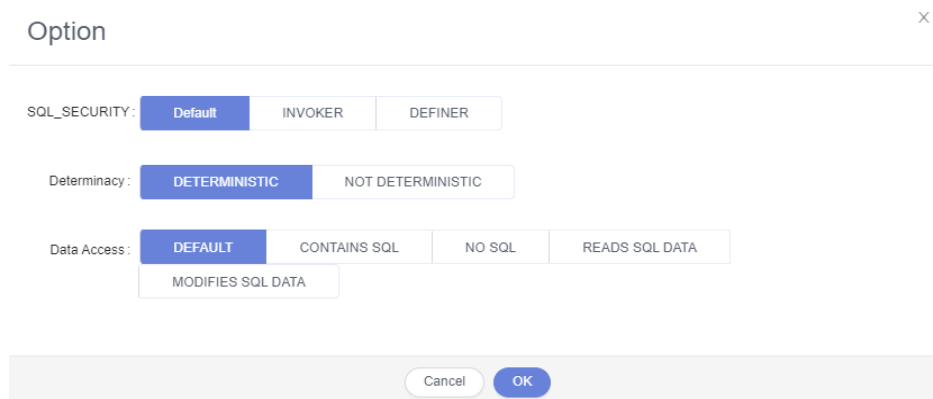
Figure 3-88 Editing a function body

The screenshot shows a function body editor. It has a title bar with 'Option', 'Save', and 'Execute' buttons. The code editor contains the following SQL code:

```
1 CREATE FUNCTION `create_new_db1`.`133`()  
2 RETURNS tinyint  
3 BEGIN  
4  
5 RETURN <value>;  
6 END
```

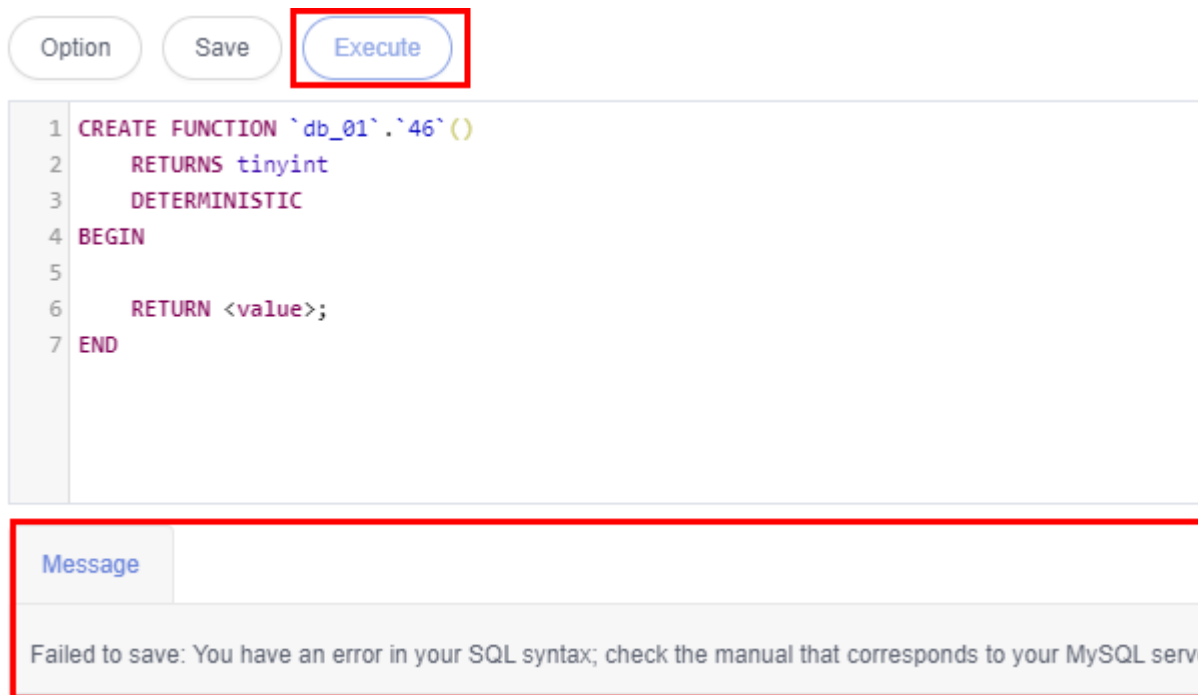
- Step 12** In the upper left corner, click **Option**. In the displayed dialog box, set required parameters and click **OK**.

Figure 3-89 Setting required parameters



Step 13 Click **Execute**.

Figure 3-90 Executing a function



Step 14 After the function is successfully executed, view the execution status in the **Message** area.

----End

3.9.2 Altering or Executing a Function

This section describes how to alter or execute a function on the DAS console.

Usage Notes

Improper alterations on a function will cause instance or service exceptions.

Procedure



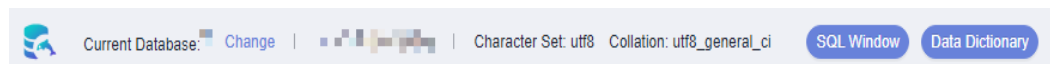
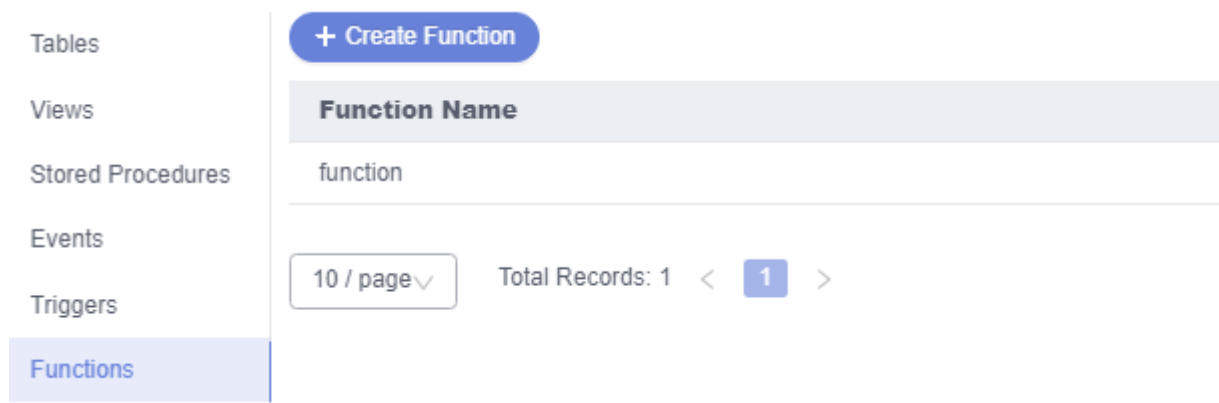
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-91 Switching to another database

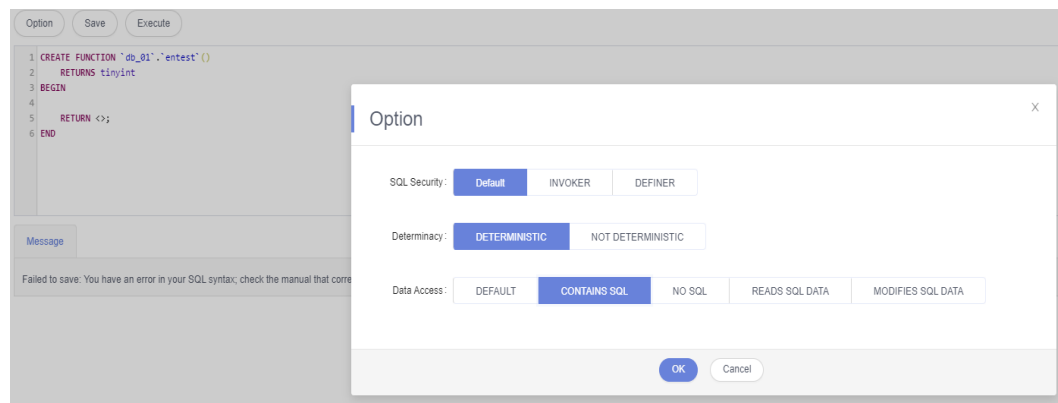


- Step 8** On the **Objects** tab page, choose **Functions**.
- Step 9** Locate the function you want to alter or execute and click **Alter or Execute** in the **Operation** column.

Figure 3-92 Altering or executing a function



- Step 10** On the displayed page, alter the content as required.

Figure 3-93 Altering a function

Step 11 After the alteration is complete, click **Execute**.

----End

3.9.3 Dropping a Function

This section describes how to drop a function that is no longer needed.

Usage Notes

Dropped functions cannot be recovered. Exercise caution when performing this operation.

Procedure



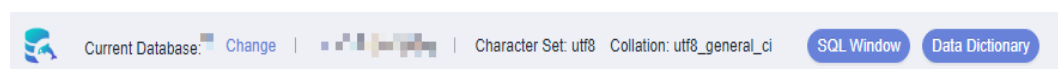
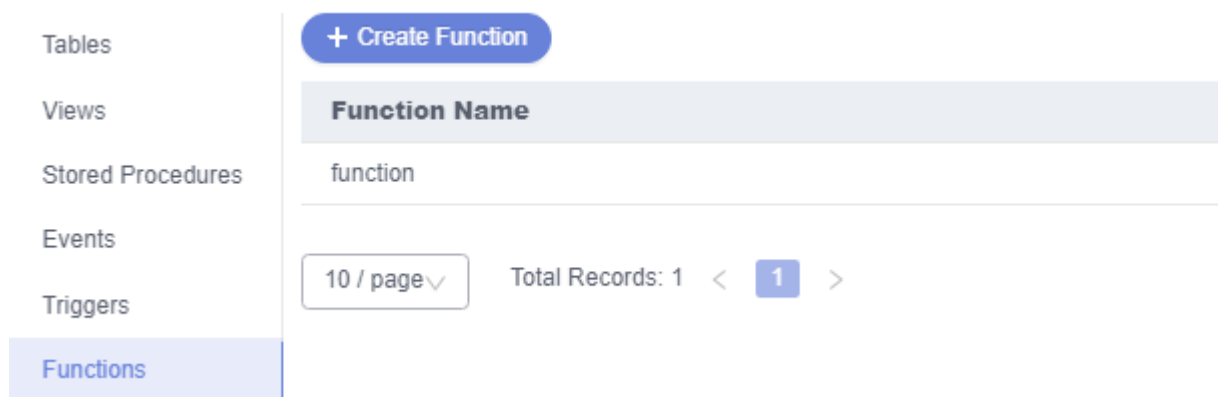
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-94 Switching to another database

- Step 8** On the **Objects** tab page, choose **Functions**.

Step 9 Locate the function you want and click **Drop Function** in the **Operation** column.

Figure 3-95 Dropping a function



Step 10 In the displayed dialog box, click **Yes**.

----End


3.9.4 Viewing Details of a Function

This section describes how to view details of a function on the DAS console. The details show the SQL statement for creating the function.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

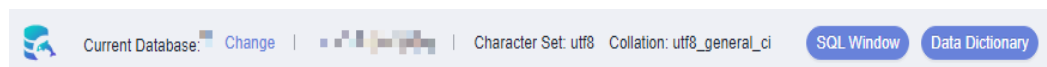
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

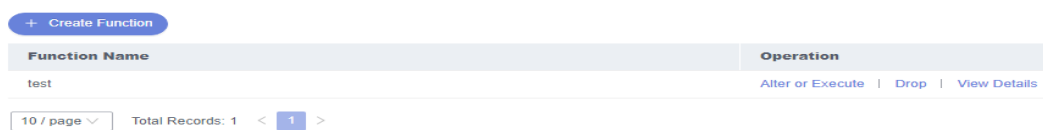
Step 7 Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 3-96 Switching to another database



Step 8 On the **Objects** tab page, choose **Functions**.

Step 9 Locate the function you want and click **View Details** in the **Operation** column.

Figure 3-97 Viewing details of a function

The screenshot shows a table with two columns: 'Function Name' and 'Operation'. The 'Function Name' column contains the value 'test'. The 'Operation' column contains the text 'Alter or Execute | Drop | View Details'. Above the table, there is a '+ Create Function' button. Below the table, there is a pagination control showing '10 / page' and 'Total Records: 1' with a page number '1' in a blue box.

Function Name	Operation
test	Alter or Execute Drop View Details

Step 10 In the displayed dialog box, view function details and click **Close**.

----End

3.10 Data Import and Export

3.10.1 Importing Data

This section describes how to import data from your local PC or an OBS bucket for data backup and migration.


Usage Notes

- Import data into a table for backup or migration. If you import a CSV or SQL file, the file must have the same data type as the target table.
- Only one file that is no larger than 1 GB can be imported at a time.
- Only data files in the CSV or SQL format can be imported. If the number of MySQL 8.0 instance tables exceeds 100,000 (more than 10,000 in MySQL 5.7 and 5.6), the CSV format cannot be used.
- Binary fields such as BINARY, VARBINARY, TINYBLOB, BLOB, MEDIUMBLOB, and LONGBLOB are not supported.
- The size of a single SQL statement to be imported must be less than 100 MB.
- If a SQL file containing binary data is exported using the mysqldump tool, the file cannot be imported.
- Only OBS buckets of the current IAM account can be imported.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Import**.

Step 7 Click **Create Task**.

Figure 3-98 Creating an import task

Create Task
×

Import Type

sql

CSV

File Source

Upload file

Choose from OBS

Attachment Storage ?

5257

▼

Bucket ACL Info

No OBS bucket? [Create OBS Bucket](#)

Creating an OBS bucket is free of charge, but storing files in it will incur fees.

Attachment

+

Click here to upload a file, or drag one here. (.sql)

Upload only one attachment that is no larger than 1 GB.

Database

prd

Charset

UTF8

GBK

Auto Detect

Options

Ignore errors, that is, skip the step where the SQL statement fails to be executed.

Delete the uploaded file upon an import success.

Remarks

Create

Cancel

Table 3-11 Parameter description

Parameter	Description
Import Type	Set Import Type to sql or CSV .

Parameter	Description
File Source	<p>Import a file from your local PC or an OBS bucket.</p> <ul style="list-style-type: none"> Upload file If you select Upload file for File Source, you need to set Attachment Storage and upload the required file. To keep your data secure, provide your own OBS bucket to store the file you uploaded. In this way, DAS automatically connects to your OBS bucket for in-memory reading. No data is stored on DAS. Creating OBS buckets is free of charge, but saving files will incur certain costs. If you select Delete the uploaded file upon an import success, the file you uploaded will be automatically deleted from the OBS bucket after being imported to the destination database. Choose from OBS If you select Choose from OBS for File Source, you need to select a file from the bucket. The file uploaded from an OBS bucket will not be deleted upon an import success.
Attachment Storage	<p>Select an OBS bucket to store the file. Click Bucket ACL Info to check whether a public OBS bucket is selected.</p> <ul style="list-style-type: none"> SAFE: The bucket ACL permission set does not contain ALL USERS. WARN: The bucket ACL permission set contains ALL USERS. UNKNOWN: The bucket ACL permission set is unknown, maybe due to the lack of IAM permissions. You are advised to go to the OBS page to view the bucket ACL configuration.
Database	Select the database that you want to import the file to.
Charset	Select a charset as needed.
Options	<p>If you select Ignore errors, that is, skip the step where the SQL statement fails to be executed, the system will skip any errors detected when SQL statements are being executed.</p> <p>If you select Delete the uploaded file upon an import success, the file you uploaded will be automatically deleted from the OBS bucket after being imported to the destination database. This option is only available to the files uploaded from your local PC.</p>
Remarks	Enter remarks as required.

Step 8 After setting import parameters, click **Create**.

Confirm the information again before you click **OK** because original data may be overwritten after data import.

Step 9 On the displayed page, view import progress in the task list.

Click **Details** in the **Operation** column to view task details.

----End

3.10.2 Exporting Data

DAS allows you to export a large amount of data at a time to facilitate data query or to back up data for migration. This section describes how to export data.

DAS allows you to export an entire database, some data tables, or result sets of SQL statements.

Usage Notes

- If you do not select **Generate a file for each table** when exporting data, the exported data file is in **.zip** format. Data files in this format cannot be directly imported. You need to decompress the file before importing it again.
- If **Generate a file for each table** is selected during data export, the exported data file is in **.sql** or **.csv** format. In this case, the exported data file can be directly imported again.
- If the **Exporting a Database** function is used to export over 100,000 MySQL 8.0 instance tables (more than 10,000 in MySQL 5.7 and 5.6), an error message will be displayed indicating that the number of tables is too large and data cannot be exported. In this case, use the **Exporting SQL Results** function instead.
- Only OBS buckets of the current IAM account can be exported.


Prerequisites

You have created a user database on the DAS console. For details, see [Creating a Database](#).

Exporting a Database

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

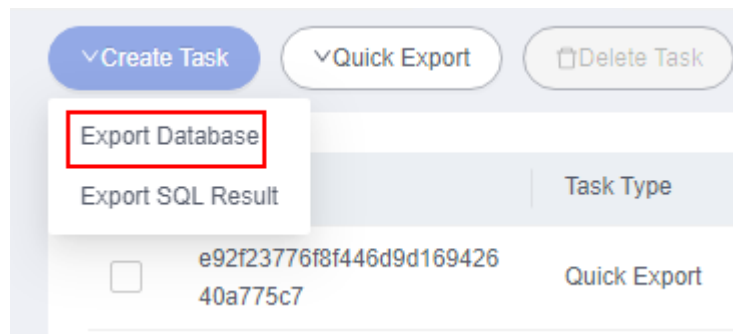
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

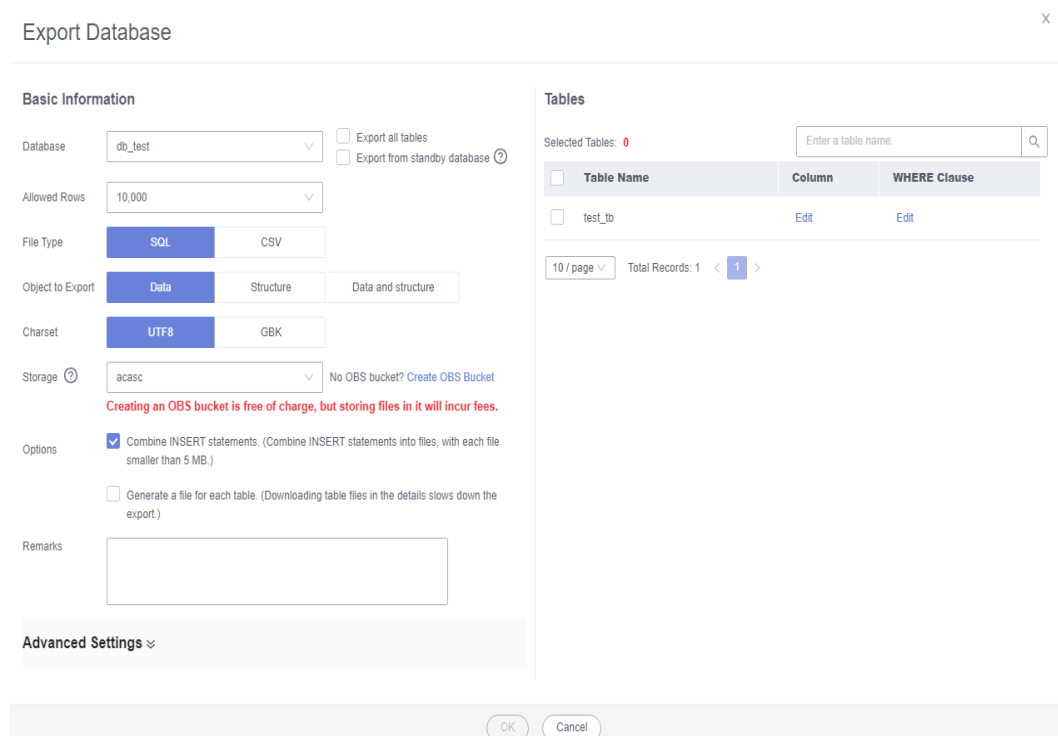
Step 7 In the upper left corner of the page, click **Create Task** and choose **Export Database**.

Figure 3-99 Creating a task for exporting a database



Step 8 In the displayed dialog box, configure basic information and advanced settings as required.

Figure 3-100 Creating a task for exporting a database



- If you select **Export all tables**, data in an entire database or in specific tables will be exported.
- Databases are classified into user databases and system databases. System database cannot be exported. If system database data is required, deploy system database services in a user database, so that you can export the system database data from the user database.
- DAS connects to your standby database to export data. This prevents the primary database from being affected by data export. However, if the standby database has a high replication delay, the exported data may not be the latest.
- DAS does not store any user data. The exported data files are stored in the OBS bucket that you have created. You can specify the storage path. You can

click **Bucket ACL Info** in the **Create Task** dialog box to check whether a public OBS bucket is selected.

- Creating OBS buckets is free of charge, but saving files will incur certain costs.

Step 9 After settings are complete, click **OK**.

Step 10 In the task list, locate the created task and view the task ID, type, status, and progress.

Step 11 Click **Details** in the **Operation** column to view task details.

Figure 3-101 Task list


Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
4c341463a2146b7b20584c430200140	Database	db_test	2023-07-14 10:42:10	2023-07-14 10:42:11	260.89 KB	SQL	Successful	1 second	10000	100%		Details Download
e9202377804460916942640a775c7	Quick Export	db_test	2023-07-14 10:39:20	2023-07-14 10:39:21	1.61 MB	SQL	Successful	1 second	100000	100%		Details Download

----End

Exporting SQL Results

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

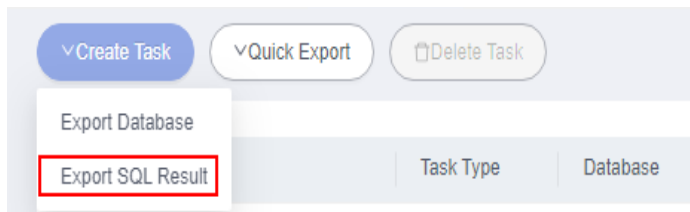
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

Step 7 In the upper left corner of the page, click **Create Task** and choose **Export SQL Result**.

Figure 3-102 Creating a task for exporting SQL results



Step 8 In the displayed dialog box, configure basic information and advanced settings as required.

Figure 3-103 Creating a task for exporting SQL results

Export SQL Result X

Basic Information

Database: Export from standby database ?

Allowed Rows:

File Type:

Charset:

Storage ?: No OBS bucket? [Create Bucket](#)

Creating an OBS bucket is free of charge, but storing files in it will incur fees.

Options

Combine INSERT statements. (Combine INSERT statements into files, with each file smaller than 5 MB.)

Generate one file for each result.

SQL to Execute:

Remarks:

Advanced Settings ∨

- In a SQL result export task, the executed SQL statements cannot exceed 5 MB.
- To export multiple SQL result sets at a time, enter SQL statements in the SQL text box. Enter each SQL statement on a separate line and add a semicolon (;) at the end. After the export task is complete, SQL files are generated. One SQL statement corresponds to one file.
- DAS does not store any user data. The exported data files are stored in the OBS bucket that you have created.
- You can click **Bucket ACL Info** in the **Create Task** dialog box to check whether a public OBS bucket is selected.
- Creating OBS buckets is free of charge, but saving files will incur certain costs.

Step 9 After settings are complete, click **OK**.

Step 10 In the task list, locate the created task and view the task ID, type, status, and progress.

Step 11 Click **Details** in the **Operation** column to view task details.

Figure 3-104 Task list

Task ID	Task Type	Database	Start	End	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
<input type="checkbox"/> 0C02770208440340551107	SQL Result	db_test	2023-07-14 10:4	2023-07-14 10:4	200.84 KB	SQL Result	Successful	1 second	10000	100%		Details Download
<input type="checkbox"/> 4C02770208440340551108	Database	db_test	2023-07-14 10:4	2023-07-14 10:4	200.89 KB	SQL	Successful	1 second	10000	100%		Details Download
<input type="checkbox"/> 0C02770208440340551109	Quick Export	db_test	2023-07-14 10:3	2023-07-14 10:3	1.41 MB	SQL	Successful	1 second	100000	100%		Details Download

----End


Downloading Data Files


Data exported using the data export function is stored in the OBS bucket you created. You can download exported data files in any of the following ways:

- Download on the DAS Console.
- Download on the OBS management console.

Quick Export (Not Promoted)

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

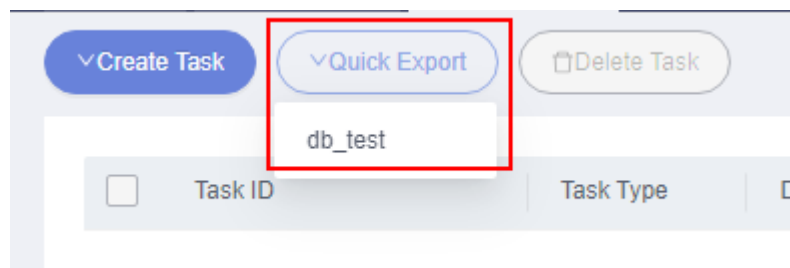
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

Step 7 In the upper left corner of the page, click **Quick Export** and select the database that you want to export data from.

Figure 3-105 Quick export

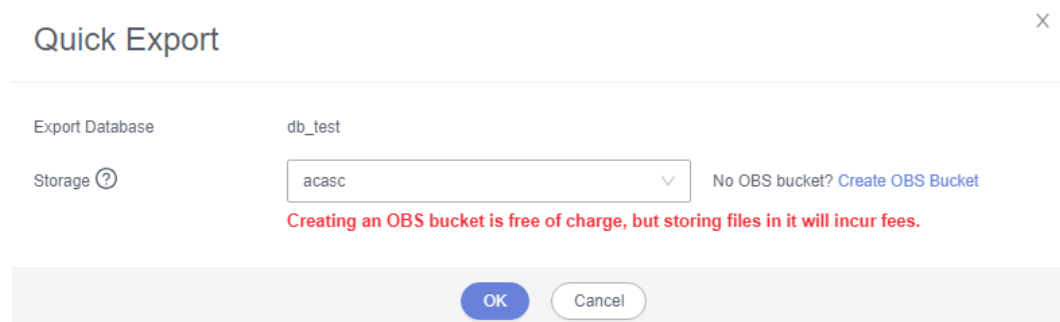


NOTE

A maximum of 200,000 rows can be quickly exported from a single table. To export more data, choose **Create Task > Export Database**.

Step 8 On the **Quick Export** page, select a storage path and click **OK**.

Figure 3-106 Quick export



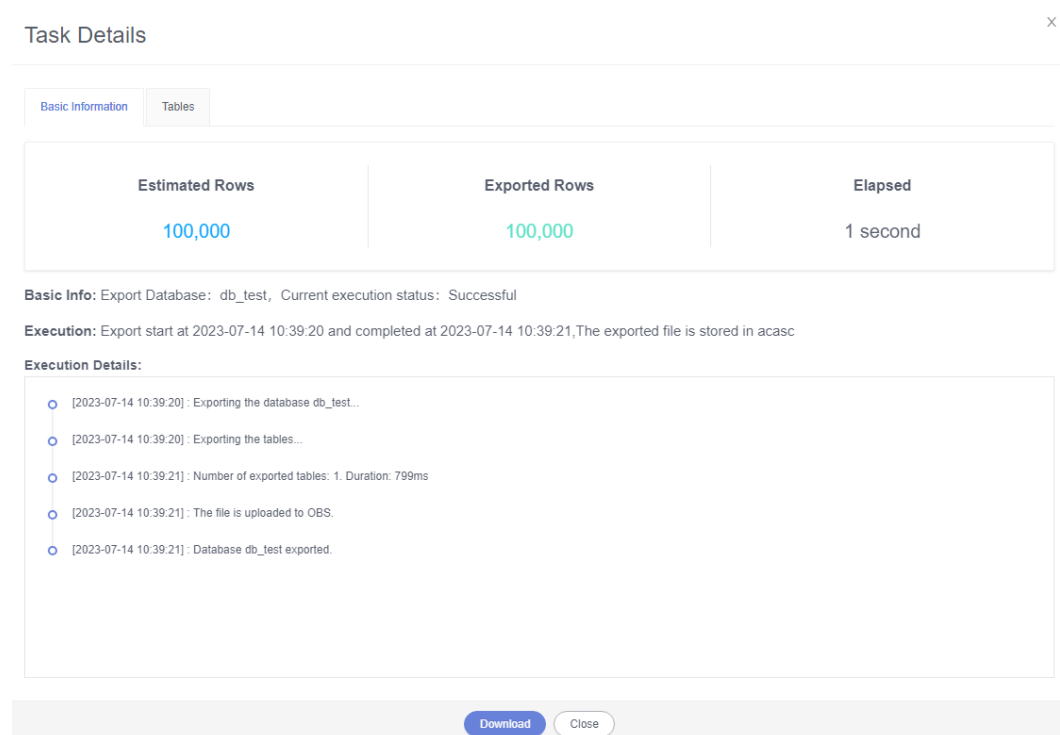
Step 9 In the task list, view the export task you created.

Figure 3-107 Task list

Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
e9223770844699169426 4ba175c7	Quick Export	db_test	2023-07-14 10:3 9:20	2023-07-14 10:3 9:21	1.61 MB	SQL	Successful	1 second	100000	100%		Details Download

In the row that contains the export task, you can click **Details** in the **Operation** column to view execution details of the task and information about exported tables.

Figure 3-108 Task details



-----End


3.11 Data Generator (Not Promoted)


During the functional testing of a program, a large amount of test data complying with specific rules needs to be inserted into the database. DAS can help you

generate test data based on specific rules. This section describes how to generate test data on the DAS console.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

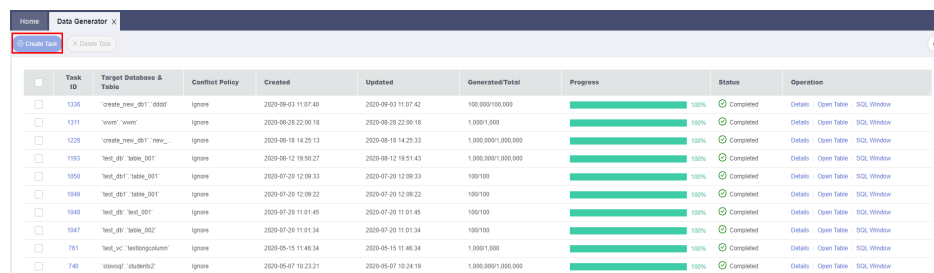
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Data Scheme > Data Generator**.

Step 7 On the displayed page, click **Create Task**.

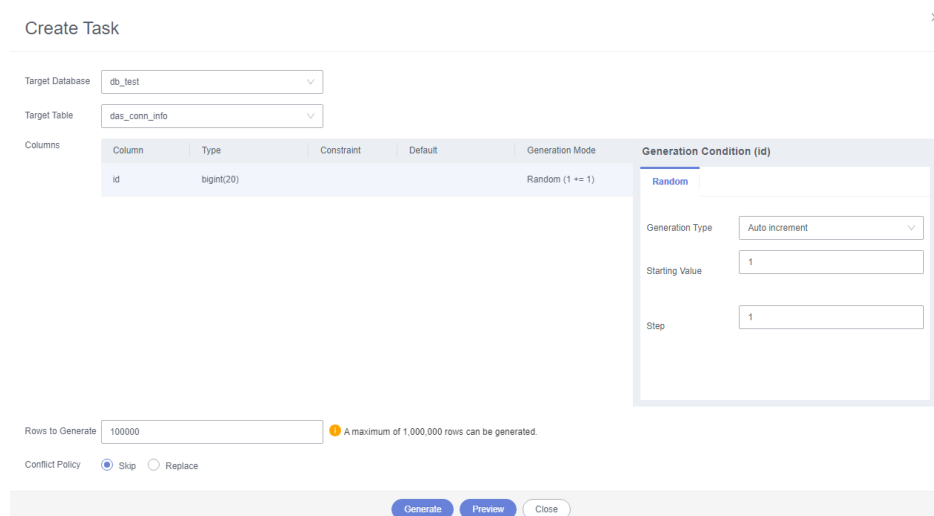
Figure 3-109 Creating a data generation task



Task ID	Target Database & Table	Conflict Policy	Created	Updated	GeneratedTotal	Progress	Status	Operation
1330	'create_test_db1'.'test'	Ignore	2020-09-03 11:07:40	2020-09-03 11:07:42	100,000/100,000	100%	Completed	Details Open Table SQL Window
1311	'test'.'test'	Ignore	2020-09-28 22:00:18	2020-09-28 22:00:18	1,000/1,000	100%	Completed	Details Open Table SQL Window
1229	'create_test_db1'.'test_'	Ignore	2020-09-18 14:25:13	2020-09-18 14:25:33	1,000,000/1,000,000	100%	Completed	Details Open Table SQL Window
1193	'test_db'.'table_001'	Ignore	2020-08-12 19:50:27	2020-08-12 19:51:43	1,000,000/1,000,000	100%	Completed	Details Open Table SQL Window
0550	'test_db1'.'table_001'	Ignore	2020-07-20 12:59:33	2020-07-20 12:59:33	100/100	100%	Completed	Details Open Table SQL Window
0449	'test_db1'.'table_001'	Ignore	2020-07-20 12:59:22	2020-07-20 12:59:22	100/100	100%	Completed	Details Open Table SQL Window
0448	'test_db'.'test_001'	Ignore	2020-07-20 11:01:45	2020-07-20 11:01:45	100/100	100%	Completed	Details Open Table SQL Window
0447	'test_db'.'table_002'	Ignore	2020-07-20 11:01:34	2020-07-20 11:01:34	100/100	100%	Completed	Details Open Table SQL Window
761	'test_vc'.'testtabletest'	Ignore	2020-05-15 11:48:34	2020-05-15 11:48:34	1,000/1,000	100%	Completed	Details Open Table SQL Window
740	'testvcg'.'students2'	Ignore	2020-05-07 10:23:21	2020-05-07 10:24:19	1,000,000/1,000,000	100%	Completed	Details Open Table SQL Window

Step 8 In the displayed dialog box, configure required parameters

Figure 3-110 Configuring task parameters



Create Task

Target Database:

Target Table:

Column	Type	Constraint	Default	Generation Mode	Generation Condition (id)
id	bigint(20)			Random (1 = 1)	<p>Random</p> <p>Generation Type: <input type="text" value="Auto increment"/></p> <p>Starting Value: <input type="text" value="1"/></p> <p>Step: <input type="text" value="1"/></p>

Rows to Generate: ● A maximum of 1,000,000 rows can be generated.

Conflict Policy: Skip Replace

- **Rows to Generate**
A maximum of 1,000,000 rows of data can be generated.
- **Conflict Policy**
If you select **Skip**, the system skips data rows in conflict and continues generating data.
If you select **Replace**, the system replaces existing rows with new ones that have the same primary key.
- **Generation Mode**
You can set the rules for randomly generated data based on the column settings. For example, if the column type is time, you can set the start time, end time, and format, or select **Based on current time**.

Step 9 Click **Preview** to check whether the data that will be generated can meet your requirements. If not, adjust the generation rules.

Figure 3-111 Data preview

Preview ×

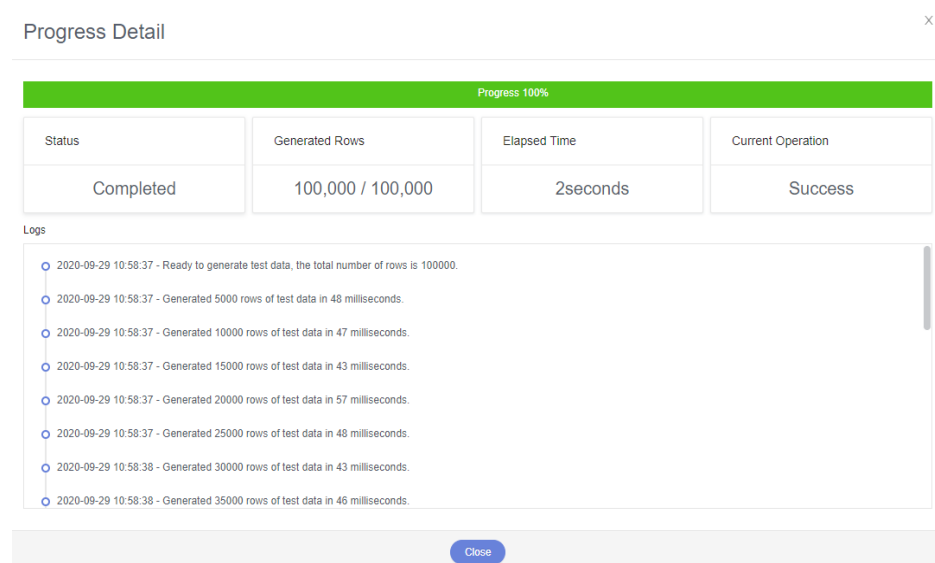
id	status	created_by	valid
1)Xkf	1	1
2	2%8	2	2
3	zQq;	3	3
4	bASWD	4	4
5)K#r(5	5
6	-Uvr8	6	6
7	J?	7	7
8	Zl3zeOjh	8	8
9	W7E&0j-S	9	9
10	<?IXK4	10	10

Total Records: 100 < 1 2 3 4 5 ... 10 >

[Close](#)

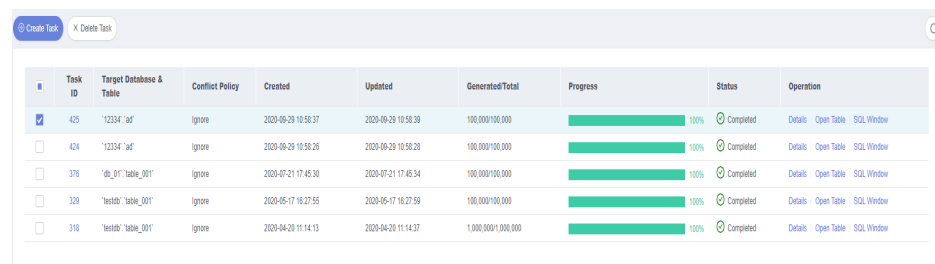
Step 10 Click **Generate**.

Figure 3-112 Test data generation progress



Step 11 In the task list, locate the created task and click **Details**.
You can also delete the task as required.

Figure 3-113 Task list



----End

3.12 Tracking and Rolling Back Data (Not Promoted)

The data tracking and rollback function helps you track and roll back data changes. This section describes how to track and roll back data changes.

This function can be used to:

- Audit core data changes, collect change statistics, and view sensitive information. For example, you can use this function to query bank statements, statistics on new orders, and key change history of a configuration table.
- Roll back data misoperations, recover the data deleted by mistake, and restore changed data to the original status. For example, the WHERE condition is not added when DBAs update data, configuration data is deleted by mistake, a large amount of dirty data and impacts are generated due to bugs.


Prerequisites

- You have enabled the data tracing and rollback function.
- The binlog function has been enabled for the destination database.

Data Tracking

Step 1 Log in to the Huawei Cloud console.

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Data Scheme > Data Tracking and Rollback**.

Figure 3-114 Viewing task details



- Search for a task by time range or database name.
- In the task list, locate the task and click its ID to view details.
- In the task list, click **View Task** in the **Operation** column. Then, you can view task information, search logs, and rollback tasks.
- If a task is not required any longer, you can select it and click delete in the upper left corner. Change history of the task will be deleted from the DAS storage.

NOTE

The default validity period of a data tracking task is 15 days. Once a task expires, the system automatically retrieves and deletes the changes in DAS.

Step 7 On the displayed page, click **Create Tracking Task**.

Step 8 In the displayed dialog box, configure required parameters.

Figure 3-115 Creating a tracking task

×

Create Tracking Task

1 Specify Details
2 Precheck
3 Read Logs

* Task Name

* Time Range

Must be within 3 hours of start time.

* Database Name

Table Name

Table Name

test_tb

The trace task obtains table structure data from the current instance because the Binlog file does not contain the structure data of tables. If there are tables that have columns added or deleted during the selected time range, the Binlog parsing will fail.

Data Tracking Type Update Insert Delete DDL

Precheck
Cancel

Table 3-12 Parameters of a tracking task

Parameter	Description
Task Name	Task name, which is user-defined.
Time Range	Time range for data tracking. You are advised to select a time span less than 3 hours.
Database Name	Database whose data is to be tracked.
Table Name	Select a table to be searched. Multiple tables can be added.
Data Tracking Type	You can select multiple tracking operations. The following four options are supported: <ul style="list-style-type: none"> ● Update ● Insert ● Delete ● DDL

NOTE

Users who create a tracking task for the first time need to view and agree to the data security agreement.

Step 9 Click **Precheck** to search for binlog files based on the selected time range.

- RDS instances with the backup function enabled periodically back up binlog files and store them to your OBS bucket. The backup delay is no more than five minutes.
- When you create a tracking task, there may be no changes in the latest five minutes. In this case, you can create a task again later.

Step 10 After the precheck is successful, click **Read Logs** to obtain log details.

When reading logs, the system initiates binlog parsing and stores log changes for filtering and displaying data.

Figure 3-116 Reading logs

View Detail(id: 260) ×

Specify Details — Precheck — **3** Read Logs

Log Name	File Size	Log Started	Log Ended	Status	Operation
mysql-mysql-...	10 KB	2020-09-08 15:56...	2020-09-08 16:01...	✓ Read ...	Log Search

Log Search Previous Cancel

NOTE

- You can search for logs only after all logs are successfully read.
- If a new task is started before the last tracking task is completely read, it is normal that the log start time is later than the end time.

Step 11 After the logs are read, click **Log Search** to obtain details about change events.

- On the **Log Search** page, you can view information about the change events, such as event IDs, change time, change types, table names, impacted rows, and descriptions.

- You can also view data or rollback statements in the **Operation** column.

Figure 3-117 Searching for logs

Event ID	Occurred	Change Type	Table Name	Impacted Rows	Action	Operation
1	2023-07-14 10:51:18	DDL	test	...	DDL operation is performed on table test, impacting ...	View DDL Statement
2	2023-07-14 10:51:42	Insert	test	1	Insert operation is performed on table test, impacting 1 rec...	View Data View Rollback Statement
3	2023-07-14 10:51:42	Insert	test	1	Insert operation is performed on table test, impacting 1 rec...	View Data View Rollback Statement
4	2023-07-14 10:51:42	Insert	test	1	Insert operation is performed on table test, impacting 1 rec...	View Data View Rollback Statement
5	2023-07-14 10:51:42	Insert	test	1	Insert operation is performed on table test, impacting 1 rec...	View Data View Rollback Statement
6	2023-07-14 10:51:42	Insert	test	1	Insert operation is performed on table test, impacting 1 rec...	View Data View Rollback Statement
7	2023-07-14 10:51:42	Insert	test	1	Insert operation is performed on table test, impacting 1 rec...	View Data View Rollback Statement
8	2023-07-14 10:51:42	Insert	test	1	Insert operation is performed on table test, impacting 1 rec...	View Data View Rollback Statement
9	2023-07-14 10:51:42	Insert	test	1	Insert operation is performed on table test, impacting 1 rec...	View Data View Rollback Statement
10	2023-07-14 10:51:42	Insert	test	1	Insert operation is performed on table test, impacting 1 rec...	View Data View Rollback Statement

----End

Rolling Back Data





- Step 1** Log in to the Huawei Cloud console.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Data Scheme > Data Tracking and Rollback**.
- Step 7** Locate the task you want to view and click **View Task** in the **Operation** column.

Figure 3-118 Viewing task details

Task ID	Task Name	Database Name	Table Name	Event Type	Time Range	Status	Progress	Operation
<input type="checkbox"/> 474	test001	db_test	test	Update, Insert, Delete, DDL	2023-07-14 09:00:00 — 2023-07-14 10:56:00	 Logs read successful	<div style="width: 100%;"><div style="width: 100%;"></div></div> 100%	View Task
<input type="checkbox"/> 473	test	db_test	test	Update, Insert, Delete, DDL	2023-07-14 10:48:23 — 2023-07-14 10:52:03	 Logs read successful	<div style="width: 100%;"><div style="width: 100%;"></div></div> 100%	View Task

- Step 8** On the **Log Search** page, click **Create Rollback Task**. Alternatively, on the **Rollback Task List** page, click **Create Rollback Task**.
- Step 9** In the displayed dialog box, configure required parameters.

Figure 3-119 Creating a rollback task

Table 3-13 Parameters for creating a rollback task

Parameter	Description
Start Event ID	The start event ID is the one in the task list and must be entered in ascending order. You can view the event ID by referring to Step 11 .
End Event ID	The end event ID is the one in the task list and must be entered in ascending order. You can view the event ID by referring to Step 11 .
Rollback Statement Storage	Enter an OBS bucket. To keep your data secure, DAS stores rollback statements in the OBS bucket you provide. In this way, DAS automatically connects to your OBS bucket for in-memory reading. Your data will never be flushed to any storage media of DAS. Creating OBS buckets is free of charge, but saving files will incur certain costs.
Charset	Specify a character set.

Parameter	Description
Statement Type	<ul style="list-style-type: none"> • Generate event rollback SQL statements: generates SQL statements for rolling back reverse changes based on the images before and after data change. • Obtain the original data before changes: generates rollback tables and insert statements by mirroring before data change.
Advanced Settings	You can also set Data Tracking Type , Table Name , Field , and Field Content under Advanced Settings as required.

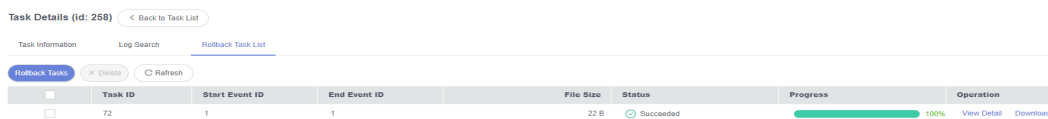
 **NOTE**

Changing a record (primary key) three consecutive times (for example, 1->2->3->4) equals the change of 1 to 4 (1->4).

Step 10 Click **OK**.

Step 11 In the rollback task list, view the created rollback task.

Figure 3-120 Viewing the created rollback task



Task ID	Start Event ID	End Event ID	File Size	Status	Progress	Operation
72	1	1	22 B	Succeeded	100%	View Detail Download

- Locate the rollback task you created and click **View Detail** in the **Operation** column.
- Click **Download** in the **Operation** column to download the original data before data change and event-based rollback SQL statements to your local PC.
- Enter a task ID in the search box in the upper right corner of the task list to search for the required task.
- In the **Operation** column, sort out tasks by task ID, start event ID, end event ID, file size, and status.

 **NOTE**

Changes (such as insert->delete, delete->insert, update->update) on the same record will be combined or canceled. So, the generated file may have no rollback SQL statements or original data.

----End

3.13 Task Management

3.13.1 Scheduling Tasks (Not Promoted)

DAS allows you to execute SQL statements by scheduling tasks. Scheduling types include **immediate**, **scheduled**, and **periodic**. You can select a scheduling type


when creating a task. Error control and transaction control can be performed on SQL statements during scheduling, and task dependency chains can be set for dependent SQL statements.

Concurrent tasks cannot be scheduled. To execute concurrent tasks, enable **Event Scheduler** to use the event capability provided by the database. For details, see [Enabling or Disabling Event Timer](#).

Creating a Scheduling Task

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Background Tasks > Task Scheduling**.

NOTE

You can create a scheduling task only after agreeing to save SQL statements in a database.

Step 7 On the **Scheduling Tasks** tab, click **Create Task**.

Step 8 On the displayed page, enter a task name and specify a scheduling type and execution time tolerance.

Figure 3-121 Creating a task

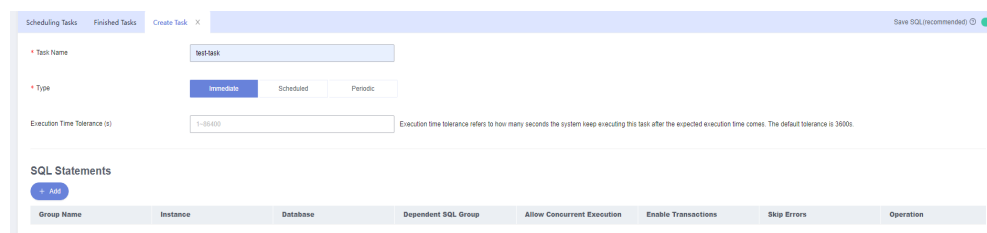


Table 3-14 Parameter description

Parameter	Description
Task Name	Task name, which is user-defined.

Parameter	Description
Type	<p>The options can be Immediate, Scheduled, and Periodic. You can set a scheduling type as required.</p> <ul style="list-style-type: none">• Immediate: indicates that a scheduled task is executed immediately after being submitted. The task is executed only once.• Scheduled: indicates that a task is executed at a scheduled point in time after being submitted. The task is executed only once.• Periodic: indicates that a task is executed periodically at the specified time after being submitted.
Execution Time Tolerance (s)	<p>Refers to how many seconds the system keep executing this task after the expected execution time comes.</p> <p>The default value is 3600. The value ranges from 1 to 86,400.</p>

Step 9 Under **SQL Statements**, click **Add**. On the displayed page, set parameters as needed and click **Save**.

Figure 3-122 Adding SQL statements

Add SQL Group
✕

* Group Name

* Instance

* Database C

* SQL Statements
Manually enter
Import

1

Skip Errors(recommended) ?

Enable Transactions(recommended) ?

Dependent SQL Group ?

Allow Concurrent Execution(recommended) ?

Table 3-15 Parameter description

Parameter	Description
Group Name	Group name, which is user-defined.
Instance	Target instance name.
Database	Associated database.
SQL Statements	You can manually input SQL statements or import existing SQL files.
Skip Errors	Configuring this parameter is recommended. After this parameter is configured, the system will skip any errors detected when SQL statements in the SQL group are being executed. If this function is disabled, the system will stop executing SQL statements.

Parameter	Description
Enable Transactions	Configuring this parameter is recommended. After this parameter is configured, SQL statements in the current SQL group will be executed as a transaction, and if a DML error occurs, a rollback will be performed. If this function is disabled, each SQL statement in the group is executed separately.
Dependent SQL Group	The system executes all SQL statements in the dependent SQL group first and then those statements in the current group.
Allow Concurrent Execution	Configuring this parameter is recommended. After this parameter is configured, the system will concurrently execute SQL statements in the current SQL group and other SQL groups, except for dependent SQL groups. CAUTION SQL statements in the current SQL group are executed still in serial mode.

Step 10 Click **Submit** at the bottom of the **Create Task** tab.

----End

Managing Scheduling Tasks

Tasks are displayed on the **Scheduling Tasks** and **Finished Tasks** tab pages by status.

- **Scheduling Tasks:** The scheduling tasks are periodic tasks that are being scheduled or paused.

On the **Task Scheduling** page, click the **Scheduling Tasks** tab.

You can search for tasks by status, scheduling type, task ID, or task name.

Figure 3-123 Searching for a task

The screenshot shows the 'Scheduling Tasks' tab selected. At the top, there is a search bar with a dropdown for 'Task Status', a dropdown for 'Type', and a text input field for 'Enter a task ID or task name'. Below the search bar is a table with columns: Task ID, Task Name, Type, Scheduling Plan, Last Executed, Task Status, Created, and Operation. Three tasks are listed with IDs 682, 681, and 680.

You can also perform the following operations on scheduling tasks:

- **View Details:** Click it to view the task information.

Figure 3-124 Details

The screenshot shows the 'Task Info' section for task ID 682. It displays the task name 'test-slow-071306', type 'Periodic', and scheduling plan '*S * * * * *'. Below this is the 'SQL Groups' section, which is a table with columns: Group Name, Instance, Database, Dependent SQL Group, Allow Concurrent Execution, Enable Transactions, Skip Errors, and Operation. Three groups are listed: group5, group6, and group7.

or there is an event, Cloud Eye immediately informs you of the exception through SMN.

- Step 1** Log in to the Huawei Cloud console.
- Step 2** Choose **Service List > Cloud Eye**.
- Step 3** In the navigation pane, choose **Alarm Management > Alarm Rules**.
- Step 4** Click **Create Alarm Rule** in the upper right corner.
- Step 5** On the displayed page, set parameters as prompted.
 1. Configure basic information of the alarm rule.

Figure 3-127 Basic information

Table 3-16 Parameters

Parameter	Description
Name	Alarm rule name. The system generates a random name, which you can modify. Example value: alarm-b6al
Description	(Optional) Supplementary information about an alarm rule

2. Select an object to be monitored and set alarm parameters.

Figure 3-128 Alarm parameters

Table 3-17 Alarm parameters

Parameter	Description	Example Value
Alarm Type	Alarm type, which can be Metric or Event	Metric
Event Type	If you select Event for Alarm Type , you need to select an event type, which can be System event or Custom event .	System event
Event Source	If you select Event for Alarm Type , you need to select an event source. <ul style="list-style-type: none">- If you select System event for Event Type, you need to select a cloud service for which the event is generated. Example value: Elastic Cloud Server- If you select Custom event for Event Type, the event source must be the same as the reported field and written in the <i>Service.Item</i> format.	-
Monitoring Scope	If you select Metric for Alarm Type , you need to select a resource scope to which the alarm rule applies. You can select All resources , Resource groups , or Specific resources . NOTE <ul style="list-style-type: none">- If you select All resources, an alarm will be triggered when any resource of the current cloud product meets the alarm policy. To exclude resources that do not need to be monitored, click Select Resources to Exclude.- If you select Resource groups, an alarm will be triggered when any resource in the group meets the alarm policy. To exclude resources that do not need to be monitored, click Select Resources to Exclude.- If you select Specific resources, click Select Specific Resources and select resources.	All resources

Parameter	Description	Example Value
Method	<ul style="list-style-type: none"> - Configure manually: If you select Event for Alarm Type and Custom event for Event Type, Configure manually is selected by default. - Associate template: If an associated template is modified, the alarm policy will be modified as well. <p>NOTE</p> <ul style="list-style-type: none"> ▪ If you select Cloud product for Resource Level, only changes to policies for the specified cloud product in an associated template will be automatically synchronized. ▪ If you select Specific dimension for Resource Level, only changes to policies for the specified dimension in an associated template will be automatically synchronized. 	Configure manually
Alarm Policy	<p>If you select Event for Alarm Type and Custom event for Event Type, you need to set Alarm Policy.</p> <p>If you select Custom event for Event Type, as long as an event occurs (for example, the running status is abnormal), an alarm will be triggered.</p> <p>NOTE</p> <p>A maximum of 50 alarm policies can be added to an alarm rule. If any one of these alarm policies is met, an alarm is triggered.</p>	-

3. Set alarm notification parameters as prompted.

Figure 3-129 Alarm notification parameters

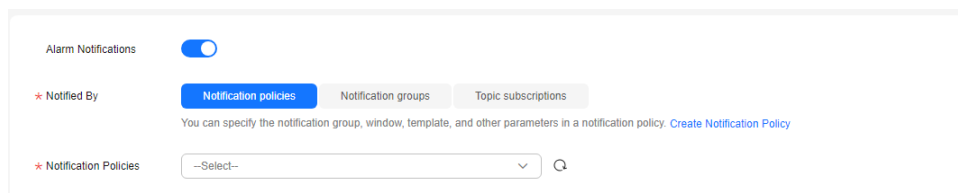


Table 3-18 Alarm notification parameters

Parameter	Description
Alarm Notifications	Whether to send notifications to users via SMS, email, voice notification, HTTP, HTTPS, FunctionGraph (function), FunctionGraph (workflow), WeCom chatbot, DingTalk chatbot, Lark chatbot, and WeLink chatbot.

Parameter	Description
Notified By	You can select Notification groups or Topic subscriptions . <ul style="list-style-type: none"> – Notification groups: Configure notification templates on Cloud Eye. – Topic subscriptions: Configure notification templates on SMN.
Notification Policies	If Notification policies is selected for Notified By , you need to select one or more notification policies. You can specify the notification group, window, template, and other parameters in a notification policy.

- In the **Advanced Settings** area, configure an enterprise project and a tag.

Figure 3-130 Advanced Settings

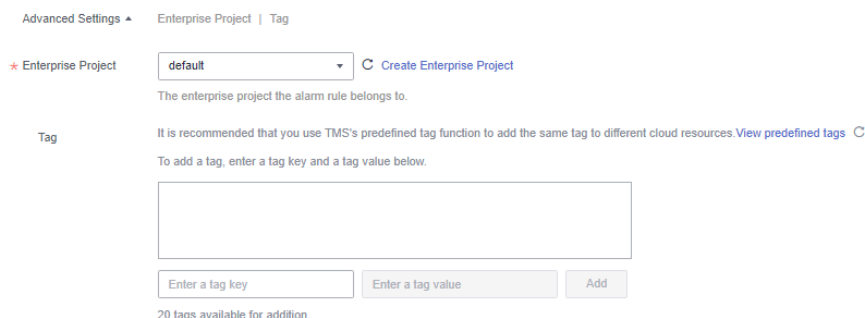


Table 3-19 Parameters

Parameter	Description
Enterprise Project	Enterprise project that an alarm rule belongs to. Only users with the enterprise project permissions can view and manage the alarm rule. For details about how to create an enterprise project, see Creating an Enterprise Project .
Tag	<p>A tag is a key-value pair. Tags identify cloud resources so that you can easily categorize and search for your resources. You are advised to create predefined tags on TMS. For details, see Creating Predefined Tags.</p> <p>If your organization has configured tag policies for Cloud Eye, you need to add tags to alarm rules based on tag policies. If a tag does not comply with the policies, an alarm rule may fail to be created. Contact your organization administrator to learn more about tag policies.</p> <ul style="list-style-type: none"> – A key can contain a maximum of 128 characters, and a value can contain a maximum of 225 characters. – A maximum of 20 tags can be created.

5. Click **Create**.

After the alarm rule is created, if a metric reaches the specified threshold, Cloud Eye will immediately inform you of an error.

----End

For more information, see [Creating an Alarm Rule](#).

3.13.2 Scheduled Backup (Not Promoted)


Scheduled backup allows you to periodically back up important database tables and data or SQL result sets so that data can be restored timely in case of data loss.

Configuring the AK/SK

Configure AK and SK before you periodically back up database tables or SQL result sets.

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

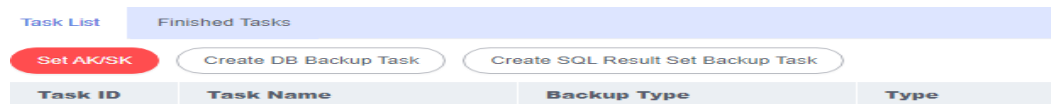
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Background Tasks > Scheduled Backup**.

Step 7 On the **Task List** tab, click **Set AK/SK** in the upper left corner.

Figure 3-131 Configuring the AK/SK



Step 8 In the displayed dialog box, specify **Storage**, enter an AK and SK, and click **Test AK/SK**. After the test succeeds, click **OK**.

Figure 3-132 Configuring AK/SK information

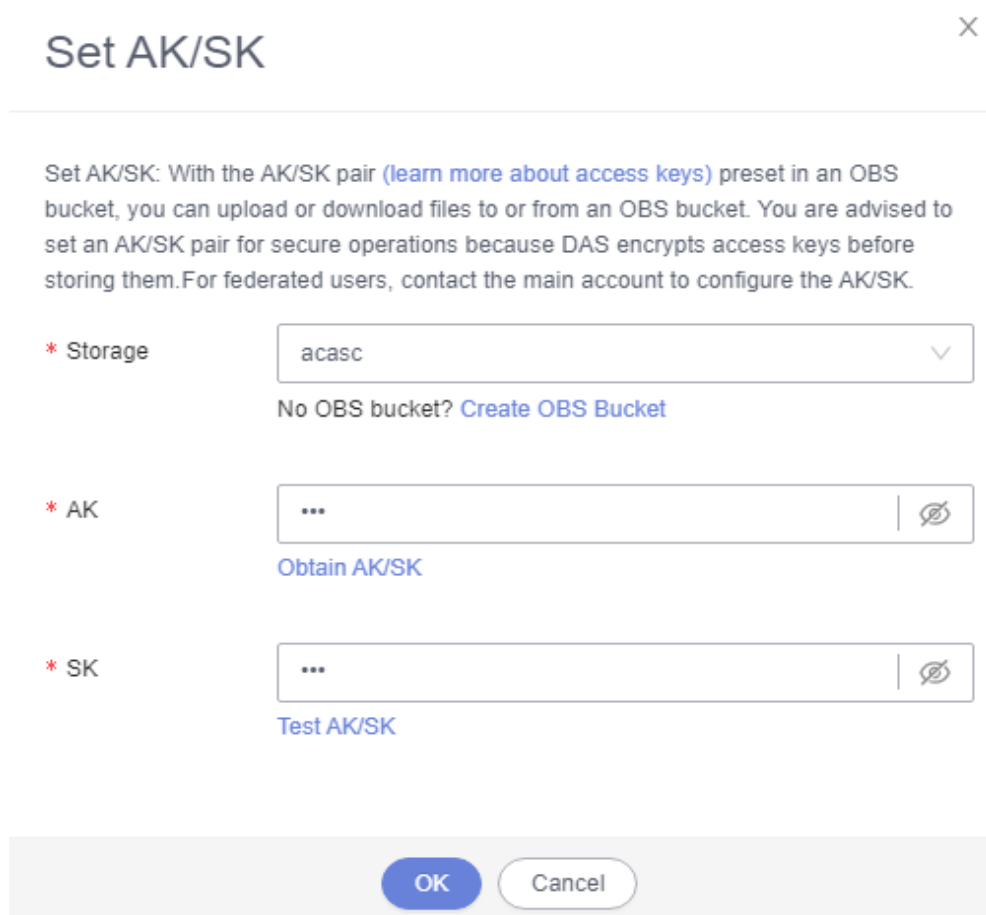




Table 3-20 Parameter description

Parameter	Description
Storage	The system stores encrypted files in OBS buckets.
AK and SK	AK and SK : Access key ID (AK) and secret access key (SK) are required credentials for you to access Huawei cloud services using development tools like APIs, CLI, and SDKs. The system uses AKs to identify users and SKs to verify encrypted signatures, ensuring that requests are secret, complete, and correct.

----End

Creating a DB Backup Task

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

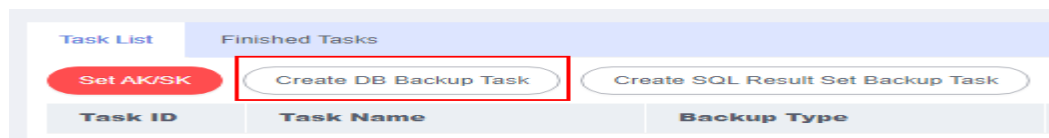
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Background Tasks > Scheduled Backup**.

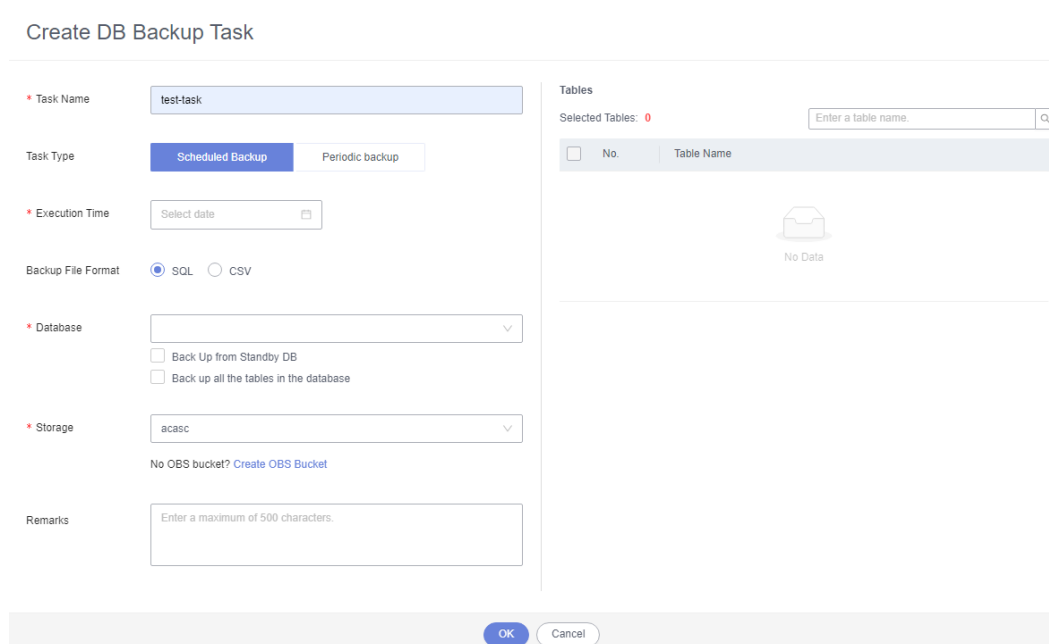
Step 7 On the task list page, click **Create DB Backup Task**.

Figure 3-133 Creating DB backup task button



Step 8 Enter a task name, select a task type, backup file format, database, and storage path, and enter remarks.

Figure 3-134 Creating a DB backup task

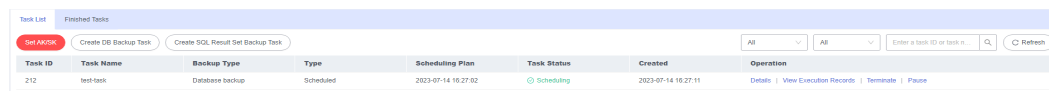


Step 9 Confirm the settings and click **OK**.

Step 10 View that the status of the current backup task is **Scheduling** in the task list.

You can also view task details and execution records and terminate or pause the task.

Figure 3-135 Viewing backup tasks



- You can click **Details** to view backup logs.
- You can click **View Execution Records** to view the backup status.
- You can click **Terminate** to end the backup task.
- You can click **Pause** suspend the backup task.

You can also click **Download** to download backup data.

Figure 3-136 Downloading backup data


Task ID	Backup Type	Database	Started	End Time	Backup Status	Operation
c74d51fe05314c47b828bd182e6d9727	Database backup	db_test	2023-07-14 16:31:30	2023-07-14 16:31:33	Successful	Details Download

----End

Creating a SQL Result Set Backup Task

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Background Tasks > Scheduled Backup**.

Step 7 On the task list tab, click **Create SQL Result Set Backup Task**.

Step 8 Enter a task name, select a task type, backup file format, database, and storage path, and enter SQL statements to be executed and remarks.

Figure 3-137 Creating a SQL result set backup task

X

Create SQL Result Set Backup Task

* Task Name

Task Type Scheduled Backup Periodic backup

* Execution Time

Backup File Format SQL_Insert CSV

* Database v
 Back Up from Standby DB

* Storage v
No OBS bucket? [Create OBS Bucket](#)

* SQL to Execute

Remarks

Enter a maximum of 500 characters.

Step 9 Confirm the settings and click **OK**.

Step 10 View that the status of the current backup task is **Scheduling** in the task list.

You can also view details and execution records and terminate or suspend a scheduling task.

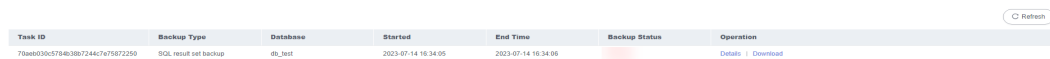
Figure 3-138 Viewing backup tasks

Task ID	Task Name	Backup Type	Type	Scheduling Plan	Task Status	Created	Operation
214	task	SQL Result set backup	Scheduled	2023-07-14 16:32:19	Scheduling	2023-07-14 16:34:01	Details View Execution Records Terminate Pause

- You can click **Details** to view backup logs.
- You can click **View Execution Records** to view the backup status.
- You can click **Terminate** to end the backup task.
- You can click **Pause** suspend the backup task.

You can also click **Download** to download backup data.

Figure 3-139 Downloading backup data



Task ID	Backup Type	Database	Started	End Time	Backup Status	Operation
7baab030c574b39b7244c7a75872256	SQL resumet backup	db_test	2023-07-14 16:34:05	2023-07-14 16:34:06		Details Download

----End

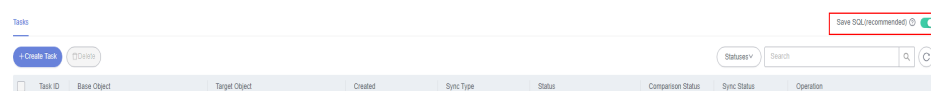
3.14 Table Structure Comparison and Synchronization (Not Promoted)

This section describes how to check the structure difference by comparing and synchronizing table structures when you perform a migration or verification.

Prerequisites

To create a table structure comparison and synchronization task, you need to toggle on **Save SQL** first so that DAS can store your data. If you do not toggle on **Save SQL**, you cannot create table structure comparison and synchronization tasks.

Figure 3-140 Enabling the function of saving SQL statements



Procedure



- Step 1** Log in to the Huawei Cloud console.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Structure Management > Table Structure Comparison and Synchronization**.
- Step 7** On the displayed page, click **Create Task**.
- Step 8** On the **Create** page, configure required parameters and click **Next**.

Figure 3-141 Creating a task

Table 3-21 Parameter description

Parameter	Description
Source Instance	The DB instance that you have logged in to by default.
Source Database	Select a source database.
Target Instance	Select Current instance or Another instance .
Target Database	Select a target database to be compared with.
Error Tolerance	Configuring this parameter is recommended. After this parameter is configured, if a comparison or synchronization error occurs during task execution, the system ignores the error and continues the execution.
Sync Type	<ul style="list-style-type: none"> ● Global: synchronizes all tables with the same name from the source database to the target one. ● Specified: synchronizes specific tables with the same name from the source database to the target one. ● One-to-one: allows you to specify a source table and target table for synchronization. The two tables can have different names. ● One-to-more: synchronizes the structure of a table in the source database to multiple tables in the target database. This option is usually selected when you want to change table structures during database and table sharding.

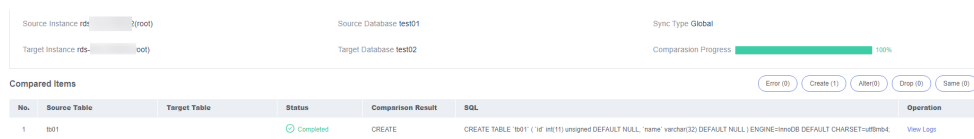
Step 9 Click **Next** to go to the **Compare** page, check task information and comparison items, and click **Compare**.

You can also select the items you want to skip and click **Skip** to cancel the comparison.

Step 10 View comparison progress.

In the comparison item list, click **View Logs** in the **Operation** column to obtain comparison details. You can also click **Download DDL** as needed.

Figure 3-142 Viewing comparison progress



Step 11 After comparison is complete, click **Next**. On the **Synchronize** page, view basic information about this comparison task, such as the source instance, source database, target instance, target database, and synchronization type, and in the synchronization item list, specify the items to be synchronized.

Skip synchronization items that may cause high risks and then click **Synchronize**.

Figure 3-143 Synchronizing data



Step 12 After synchronization is complete, click **View Logs** in the **Operation** column to obtain comparison details.

You can download DDL as required.

----End

3.15 Intelligent O&M (New Version)

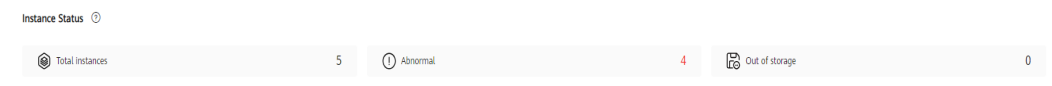
3.15.1 Dashboard

Dashboard helps you get knowledge of overall information about your instances, including instances by status, engine distribution, active alarms, slow query logs, monitoring dashboard, and resource risky instances. Intelligent Diagnosis checks instance health using instance operation data and intelligent algorithms and provides diagnosis results and suggestions.

Viewing the Instance Status

You can view the number of instances by status in the current region, including primary instances and read replicas.

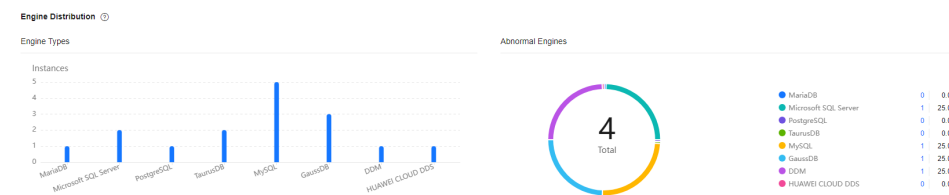
Figure 3-144 Instance status



Viewing Engine Distribution

You can view the distribution of engines in the current region, including engine types and abnormal engines.

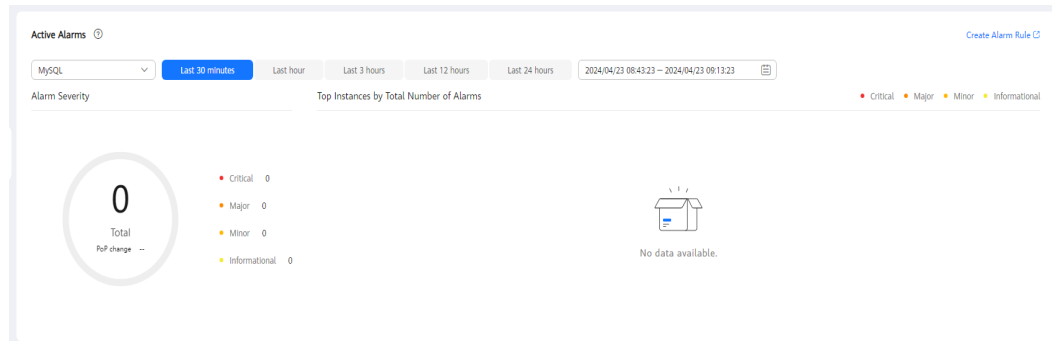
Figure 3-145 Engine distribution



Querying Active Alarms

You can view active alarms of all instances in the current region, including alarms in the Alarm (metric) and Triggered (event) statuses.

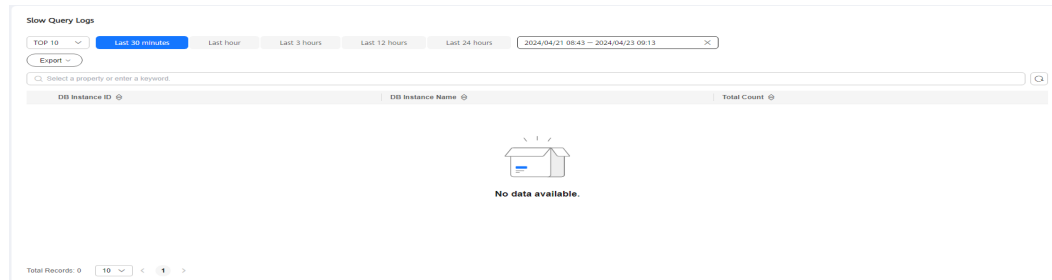
Figure 3-146 Active alarms



Viewing Slow Query Logs

You can view the number of slow query logs of all instances in the current region.

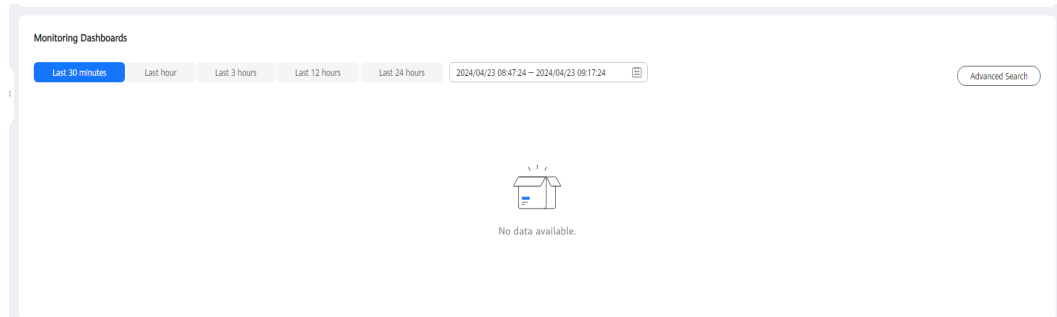
Figure 3-147 Slow query logs



Monitoring Dashboards

You can view metrics of all instances in the current region.

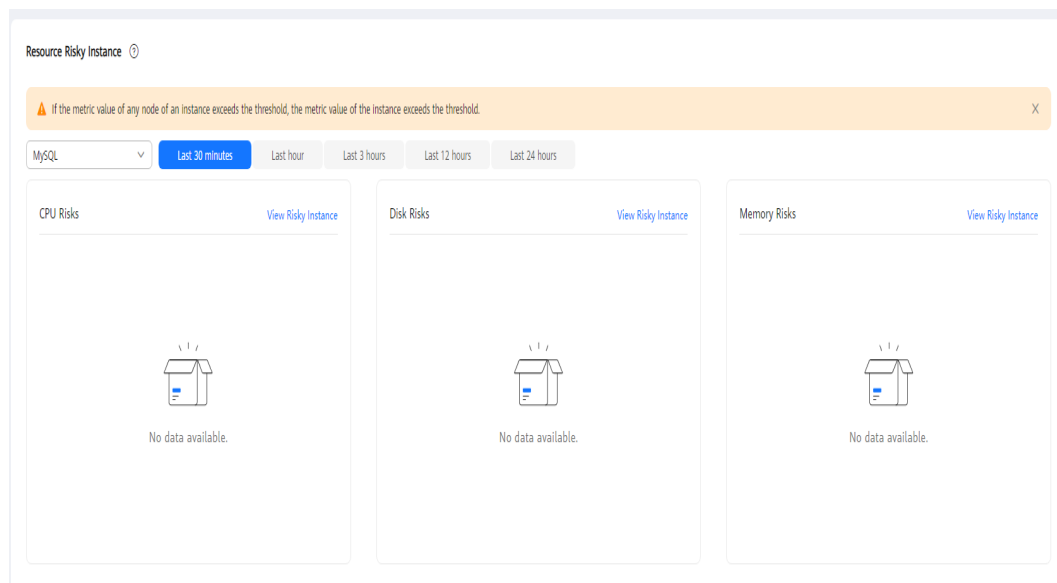
Figure 3-148 Monitoring dashboards



Viewing Resource Risky Instances

You can view metric risks of all instances in the current region.

Figure 3-149 Resource risky instances



3.15.2 Setting an Instance as Paid

Intelligent O&M is available for paid and free instances. Paid instances can enjoy more value-added functions.

For details about instance billing policies, see [Intelligent O&M Billing](#).

If you want to set an instance as paid, go to [Setting an Instance as Paid](#).


If you want to set more than one instance as paid, go to [Setting Instances as Paid](#).

If you want to set your instances as free instances, see [Setting a Paid Instance as Free](#).

Setting an Instance as Paid

Step 1 [Log in to the Huawei Cloud console.](#)

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

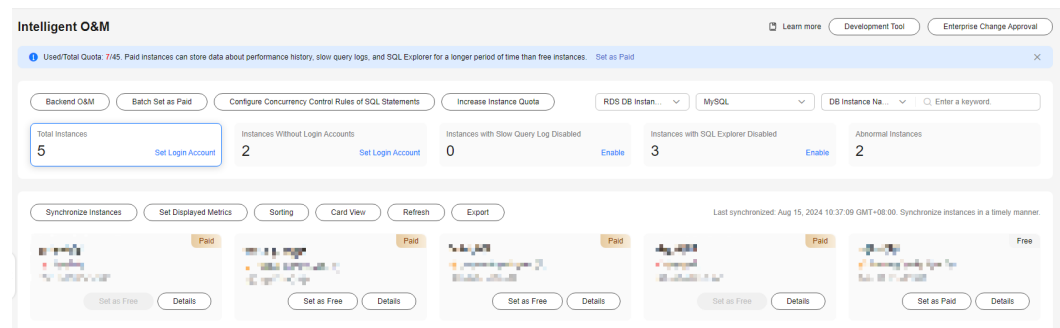
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

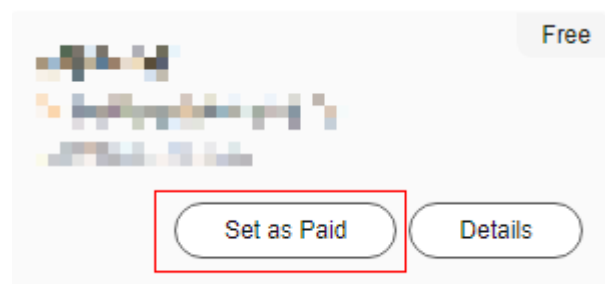
Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-150 Searching for instances



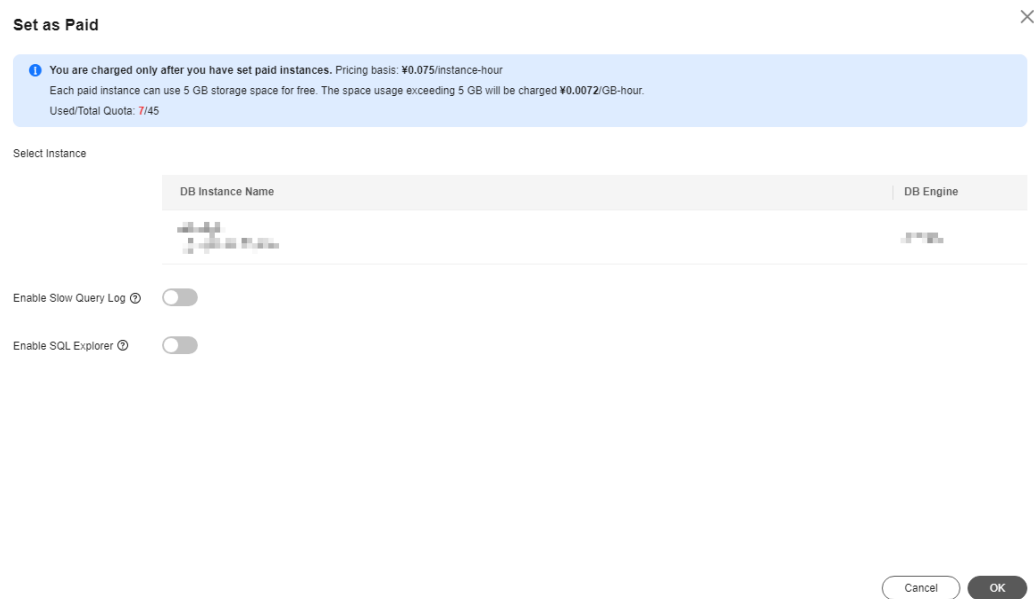
Step 6 Select the instance that you want to set as paid and click **Set as Paid**.

Figure 3-151 Setting an instance as paid



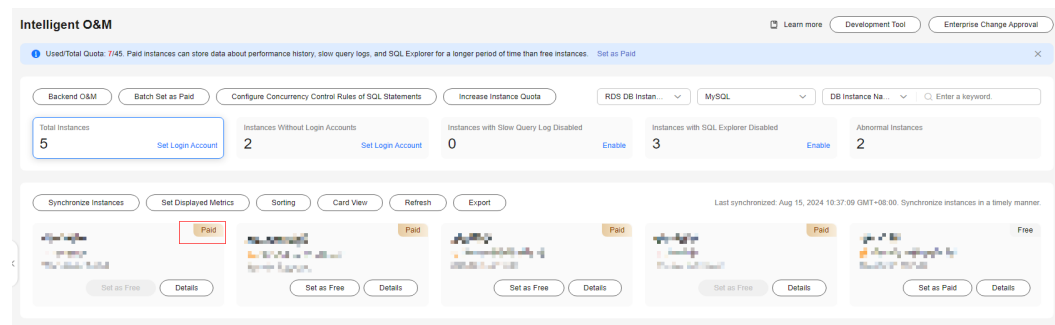
Step 7 Carefully read the information displayed in the dialog box and click **OK**.

Figure 3-152 Setting an instance as paid



Step 8 On the **Instance List** page, check whether the instance status changes to **Paid**.

Figure 3-153 Instance list




----End

Setting Instances as Paid

Step 1 [Log in to the Huawei Cloud console](#).

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

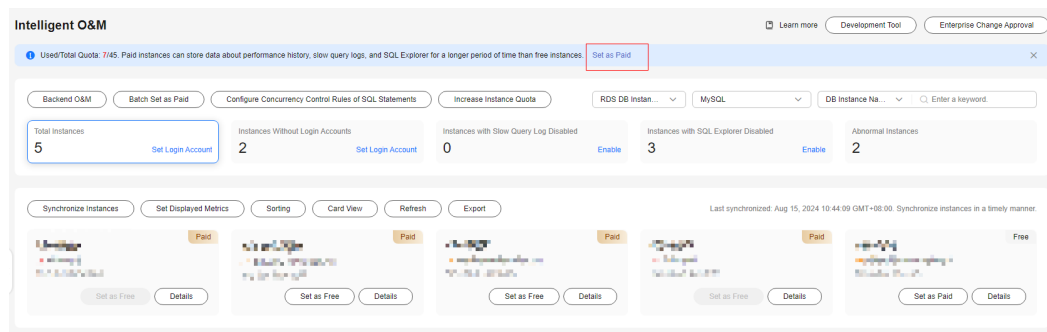
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

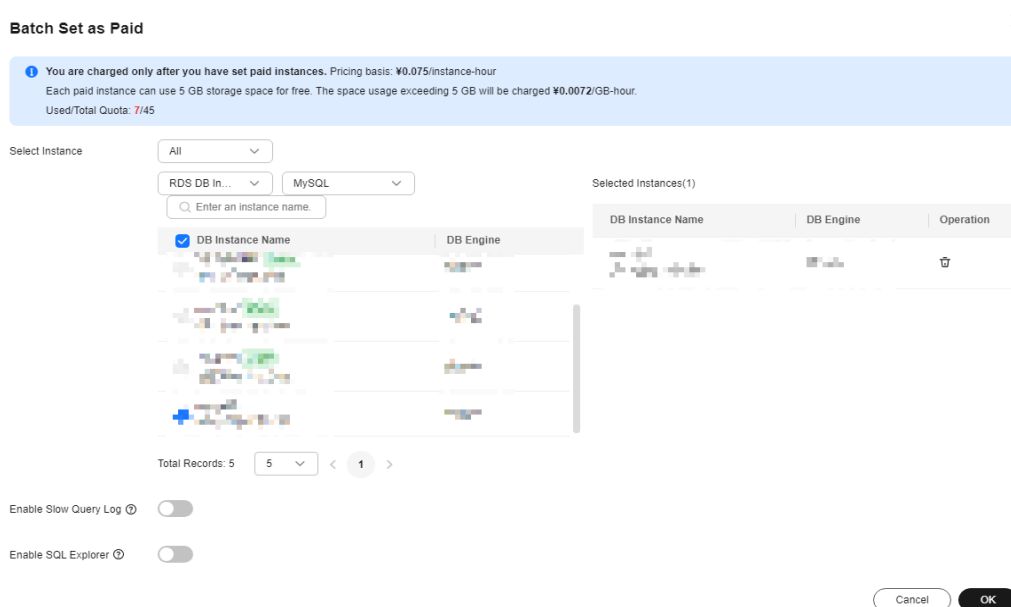
Step 5 On the displayed page, click **Batch Set as Paid** or **Set as Paid**.

Figure 3-154 Setting instances as paid



Step 6 Carefully read the information displayed in the dialog box, select the instances that you want to set as paid, and click **OK**.

Figure 3-155 Setting instances as paid




Step 7 On the **Instance List** page, check whether the instance status changes to **Paid**.

----End

Setting a Paid Instance as Free

Step 1 [Log in to the Huawei Cloud console](#).

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

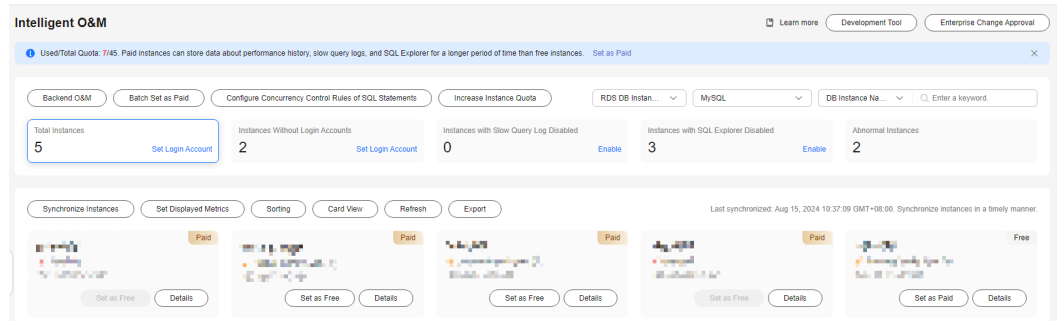
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

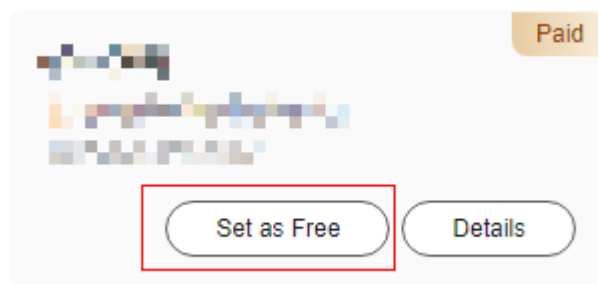
Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-156 Searching for instances



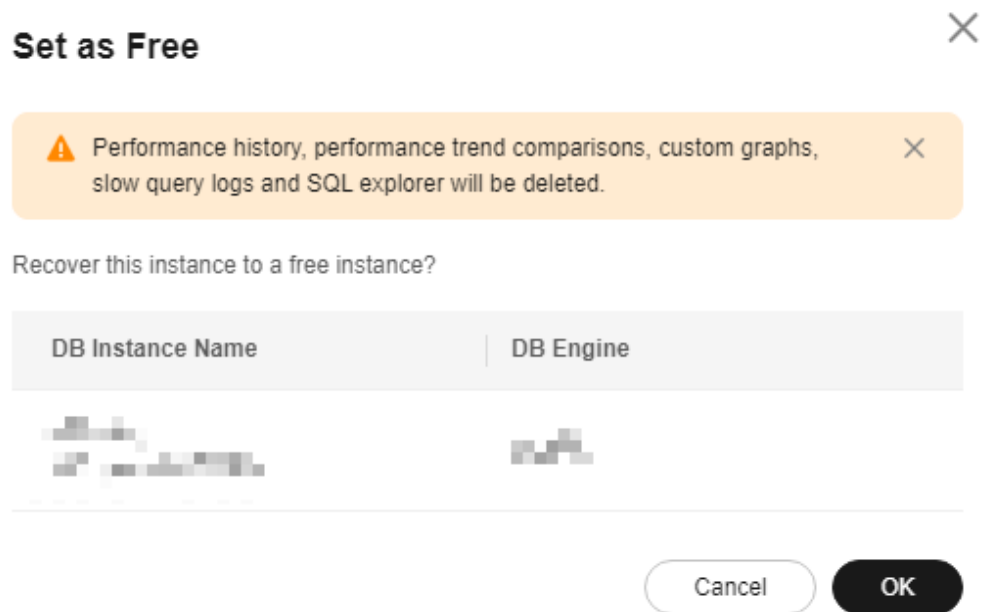
Step 6 Locate the instance that you want to set as free and click **Set as Free** on the **Instance Overview** page.

Figure 3-157 Setting an instance as free



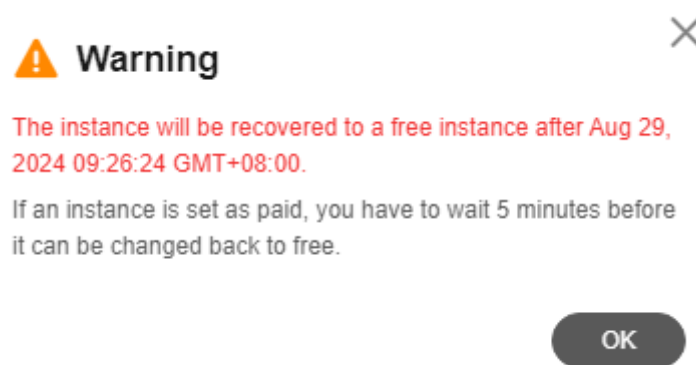
Step 7 Carefully read the information displayed in the dialog box and click **OK**.

Figure 3-158 Setting an instance as free



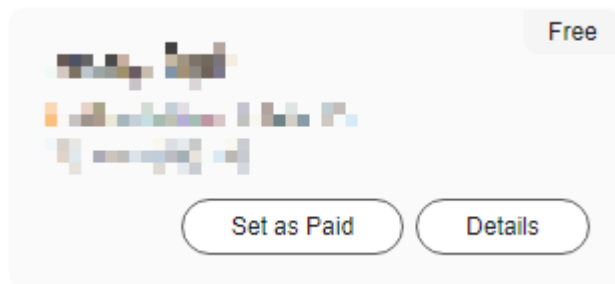
- If an instance is set as paid, you have to wait 5 minutes before it can be changed back to free.

Figure 3-159 Setting an instance as paid



- On the **Instance List** page, check whether the instance status changes to **Free**.

Figure 3-160 Instance list



----End

3.15.3 Viewing the Overall Status of an Instance

Dashboard shows the status of your instance, including alarms, resource usages, and key performance metrics. DAS diagnoses instance health using operational data analytics and intelligent algorithms, and provides you with solutions and suggestions for handling detected exceptions.



Function Modules

Table 3-22 lists the function modules of the **Overview** page.

Table 3-22 Function description

Function	Description
Alarms	Shows alarms of different severities during instance running. After you click an alarm severity, the Alarm Rules page is displayed, showing all alarm rules of the severity.
Health	Diagnoses instance health using operational data analytics and intelligent algorithms.
Resources	Shows the CPU usage, memory usage, space usage, and disk IOPS of an instance.
Key Performance Metrics	Displays vCPU utilization & slow query logs, connections, memory utilization, and disk reads/writes in the last hour.

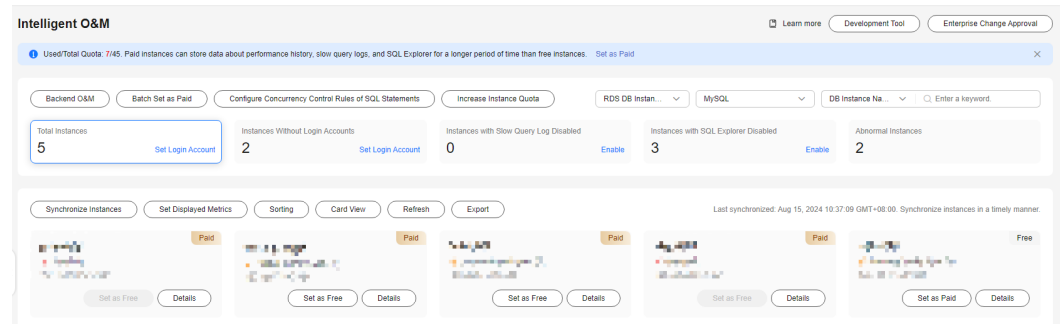
Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-161 Searching for instances



Step 6 Locate the box containing your target instance and click **Details**.

Step 7 On the **Dashboard** page, view status of the instance.

- Alarms

In the **Alarms** area, view alarm information of the current instance. To view alarm details, click the number next to an alarm severity.

Figure 3-162 Viewing alarm information

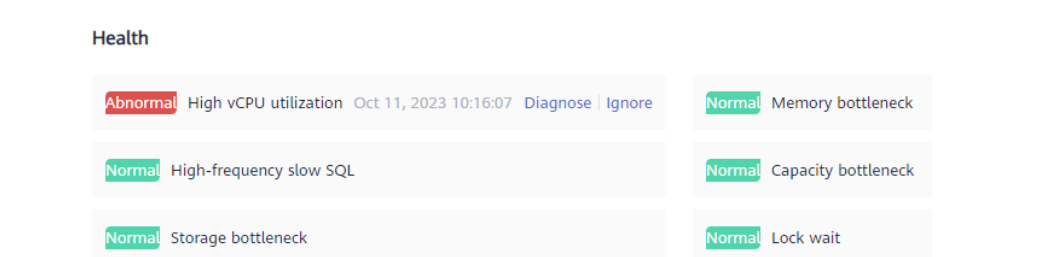


To view metrics such as CPU usage, disk usage, and connection usage, click **Alarm Rules** to configure metrics and alarm policies.

- Health

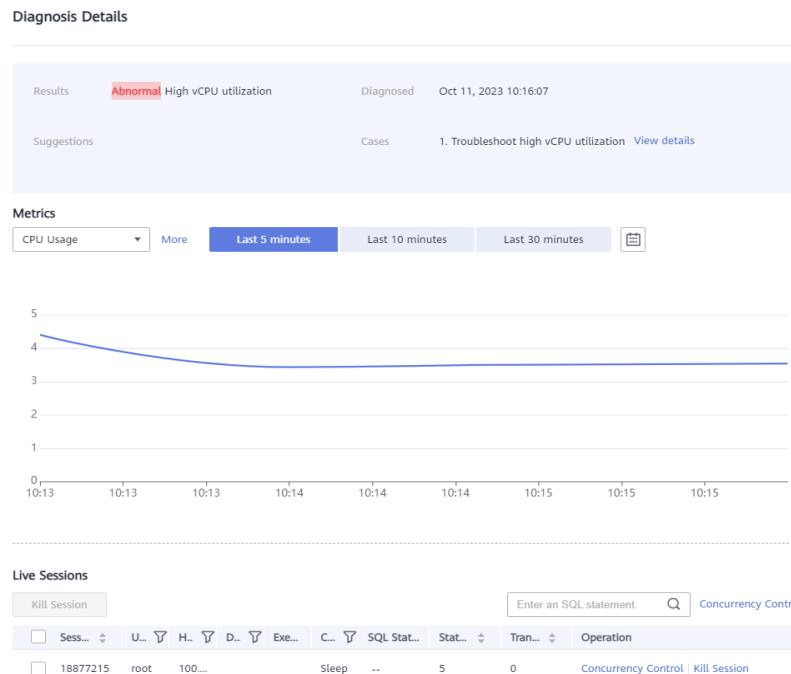
In the **Health** area, view diagnosis results of the instance.

Figure 3-163 Health



For example, if the vCPU utilization is high, click **Diagnose** to view related performance metrics and optimize service-related SQL statements or upgrade CPU specifications as suggested.

Figure 3-164 Viewing diagnosis details



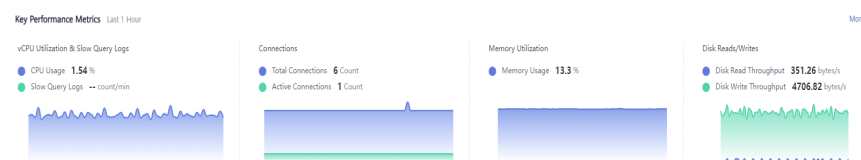
- **Resources**
In the **Resources** area, view the resource usage of the current instance.

Figure 3-165 Viewing resource usage



- **Key performance metrics**
In the **Key Performance Metrics** area, view key performance metrics in the last hour.

Figure 3-166 Viewing key performance metrics



----End


3.15.4 Real-Time Performance

The **Real-Time Performance** tab displays key metrics of your instance and allows you to compare performance of your instance by date, helping you keep track of changes of your periodic services and metrics and detect exceptions.

Procedure

Step 1 Log in to the Huawei Cloud console.

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

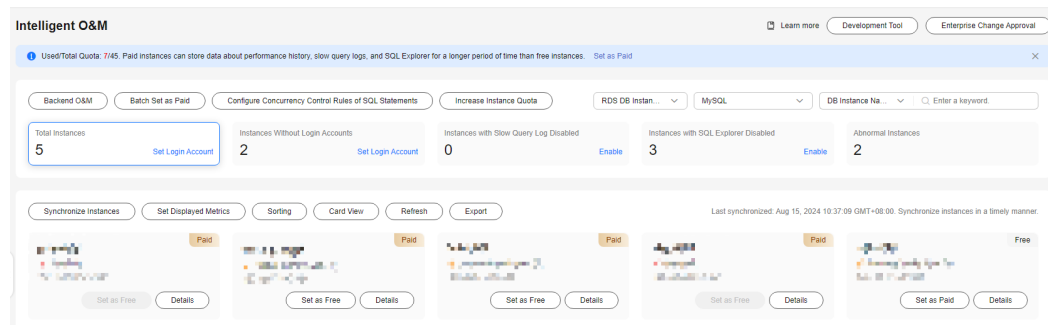
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-167 Searching for instances



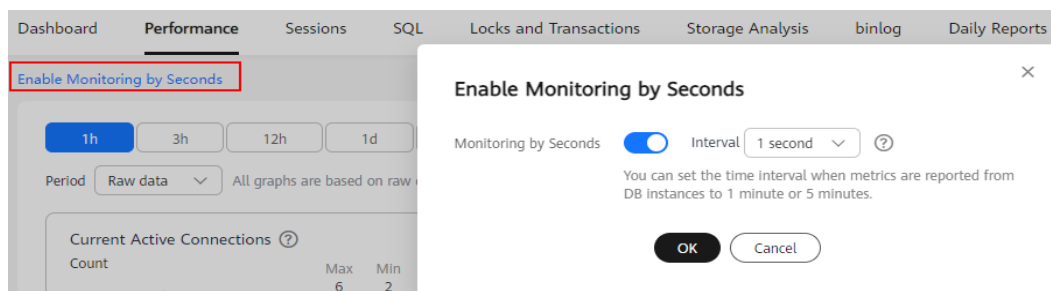
Step 6 Locate the target instance and click **Details**.

Step 7 On the **Performance** tab page, perform the following operations:

- Enable monitoring by seconds.

To improve the instantaneous accuracy of monitoring metrics, you can click **Enable Monitoring by Seconds**. In the displayed dialog box, toggle on **Monitoring by Seconds**, specify the interval, and click **OK**.

Figure 3-168 Enabling monitoring by seconds



- View the trends in metrics in the same time range on different days. You can select **Select Date for Comparison**, and specify the target comparison date and metrics to view trends in the metrics at the same time on different days.

You can place the pointer over a time point in the trend chart to view the metric at the time point on different days.

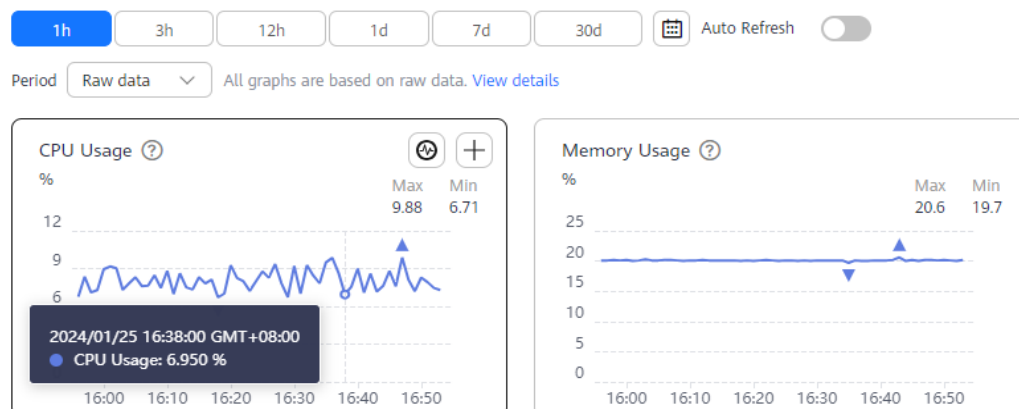
Figure 3-169 Performance comparison



- View real-time performance of the instance. You can deselect **Select Date for Comparison**, set a time range or select **1h**, **3h**, or **12h** to view real-time metrics of the instance.

You can place the pointer over a time point in the trend chart to view the metric at this time point.

Figure 3-170 Viewing performance metrics



- Customize the time range you wish to view.




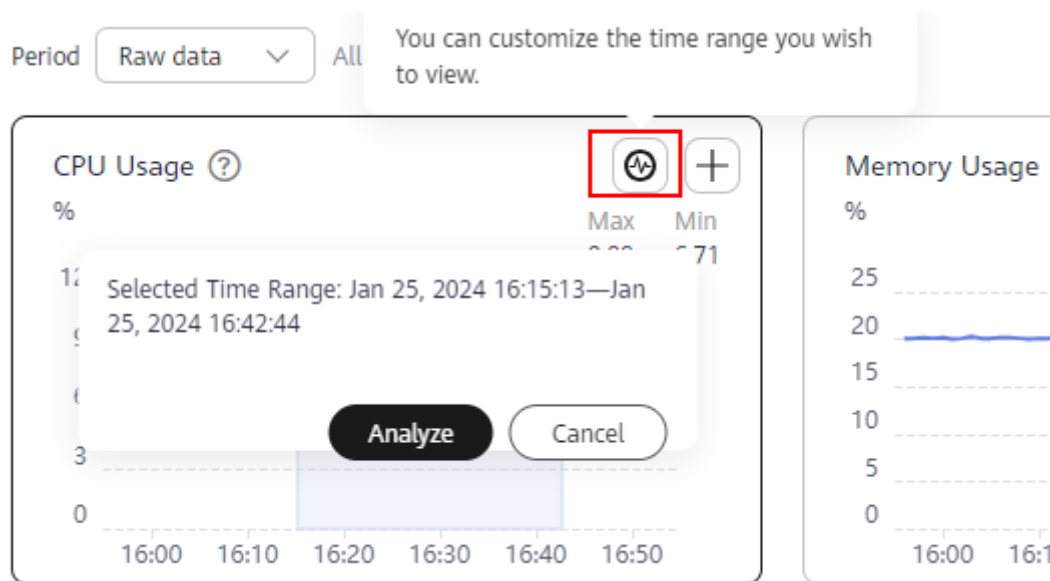
After clicking , you can drag the mouse on the chart to select a period of time. Then, you can click **Analyze** to go to the **Slow SQL Logs** page and analyze slow query logs in the time period.

Figure 3-171 Locating and analysis

----End

3.15.5 Real-Time Sessions

The real-time session function allows you to query session snapshots of your instance and can sort out and display only the required snapshots. You can quickly search for slow or active sessions in multiple dimensions like users, host IP addresses, and database names. DAS allows you to kill sessions to restore your instance, securing your database availability.

Usage Notes

Killing a session may cause instance or service exceptions.

Procedure



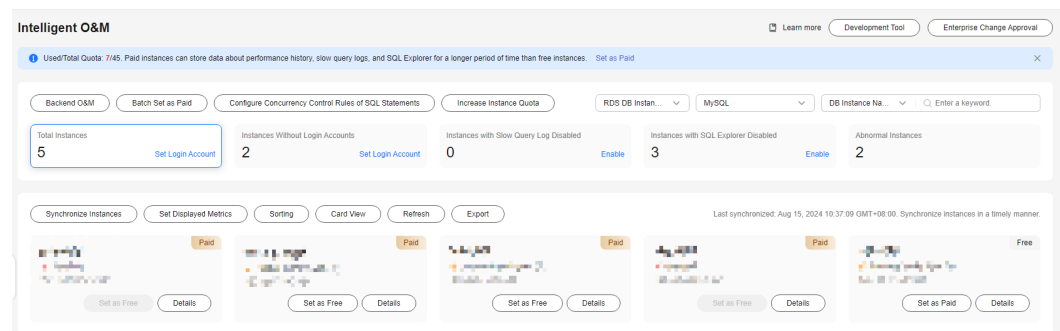
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

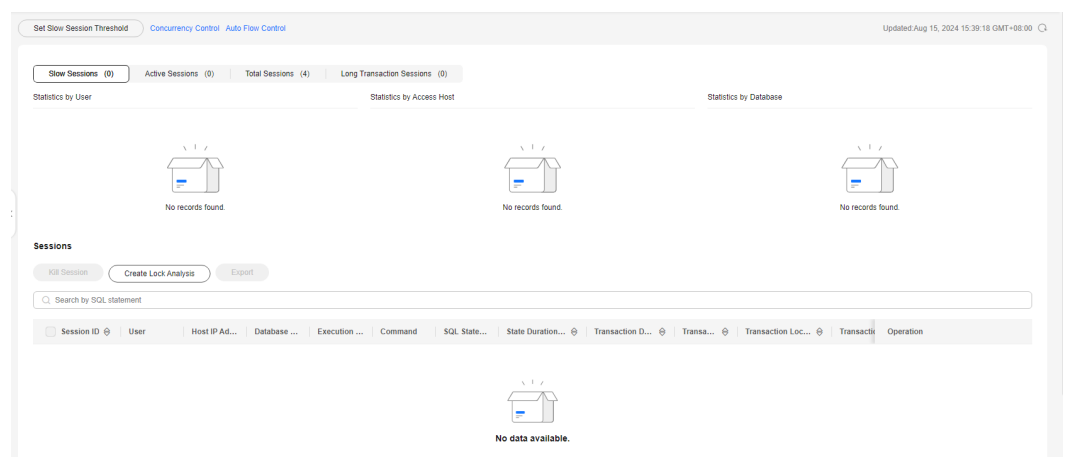
Figure 3-172 Searching for instances

Step 6 Locate the target instance and click **Details**.

Step 7 On the **Sessions** tab page, perform the following operations:

- View session statistics.

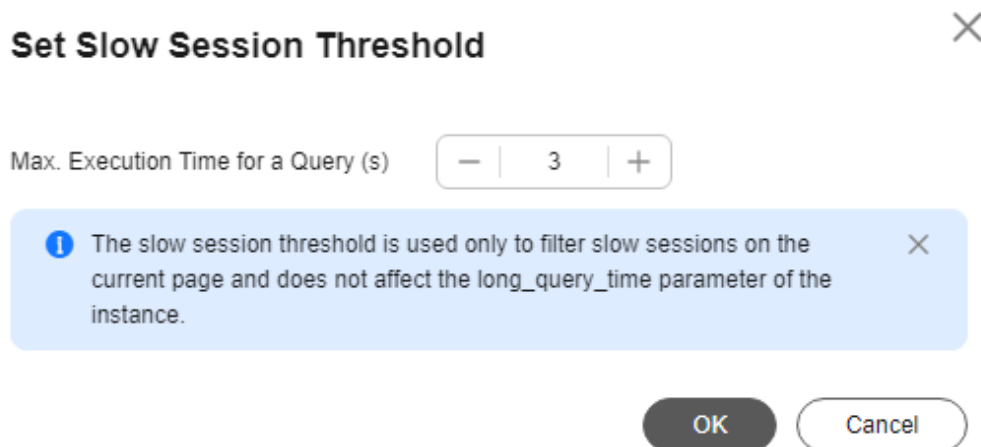
You can view statistics on the number of slow sessions, number of active sessions, and total number of sessions by user, access host, or database.

Figure 3-173 Real-time sessions

- Set a slow session threshold.

Click **Set Slow Session Threshold**. In the displayed dialog box, set **Max. Execution Time for a Query (s)** and click **OK**. Sessions whose execution time exceeds the threshold are automatically displayed in the session list.

Figure 3-174 Setting a slow session threshold



- Kill abnormal sessions if necessary.
In the session list, you can view session details. You can also select the abnormal session you want to end based on session status and service requirements and click **Kill Session** to recover the database.

----End

3.15.6 SQL

3.15.6.1 Slow Query Logs

This section describes how to analyze slow query logs in a specified period. Slow Query Log displays a chart of SQL statements that are taking too long to execute and allows you to sort slow SQL statements by multiple dimensions, such as by user, host, or SQL template. It helps you quickly identify bottlenecks and improve instance performance.

Usage Notes


- Enabling **Collect Slow Query Logs** is a must for slow query logs analysis. After it is enabled, DAS stores the slow query logs for analysis.
- Slow query logs of free instances are retained for only one hour. For paid instances and free instances that you have subscribed to **Intelligent O&M** for, their slow query logs are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.
- You can enable the slow query logs function for a maximum of 10 free instances. There is no such a limit on paid instances.
- For free instances, you can only view slow query logs generated in the latest hour.
- Slow Query Log cannot record all SQL data. As for RDS for MySQL, it has the following constraints:
 - Any slow query log that exceeds 10 KB or whose number of lines exceeds 200 is discarded by default.

- Version restriction: None

Viewing Slow Query Logs

Step 1 Log in to the Huawei Cloud console.

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

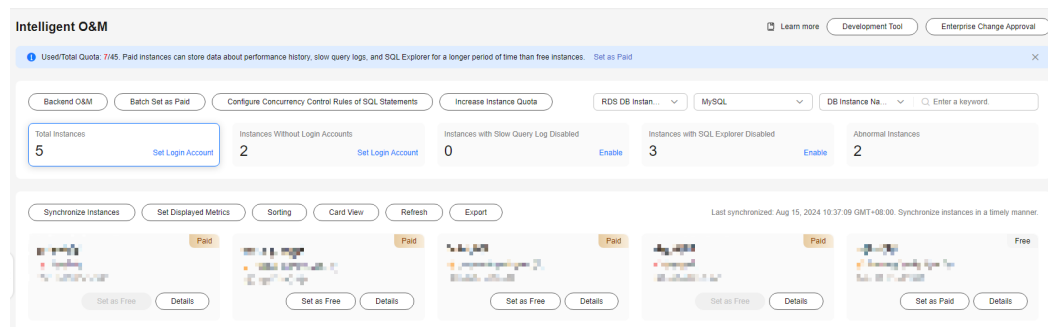
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-175 Searching for instances

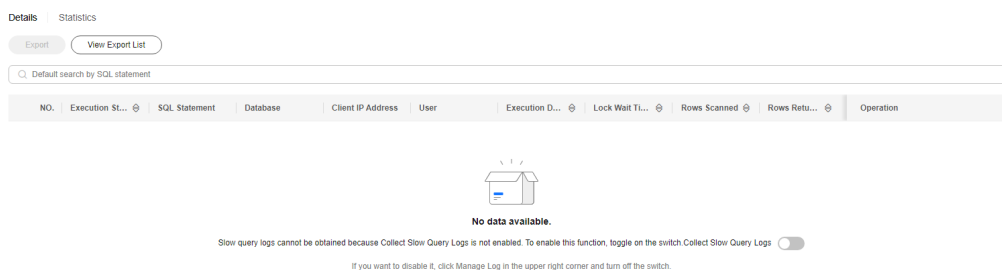


Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL** > **Slow Query Logs**.

If **Collect Slow Query Logs** is not enabled, enable it as prompted in the **Details** area.

Figure 3-176 Enabling slow query logs collection



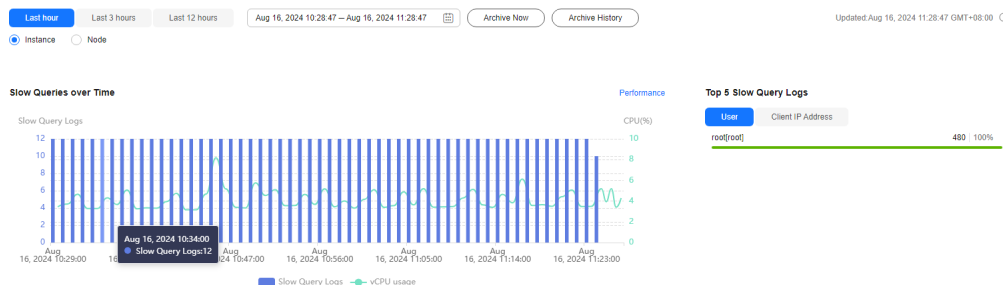
You can also click **Log Settings** in the upper right corner of the page to enable **Collect Slow Query Logs**.

Step 8 On the **Slow Query Logs** tab page, perform the following operations:

- View slow queries over a specified period of time.

Select a time range (last hour, last 3 hours, last 12 hours, or a user-defined time range which must be within three days) to view slow queries in the time range.

Figure 3-177 Slow queries over time



In the chart, you can hover your mouse at any point in time to view slow query logs or CPU usage.

Above the chart, you can switch to another instance or node to view slow queries by instance or by node.

- View slow query log details.
View slow query log details in the lower part of the **Slow Query Logs** area. The details include the SQL statement, execution start time, database, client, user, execution duration, lock wait duration, and scanned and returned rows.

Figure 3-178 Viewing slow query log details

NO.	Execution St...	SQL Statement	Database	Client IP Address	User	Execution D...	Lock Wait Ti...	Rows Scanned	Rows Retu...	Operation
1	Aug 16, 2024 14...	select sleep...	czh_test	192.168.1.100	root@root	2,000.272	0	0	1	Concurrency Control Diagnose
2	Aug 16, 2024 14...	select sleep...	czh_test	192.168.1.100	root@root	2,000.264	0	0	1	Concurrency Control Diagnose
3	Aug 16, 2024 14...	select sleep...	czh_test	192.168.1.100	root@root	2,000.287	0	0	1	Concurrency Control Diagnose

Click **Export** to export slow query log details to a specified OBS bucket. A maximum of 100,000 records can be exported.

Figure 3-179 Exporting slow query log details



After the log details are exported, you can click **View Export List** to view export records. You can also download the details to your local PC or click **Delete** to delete the slow query logs.

Figure 3-180 Viewing export history

Log Export History

Created	Status	Operation
Feb 29, 2024 19:27:29	Exported	Download Delete
Feb 29, 2024 19:00:54	Exported	Download Delete
Feb 29, 2024 14:25:00	Exported	Download Delete
Feb 29, 2024 14:10:18	Exported	Download Delete
Feb 05, 2024 10:15:57	Exported	Download Delete
Feb 04, 2024 11:27:38	Exported	Download Delete
Feb 04, 2024 09:54:01	Exported	Download Delete
Jan 18, 2024 17:54:15	Exported	Download Delete
Jan 18, 2024 17:53:57	Exported	Download Delete

10 Total Records: 22 < 1 2 3 >

OK

NOTE

Slow query log details of free instances cannot be exported. To use this function, set free instances as paid instances or subscribe to **Intelligent O&M**.

Click **Concurrency Control** in the **Operation** column to create a concurrency control rule for the current SQL statement. For details, see [SQL Statement Concurrency Control](#).

- View slow query log statistics.

Figure 3-181 Slow query log statistics

Details | Statistics

Export View Export List

Default search by database

NO.	ID	SQL Templ...	Database	Executi...	Avg. Ex...	Max. E...	Avg. Lo...	Max. L...	Avg. R...	Max. R...	Avg. R...	Max. R...	Operation
1	10788057...	SELE...	ctb_test	662	2,000	2,000	0	0	0	0	0	1	View Sample Diagnose

In the template statistics list, click **View Sample** in the **Operation** column to view the sample of a SQL statement template.

Click **Export** to export a SQL template to a specified OBS bucket. A maximum of 100,000 records can be exported.

After the template is exported, you can click **View Export List** to view export records. You can also download the details to your local PC.

 **NOTE**

Slow query log statistics of free instances cannot be exported. To use this function, set free instances as paid instances or subscribe to **Intelligent O&M**.

----End

Slow Query Log Storage and Archiving

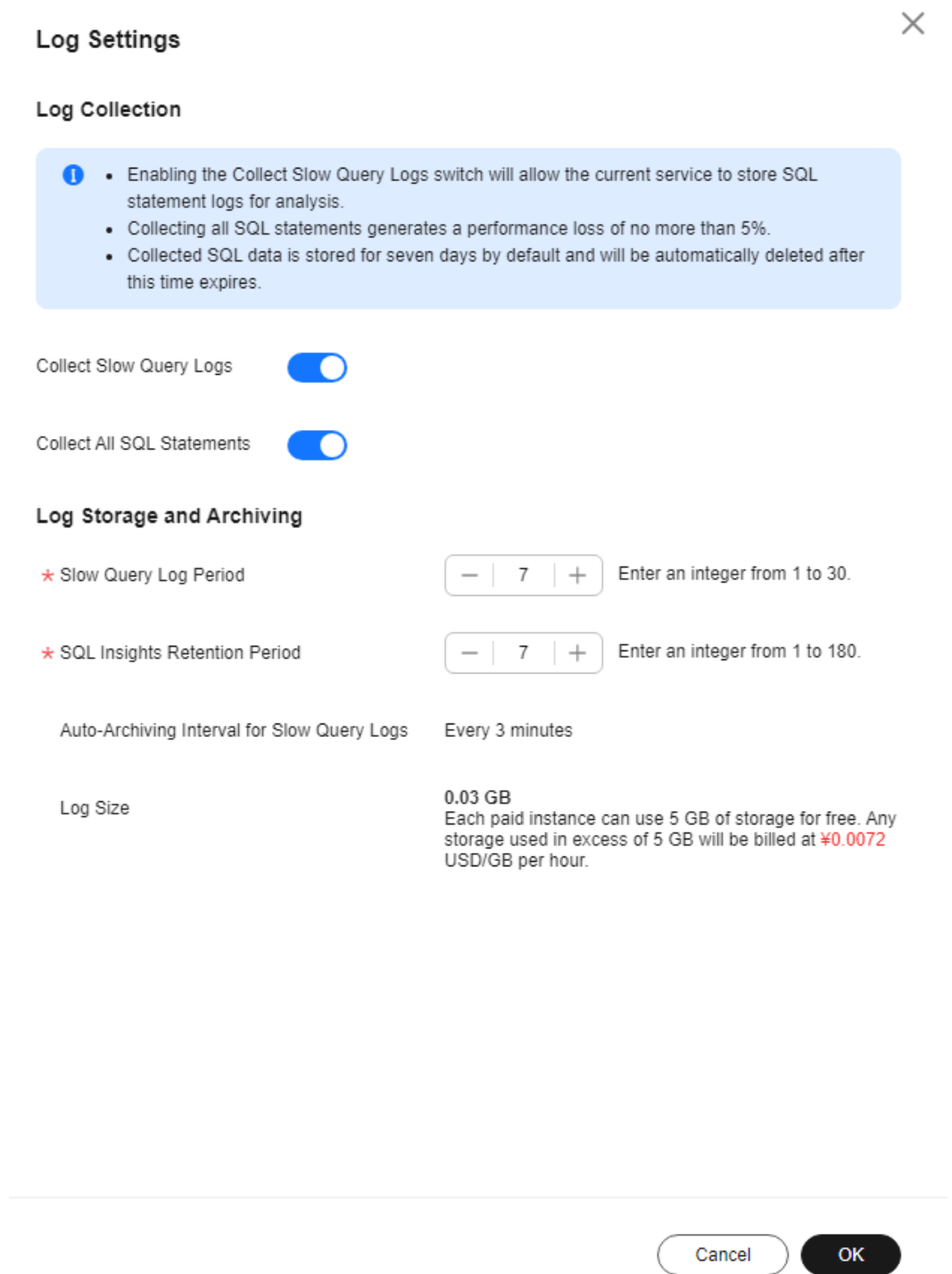
- Slow query log storage

Enabling **Collect Slow Query Logs** will allow DAS to store slow query logs for analysis.

Slow query logs of free instances are retained for only one hour. For paid instances and free instances that you have subscribed to **Intelligent O&M** for, their slow query logs are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.

For paid instances and free instances that you have subscribed to **Intelligent O&M** for, you can click **Log Settings** in the upper right corner of the **SQL** page to set slow query log retention days.

Figure 3-182 Setting storage duration for slow query logs

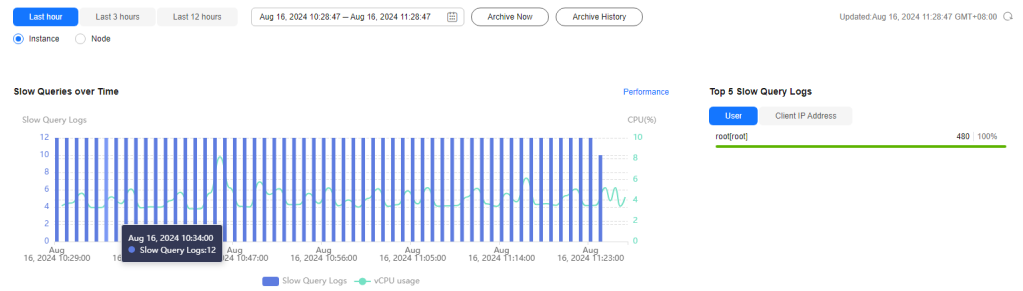


Each paid instance and free instance that you have subscribed to **Intelligent O&M** for can use 5 GB of storage for slow query logs for free. Any storage used in excess of 5 GB will be billed on a pay-per-use basis.

- Log archiving

Slow query logs are automatically archived every 3 minutes. Alternatively, you can click **Archive Now** and then view the latest statistics.

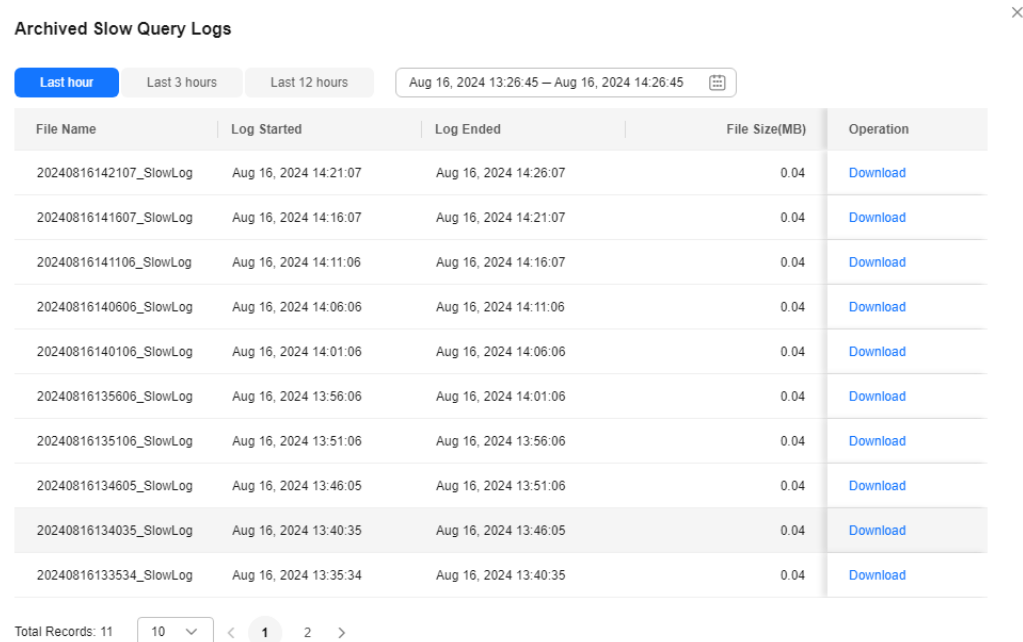
Figure 3-183 Log archiving



Slow query logs generated in the last 10 days are archived.

You can click **Archive History** to view archive records and click **Download** to download archived slow query logs to your local PC.

Figure 3-184 Viewing archive history



3.15.6.2 Top SQL

After collecting all SQL statements is enabled, Top SQL shows the SQL queries that have been contributing the most to DB load. You can sort them by multiple dimensions.

Usage Notes


- Top SQL is not available to free instances. To use this function, set free instances as paid instances or subscribe to **Intelligent O&M**.
- To use Top SQL, enable **Collect All SQL Statements** first, which is disabled by default. Collecting all SQL statements generates a performance loss of no more than 5%.

- After **Collect All SQL Statements** is disabled, new SQL statements will not be collected and the collected SQL statements will be deleted.
- SQL Explorer cannot record all SQL data. As for RDS for MySQL, it has the following constraints:
 - Some data cannot be recorded if a buffer overrun occurs.
 - Any SQL statement that exceeds 4096 bytes is discarded by default. This constraint can be removed by setting parameter **rds_sql_tracer_reserve_big_records** for RDS for MySQL 5.7.33.3 or later. You can set the parameter to **ON** by referring to [Modifying RDS for MySQL Instance Parameters](#), which means that SQL data records containing more than 4,096 bytes are still recorded.
- Data of SQL statements executed on free instances is retained for only one hour. For paid instances and the free instances that you have subscribed to **Intelligent O&M** for, SQL data is retained for seven days by default and can be retained for up to 30 days. After the retention period expires, collected SQL data is deleted.
- This function is supported only in DAS 5.6.51.1 and later, 5.7.29.2 and later, and 8.0.20.3 and later versions.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

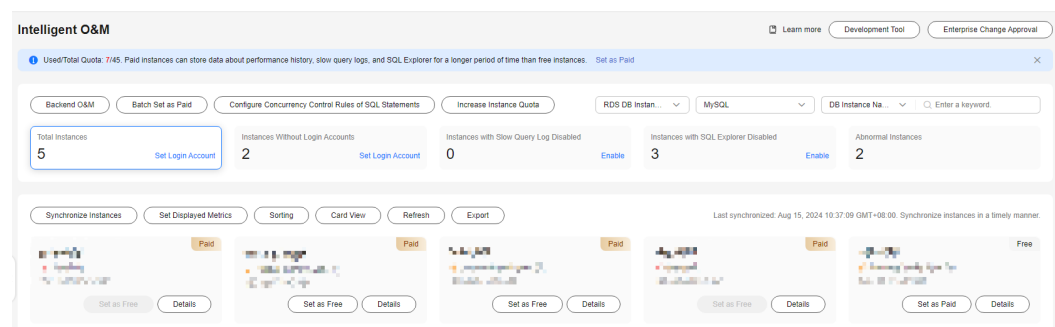
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.


Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-185 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL > Top SQL**.

Toggle on  on the right of **Collect All SQL Statements**.

You can also click **Log Settings** in the upper right corner of the page to enable **Collect All SQL Statements**.

Figure 3-186 Configuring log settings

Log Settings

✕

Log Collection

i

- Enabling the Collect Slow Query Logs switch will allow the current service to store SQL statement logs for analysis.
- Collecting all SQL statements generates a performance loss of no more than 5%.
- Collected SQL data is stored for seven days by default and will be automatically deleted after this time expires.

Collect Slow Query Logs

Collect All SQL Statements

Log Storage and Archiving

★ Slow Query Log Period	- 7 +	Enter an integer from 1 to 30.
★ SQL Insights Retention Period	- 7 +	Enter an integer from 1 to 180.
Auto-Archiving Interval for Slow Query Logs	Every 3 minutes	
Log Size	0.00 GB Each paid instance can use 5 GB of storage for free. Any storage used in excess of 5 GB will be billed at ¥0.0072 USD/GB per hour.	

Cancel OK

NOTE

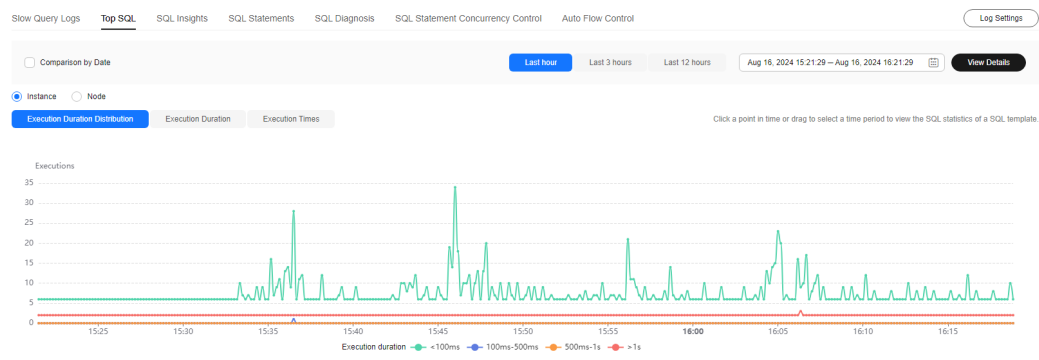
Collect All SQL Statements takes effect once it is enabled.

If you want to disable **Collect All SQL Statements**, click **Log Settings** in the upper right corner and toggle off the switch.

Step 8 On the **Top SQL** tab page, view execution duration of top SQL statements.

You can select **Last hour**, **Last 3 hours**, or **Last 6 hours** to view execution durations of top SQL statements. You can also set a time range that spans no more than one day.

Figure 3-187 Top SQL



The Execution Duration Distribution graph shows how many times SQL statements with different elapsed time lengths are executed over a specified time range. DAS collects SQL statistics of four elapsed time lengths.

- < 100 ms: number of SQL statement executions whose elapsed time is less than 100 ms
- 100 ms–500 ms: number of SQL statement executions whose elapsed time ranges from 100 ms to 500 ms
- 500 ms–1s: number of SQL statement executions whose elapsed time ranges from 500 ms to 1s
- > 1s: number of SQL statement executions whose elapsed time is longer than 1s

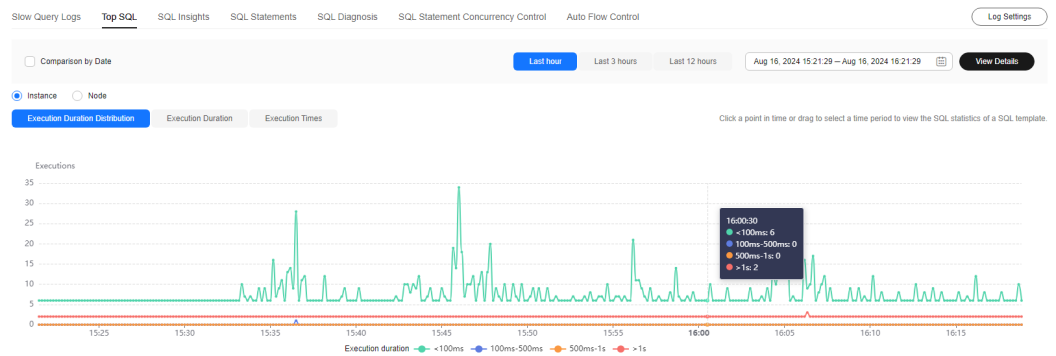
SQL statistics in the four elapsed time lengths are collected over the time range you specified.

- If you select **Last hour**, SQL statement executions are calculated every 10 seconds.
- If you select **Last 6 hours**, SQL statement executions are calculated every minute.
- If you select a time range longer than 6 hours, SQL statement executions are calculated every 5 minutes.

Step 9 Use either of the following methods to view execution duration details, such as average execution duration, total duration, average lock wait duration, and average scanned rows.

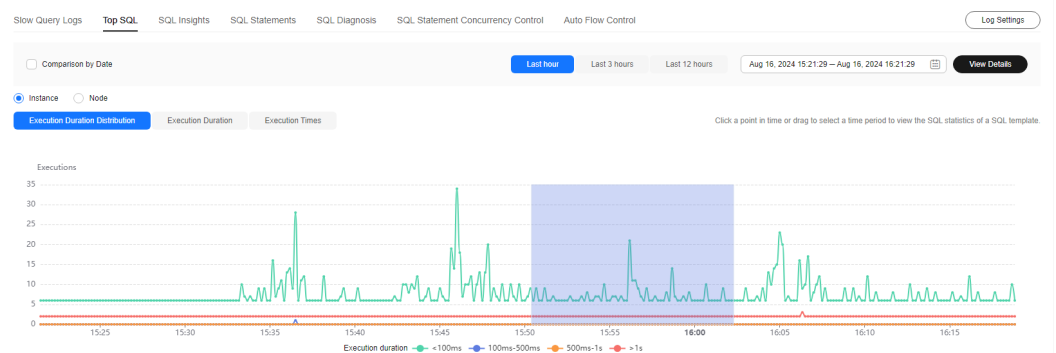
- Hover your mouse at any point in time on the graph to view top SQL statements at that time.

Figure 3-188 Viewing top SQL statements at a specific point in time



- Specify a time range using your mouse on the graph and you will see top SQL statements during that time range.

Figure 3-189 Viewing top SQL statements in a specified time range




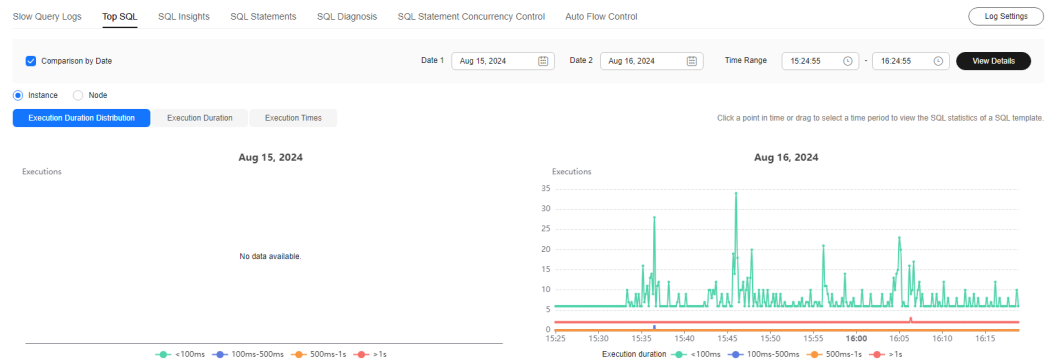
- Click  to export details about all top SQL templates in the list. This function is available only to paid instances.
- In the SQL template list, locate a SQL template and click **Details** to view the total execution times, average rows scanned, average execution duration, and the like.
- Locate a SQL template and click **Concurrency Control** in the **Operation** column to create a concurrency control rule. For details, see [SQL Statement Concurrency Control](#).
- Select **Date Comparison** in the upper left corner of the page to compare and analyze distributions of top SQL statements of the current instance in the same time range on different days.

Figure 3-190 Top SQL comparison



----End

3.15.6.3 SQL Insights

The SQL Insights module allows you to query all executed SQL statements, as well as analyze and search for the tables that are accessed and updated most frequently, and the SQL statements that have the longest lock wait, helping you quickly identify exceptions and ensuring database stability.


Usage Notes

- You need to enable **Collect All SQL Statements** before using SQL Insights. Collecting all SQL statements generates a performance loss of no more than 5%.
- After **Collect All SQL Statements** is disabled, new SQL statements will not be collected and the collected SQL statements will be deleted.
- Some data cannot be recorded if a buffer overrun occurs.
- Any SQL statement that exceeds 4096 bytes is discarded by default. This constraint can be removed by setting parameter **rds_sql_tracer_reserve_big_records** for RDS for MySQL kernel versions 5.7.33.3 or later. RDS for MySQL 5.6 and 8.0 do not support this parameter. You can set the parameter to **ON** by referring to [Modifying RDS for MySQL Instance Parameters](#), which means that SQL data records containing more than 4,096 bytes are still recorded.
- Currently, SQL Explorer takes a period of time to consume and parse raw data. Data of TOP SQL and SQL Insights tasks has a latency of about 5 minutes.
- Logs of all SQL statements executed on free instances can be retained for only one hour while those for paid instances can be retained for seven days by default and for up to 30 days as a maximum. After the retention period expires, the logs are deleted.
- This function is supported only in DAS 5.6.51.1 and later, 5.7.29.2 and later, and 8.0.20.3 and later versions.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

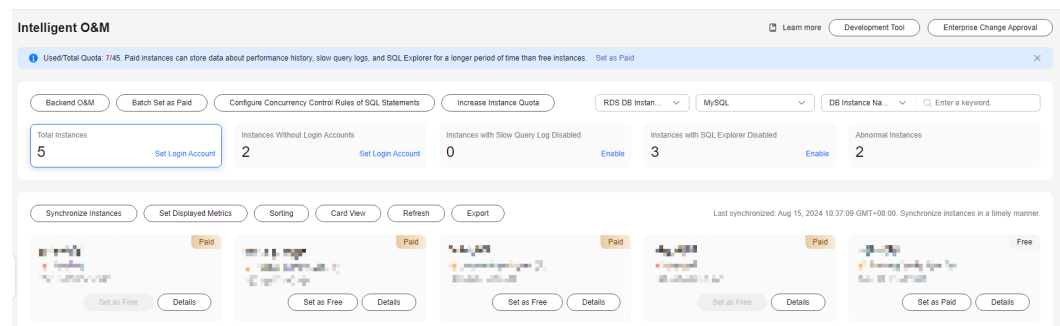
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.


Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-191 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL** > **SQL Insights**.

Toggle on  on the right of **Collect All SQL Statements**.

You can also click **Log Settings** in the upper right corner of the page to enable **Collect All SQL Statements**.

Figure 3-192 Configuring log settings

✕

Log Settings

Log Collection

1

- Enabling the Collect Slow Query Logs switch will allow the current service to store SQL statement logs for analysis.
- Collecting all SQL statements generates a performance loss of no more than 5%.
- Collected SQL data is stored for seven days by default and will be automatically deleted after this time expires.

Collect Slow Query Logs

Collect All SQL Statements

Log Storage and Archiving

* Slow Query Log Period Enter an integer from 1 to 30.

* SQL Insights Retention Period Enter an integer from 1 to 180.

Auto-Archiving Interval for Slow Query Logs Every 3 minutes

Log Size 0.04 GB
Each paid instance can use 5 GB of storage for free. Any storage used in excess of 5 GB will be billed at ¥0.0072 USD/GB per hour.

NOTE

Collect All SQL Statements takes effect once it is enabled.

If you want to disable **Collect All SQL Statements**, click **Log Settings** in the upper right corner and toggle off the switch.

Step 8 Click **Create Task**. In the displayed dialog box, specify **Time Range**, **Dimension**, and other configuration items and click **OK**.

Figure 3-193 Creating a task

Create Task
✕

* Time Range 📅

Select a time range that starts after when Collect All SQL Statements is toggled on, or the task will fail to be parsed.

* Synchronization to Other Instances
 No Yes

* Dimension
 Instance Node

Username

Keyword

Database

Thread ID

SQL Type
 SELECT INSERT UPDATE DELETE SHOW CREATE DROP ALTER REPLACE USE
 START COMMIT ROLLBACK SET TRUNCATE BEGIN

Status Successful Failed

Step 9 In the task list, view the task you created.

Figure 3-194 Viewing a task

Task ID	Start and End Time	Node ID	Status	Progress	Created	Username	Keyword	Database	Thread ID	SQL Type	Status	Operation
874	Aug 14, 2024 14:33:47 - A...	--	Parsed	100%	Aug 14, 2024 15:...	--	--	--	--	--	--	Details View Sync Tasks
873	Aug 13, 2024 18:29:02 - A...	--	Parsed	100%	Aug 13, 2024 19:...	--	--	--	--	--	--	Details View Sync Tasks

- Locate the row containing your task and click **Details** in the **Operation** column to view task details.
- Locate your task and click **View Syn Tasks** in the **Operation** column to view synchronization task details.

----End

3.15.6.4 SQL Diagnosis

This function enables you to diagnose SQL statements and obtain optimization suggestions.

CAUTION

Diagnosing a large number of SQL statements will affect performance of your instance, so you are advised to use this function on an idle instance.

Usage Notes


- This function is available only to MySQL InnoDB.

- Only SELECT, INSERT, UPDATE, and DELETE statements can be diagnosed. An INSERT statement must contain a SELECT clause.
- Currently, SQL statements of databases information_schema, test, and mysql cannot be queried.
- SQL statements that contain views cannot be diagnosed.
- SQL Diagnosis obtains table structures and data distribution information (non-original). The obtained data is only for logic diagnosis, but not stored on the DAS server.
- Obtaining table structures and data distribution information may cause additional load to your instance, but has little impact on its performance.
- SQL diagnosis history is stored on the DAS server only. If you delete SQL diagnosis history on the console, it will be also deleted from the DAS server.
- SQL formatting improves the readability of SQL statements. Formatting SQL statements enables statements to be displayed in line break mode, but does not change their logic and semantics.
- SQL formatting takes effect for all the SQL statements in the SQL window. You cannot format only one selected statement.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

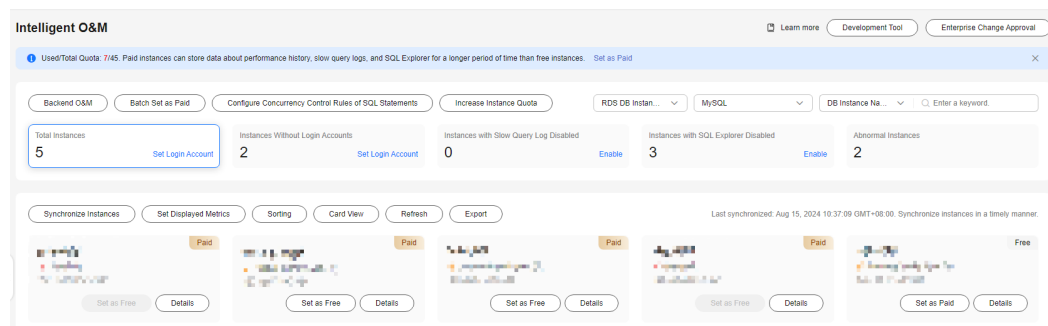
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-195 Searching for instances



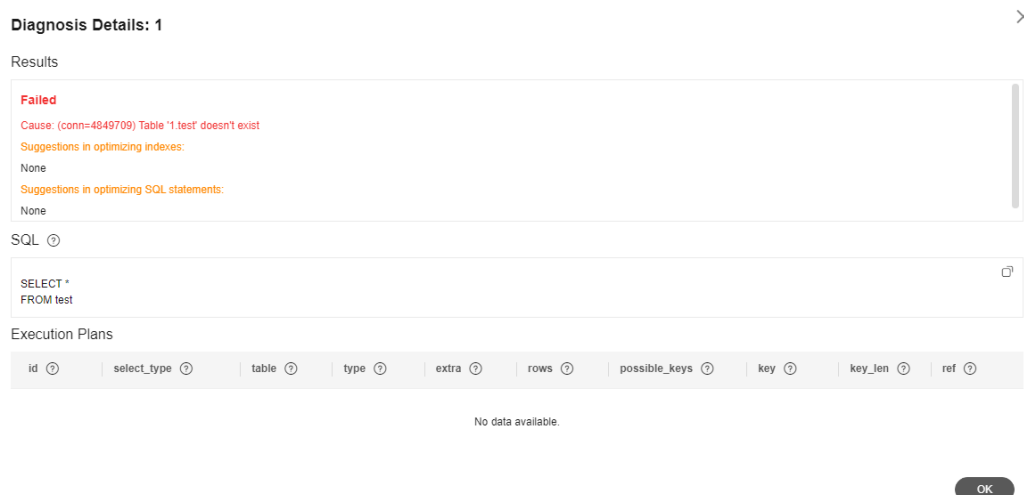
Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL** > **SQL Diagnosis**. On the displayed dialog box, perform the following operations:

- Diagnose SQL statements.

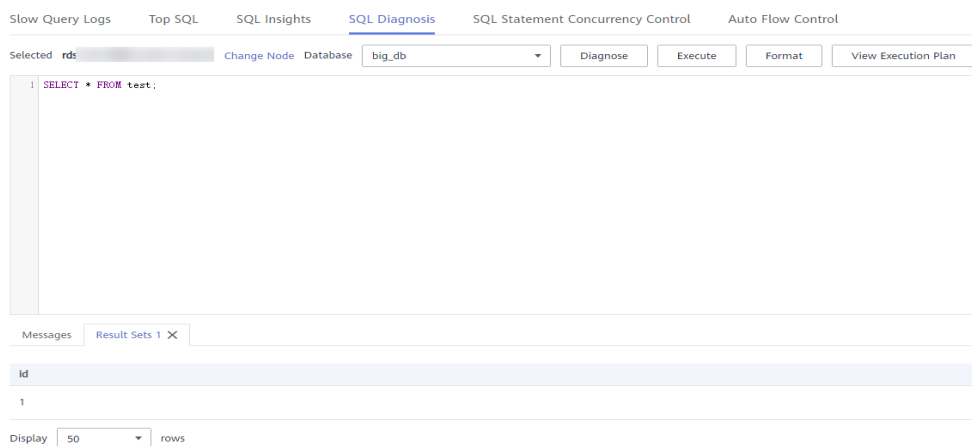
On the **SQL Diagnosis** tab page, select the database where you want to diagnose a SQL statement, enter a SQL statement, and click **Diagnose**. The diagnosis result page is displayed. You can optimize the SQL statement based on the diagnosis result.

Figure 3-196 SQL diagnosis



- Execute SQL statements.
Select a database where you want to execute a SQL statement, enter a SQL statement, and click **Execute**. The system executes the statement and displays a result set.

Figure 3-197 SQL execution result set



- Format a SQL statement.
Select the target database, enter SQL statements, and click **Format**. The system formats all the SQL statements.
- View the SQL execution plan.
Select the database where you want to view the SQL execution plan, enter SQL statements, and click **View Execution Plan**. The system executes all the SQL statements in sequence.

----End

3.15.6.5 SQL Statement Concurrency Control

Concurrency Control restricts the execution of SQL statements based on specified rules when there are SQL statements that cannot be optimized timely or a resource (for example, vCPU) bottleneck occurs.


Usage Notes

- The kernel version of primary RDS for MySQL instances must be 5.6.50.3, 5.7.31.4, 8.0.25.1, or later.
- The kernel version of RDS for MySQL read replicas must be 5.6.51.6, 5.7.37.1, 8.0.25.1, or later.
- Separate concurrency rules can be added for read replica instances of RDS for MySQL of the kernel version 5.7.38-221000 or later (5.6 and 8.0 are not supported).
- If a SQL statement matches multiple concurrency control rules, only the latest rule takes effect.
- Keywords in a concurrency control rule are sorted in a specific order, and the system will match them from first to last. For example, if one rule contains the keyword **a~and~b**, the system only matches **xxx a>1 and b>2**.
- If the replication delay is too long, adding or deleting a concurrency control rule for a read replica does not take effect immediately.
- If you replicate data from an instance to a third-party instance based on binlogs, deleting or adding SQL statement concurrency rules from or to the instance will interrupt the replication process.
- Each SQL statement concurrency control rule can contain a maximum of 128 keywords.
- Only SELECT, UPDATE, DELETE, and INSERT statements are supported for concurrency control.
- Empty characters before and after each keyword will be ignored, for example, spaces, \n, \r, and \t.
- Too many keywords or rules may affect performance. Retain only required concurrency control rules.
- Up to 100 concurrency control rules can be retained.
- If a SQL statement has been stored in query cache, it is not subject to concurrency control.
- SQL statement concurrency control does not limit concurrency for:
 - System tables
 - SQL statements used to query data, for example, **select sleep(xxx)**
 - User **root** in versions including 5.6, 5.7.41.230700 and earlier versions in 5.7, and 8.0.28.230701 and earlier versions in 8.0
 - Stored procedures, triggers, and functions

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)

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

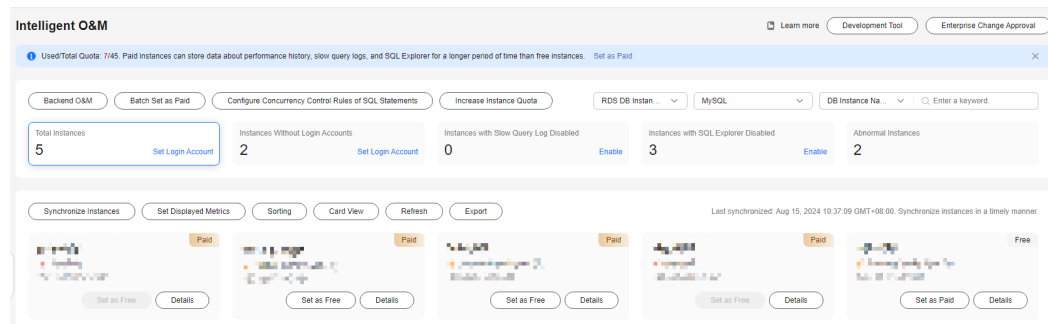
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-198 Searching for instances

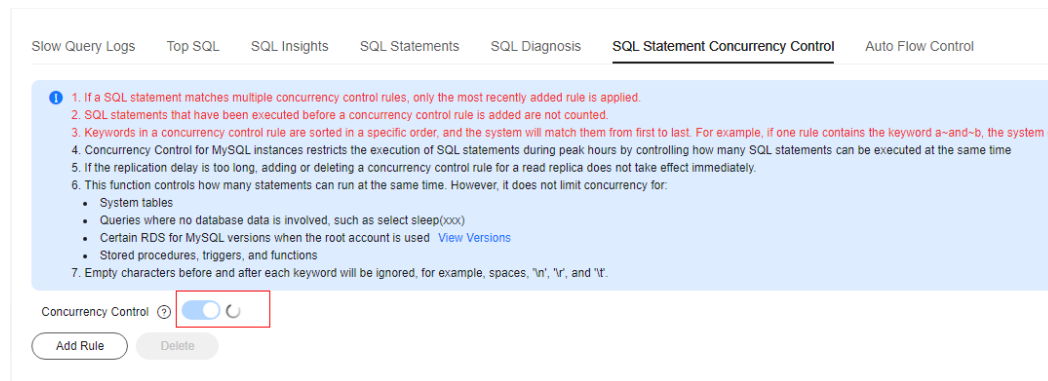


Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL > SQL Statement Concurrency Control**.

Step 8 On the displayed page, toggle on **Concurrency Control**.

Figure 3-199 Enabling SQL statement concurrency control



Step 9 In the dialog box at the top of the page, click **View Versions**.

Figure 3-200 Viewing versions

View Versions
✕

Version	Primary DB Instance	Read Replica	Rule for Read Replica
5.6	>=5.6.50.3	>=5.6.51.6	Unavailable
5.7	>=5.7.31.4	>=5.7.37.1	>=5.7.38.221000
8.0	>=8.0.25.1	>=8.0.25.1	Unavailable

This function does not work for the root account in the versions below.

⚠ Concurrency Control is used for the root user of DB instances using version 5.7.43.231000 or higher and version 8.0.28.231000 or higher. To disable this function for root users, contact customer service.

Version	Primary DB Instance
5.6	>=5.6.51.4
5.7	5.7.33.1 <= Version < 5.7.43.231000
8.0	8.0.25.1 <= Version < 8.0.28.231000

OK
Cancel

Step 10 Click **Add Rule**. In the displayed dialog box, specify **SQL Type**, **Keyword**, and **Max. Concurrency**.

Figure 3-201 Add Rule

- **Keyword:** You can enter keywords or copy an existing SQL statement to the text box and click **Generate Keyword**.

NOTE

- Keywords generated from an original SQL statement are only for reference.
- Each SQL statement concurrency control rule can contain a maximum of 128 keywords.

The following explains how a rule matches SQL statements based on keywords:

For example, if you enter the keywords

select~id~name~from~t3~where~age~>~27 (the keywords are separated by a tilde (~)) for a rule, the system will match them from first to last and restrict the execution of any SQL statement that contains these keywords.

- **Max. Concurrency:** SQL statements that meet the specified SQL type and keywords and exceed the value of **Max. Concurrency** will not be executed.

NOTE

SQL statements that have been executed before a concurrency control rule is added are not counted.

If you add a concurrency control rule and set **Max. Concurrency** to **0**, the concurrency of the following SQL statements will be controlled:

```
"select id, name from t3 where age > 27"  
"select id, name, age from t3 where age > 27"  
"select id, name from t3 where age > 5 and id < 27"
```

But the concurrency of the following SQL statement will not be controlled:

```
"select name, age from t3 where age > 27"
```

Step 11 Confirm the settings and click **OK**.

If a SQL statement concurrency control rule is no longer needed, click **Delete** in the **Operation** column.


----End


3.15.6.6 Auto Flow Control

Auto Flow Control allows you to set criteria, such as the vCPU threshold and maximum number of active connections. When the criteria are met, flow control will be automatically triggered to ensure stability of your workloads.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

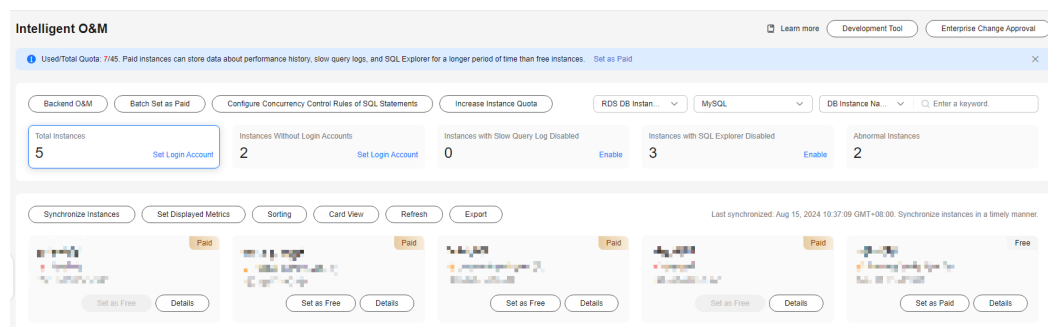
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-202 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL > Auto Flow Control**.

Figure 3-203 Auto flow control page

Started	Ended	Task	Status	Policy
Jan 22, 2024 15:05:20	Jan 22, 2024 15:05:33	Auto Flow Control	Completed	vCPU usage > 90% or Active sessions >= 2, and Duration (min) > 5
Jan 23, 2024 16:59:14	Jan 23, 2024 16:59:25	Auto Flow Control	Completed	vCPU usage > 90% or Active sessions >= 2, and Duration (min) > 5
Jan 24, 2024 15:05:06	Jan 24, 2024 15:05:18	Auto Flow Control	Completed	vCPU usage > 90% or Active sessions >= 2, and Duration (min) > 5
Jan 25, 2024 15:05:36	Jan 25, 2024 15:05:48	Auto Flow Control	Completed	vCPU usage > 90% or Active sessions >= 2, and Duration (min) > 5
Jan 26, 2024 15:05:14	Jan 26, 2024 15:05:25	Auto Flow Control	Completed	vCPU usage > 90% or Active sessions >= 2, and Duration (min) > 5
Jan 27, 2024 15:05:13	Jan 27, 2024 15:05:23	Auto Flow Control	Completed	vCPU usage > 90% or Active sessions >= 2, and Duration (min) > 5
Jan 28, 2024 15:16:04	Jan 28, 2024 15:16:21	Auto Flow Control	Completed	vCPU usage > 90% or Active sessions >= 2, and Duration (min) > 5
Jan 29, 2024 15:05:20	Jan 29, 2024 15:05:52	Auto Flow Control	Completed	vCPU usage > 90% or Active sessions >= 2, and Duration (min) > 5
Jan 30, 2024 15:05:38	Jan 30, 2024 15:05:49	Auto Flow Control	Completed	vCPU usage > 90% or Active sessions >= 2, and Duration (min) > 5
Jan 31, 2024 15:05:16	Jan 31, 2024 15:05:28	Auto Flow Control	Completed	vCPU usage > 90% or Active sessions >= 2, and Duration (min) > 5

Total Records: 50

Auto flow control is not available to free instances. To use the function, set free instances as paid instances or subscribe to **Intelligent O&M**.

Step 8 Click **Auto Flow Control**.

Step 9 In the displayed dialog box, set the control range, time, and policy and click **OK**.

Figure 3-204 Configuring auto flow control criteria

✕

Auto Flow Control

* Auto Flow Control ?

Range

Database

Ensure that the database you select is consistent with the one specified in your SQL statements, or the auto flow control rule will fail.

Username

Time

* Time Window ?

* Max. Duration Last minute Last 5 minutes Last 10 minutes Last 15 minutes

Policy

* vCPU usage (%) \geq or \geq

and Duration (min)

* Max. Active Connections

To set a custom time window for auto flow control, contact customer service to apply for required permissions. If you have obtained the permissions, you can set a time window from 00:00 to 23:59.

Figure 3-205 Time

Time

* Time Window ?

* Max. Duration Last minute Last 5 minutes Last 10 minutes Last 15 minutes

Step 10 After auto flow control is enabled, determine whether to kill sessions based on service requirements. For details, see [Real-Time Sessions](#).

----End

3.15.7 Locks and Transactions

3.15.7.1 InnoDB Locks

InnoDB lock waits generated before DML operations are displayed in real time. You can quickly locate the session waits and blocks that happened when multiple sessions update the same piece of data at the same time, and can terminate the source session that holds locks to restore blocked operations.


NOTE

InnoDB Locks does not support DDL locks, also called metadata locks (MDLs). You view and analyze them on the **Metadata Locks** page.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

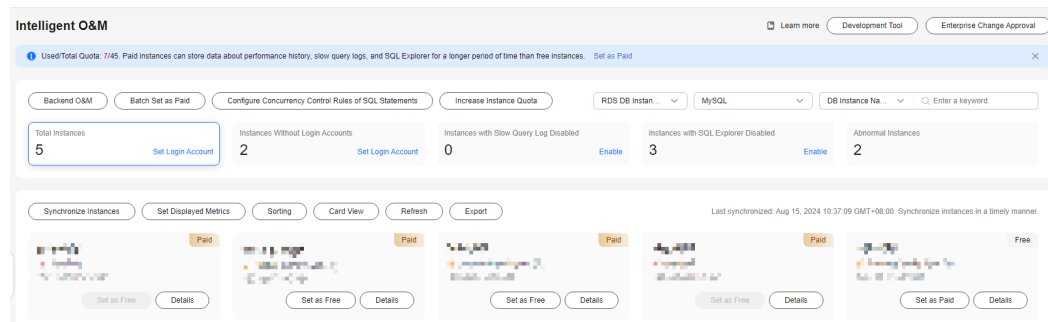
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-206 Searching for instances



Step 6 Locate the box containing your target instance and click **Details**.

Step 7 Choose **Locks and Transactions** > **InnoDB Locks** to check whether there are lock waits.

----End

3.15.7.2 Metadata Locks

Metadata locks (MDLs) are used to ensure consistency between DDL and DML operations. Executing DDL statements on a table generates metadata write locks.

If there is a metadata lock, all subsequent SELECT, DML, and DDL operations on the table will be blocked, causing a connection backlog.

Metadata locks are displayed in real time. You can quickly identify problems and terminate the sessions with metadata locks to restore blocked operations.


Precautions

- DML locks are not included. You can view and analyze them on the **InnoDB Locks** page.
- Metadata locks are used only in MySQL 5.6 and 5.7.
- A maximum of 1,000 records can be displayed.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

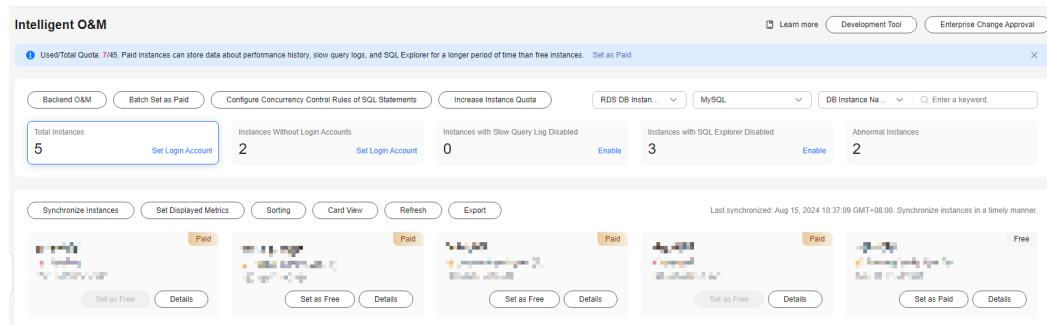
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-207 Searching for instances



Step 6 Locate the box containing your target instance and click **Details**.

Step 7 Choose **Locks and Transactions > Metadata Locks**.

Step 8 Select a lock status and type, enter a database name, table name, and session ID as needed, and click **Query**.

Step 9 In the query result, check whether there are sessions that hold MDL locks. If yes, select the sessions as required and click **Kill**.

----End

3.15.8 Storage Analysis


Storage occupied by data and logs and historical changes of storage usage are important for database performance. The **Storage Analysis** page displays storage

overview and disk space distribution of your instance. In addition, DAS can estimate the available days of your storage based on historical data and intelligent algorithms, so that you can scale up storage in a timely manner. **Auto Scale**, **Tablespaces**, **Top 50 Databases**, and **Top 50 Tables** are also available on this page.

Viewing Storage Space Usage

Step 1 [Log in to the Huawei Cloud console](#).

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

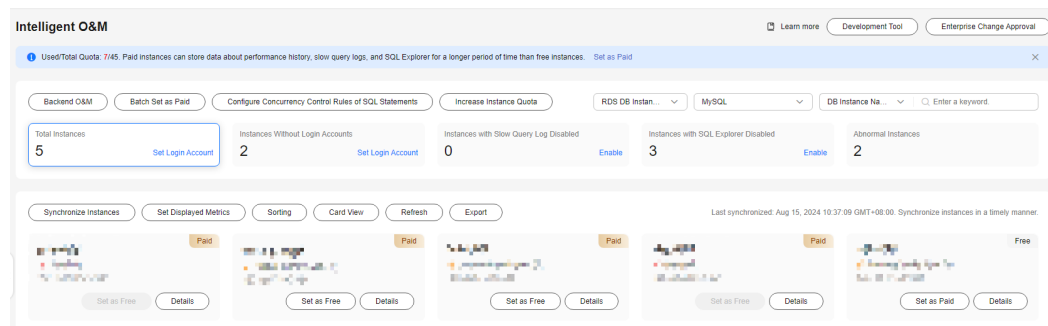
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

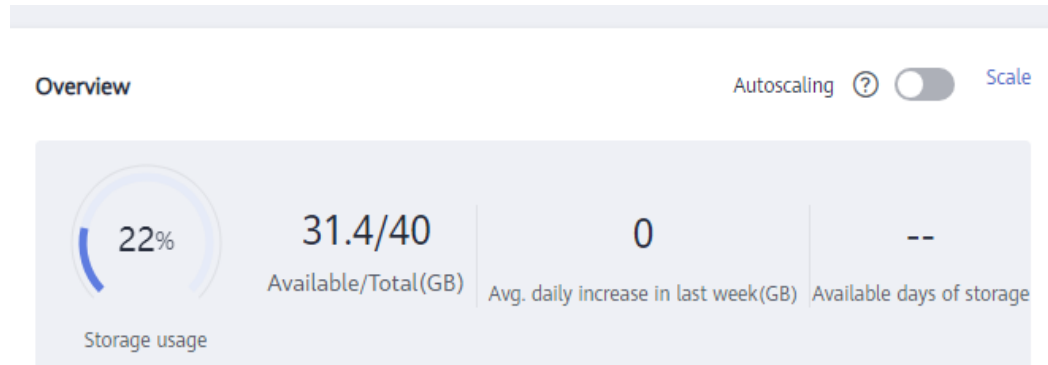
Figure 3-208 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 Choose **Storage Analysis**. In the **Overview** area, view the space usage.

Figure 3-209 Overview



- The following information is displayed:

- Storage usage
- Available and total storage
- Average daily increase in last week
- Available days of storage

NOTE

If the average daily increase in last week is 0 GB, the estimated available days of storage are unlimited and are not displayed.

- If the space is insufficient, click **Scale** in the upper right corner.
- You can also enable **Autoscaling**. If available storage drops to or below 10 GB or 10%, total storage will automatically be scaled up by 15%. If the increased storage is not a multiple of 10 GB, the system rounds it up to the nearest multiple of 10. If your account balance is insufficient, autoscaling will fail.

NOTE

Autoscaling is not available to free instances. To use the function, set free instances as paid instances or subscribe to **Intelligent O&M**.

----End

Tablespaces

This function helps you diagnose exceptions of tables, for example, counting tables with abnormal tablespace growth, tables without primary keys, and tables without indexes.

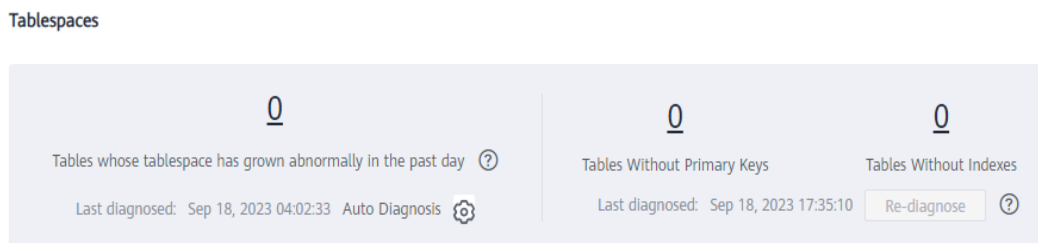
Both automatic diagnosis and manual diagnosis are supported.

NOTE

- Tablespaces function is not available to free instances. To use the function, set free instances as paid instances or subscribe to **Intelligent O&M**.
- If the number of tables exceeds 5,000, manual diagnosis cannot be used.
- If the CPU usage exceeds 90%, manual diagnosis cannot be used.
- Tables in the **Top 50 Tables** are automatically diagnosed. Scope for manual table diagnosis is not limited.

In the **Tablespaces** area, you can view tablespace diagnosis information.


Figure 3-210 Tablespaces



- **Auto Diagnosis**

The system automatically diagnoses tables at about 04:00 every day.

In the left part of the **Tablespaces** area, you can view tables whose tablespace has grown abnormally in the past day. You can click the number to view the diagnosis details.

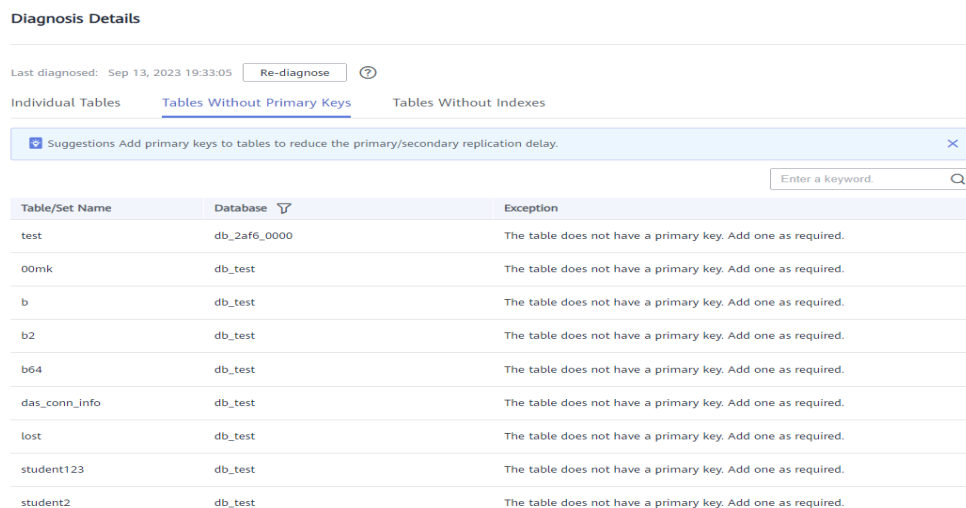
Any table whose tablespace has grown by more than 10,240 MB in the past day is counted. You can also click  on the right of **Auto Diagnosis** to set the upper limit for daily tablespace increase.

- **Manual Diagnosis**

Click **Re-diagnose** to manually trigger a diagnosis task. This operation can only be performed once every 5 minutes.

After the diagnosis is successful, you can view the number of tables without primary keys and indexes. You can click a number to view the diagnosis details.

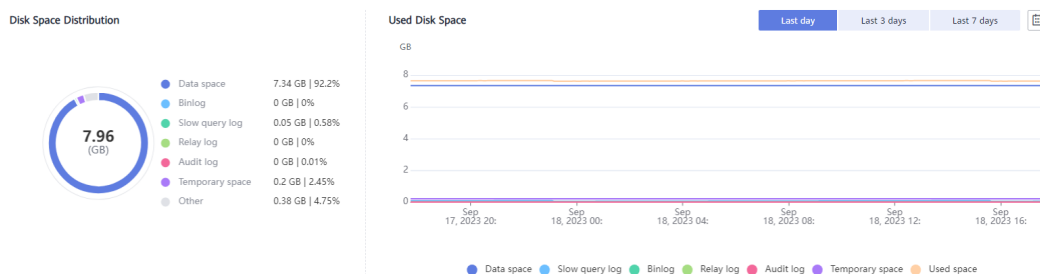
Figure 3-211 Viewing diagnosis details



Viewing Disk Space Distribution

You can view the distribution and change trend of the storage space.

Figure 3-212 Viewing disk space distribution



 **NOTE**

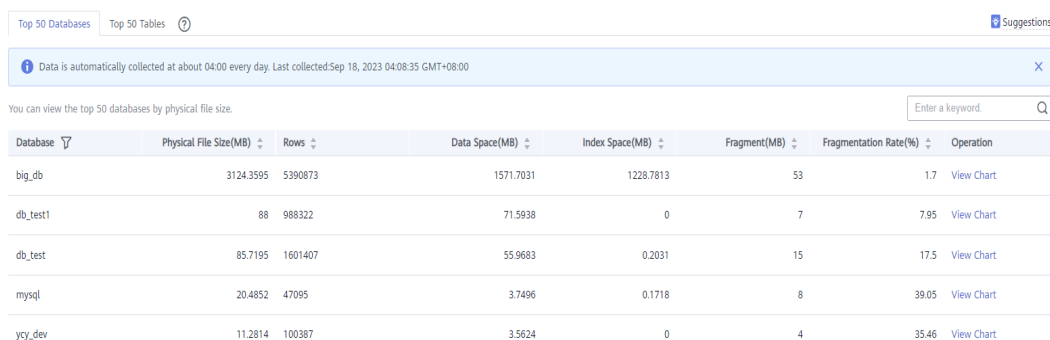
If the total number of files in your disk space (including data space, binlog space, slow query log space, relay log space, audit log space, temporary space, and other space) exceeds 10,000, information about the files or display disk space distribution and usages over time will not be collected on the console. This prevents performance slowdowns caused by collecting statistics on too many files. If this happens, contact technical support.

- **Data space:** Disk space occupied by user data
- **Binlog:** Disk space occupied by binlogs
- **Slow query log:** Disk space occupied by slow logs
- **Relay log:** Disk space occupied by relay logs
- **Audit log:** Disk space occupied by audit logs
- **Temporary space:** Disk space occupied by temporary files
- **Other:** Disk space reserved by the operating system for system users. About 5% of the disk space is reserved in Linux.

Top Databases and Tables by Physical File Size

You can view the top 50 databases and tables by physical file size and identify the databases and tables with high usage based on storage space distribution.

Figure 3-213 Viewing top 50 databases and tables

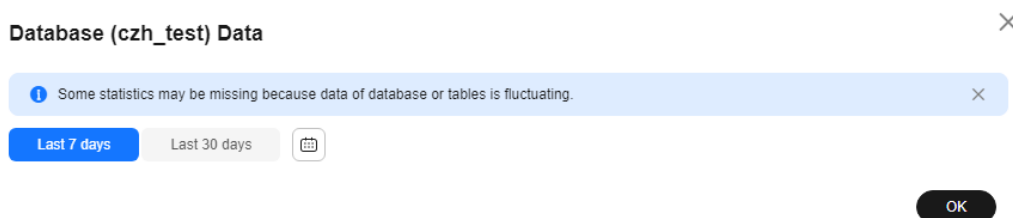


The screenshot shows a web interface for viewing top 50 databases. At the top, there are tabs for 'Top 50 Databases' and 'Top 50 Tables'. A notification bar states: 'Data is automatically collected at about 04:00 every day. Last collected Sep 18, 2023 04:08:35 GMT+08:00'. Below this, a search bar is present with the text 'Enter a keyword'. The main content is a table with the following columns: Database, Physical File Size(MB), Rows, Data Space(MB), Index Space(MB), Fragment(MB), Fragmentation Rate(%), and Operation. The table lists five databases: big_db, db_test1, db_test, mysql, and ycy_dev.

Database	Physical File Size(MB)	Rows	Data Space(MB)	Index Space(MB)	Fragment(MB)	Fragmentation Rate(%)	Operation
big_db	3124.3595	5390873	1571.7031	1228.7813	53	1.7	View Chart
db_test1	88	988322	71.5938	0	7	7.95	View Chart
db_test	85.7195	1601407	55.9683	0.2031	15	17.5	View Chart
mysql	20.4852	47095	3.7496	0.1718	8	39.05	View Chart
ycy_dev	11.2814	100387	3.5624	0	4	35.46	View Chart

Click **View Chart** to view data volume changes in the last 7 days, last 30 days, or a custom time period (spanning no more than 30 days).

Figure 3-214 Viewing a trend chart



The screenshot shows a modal window titled 'Database (czh_test) Data'. At the top right is a close button (X). Below the title is a notification bar: 'Some statistics may be missing because data of database or tables is fluctuating.' Below the notification are two buttons: 'Last 7 days' (highlighted in blue) and 'Last 30 days'. To the right of these buttons is a calendar icon. At the bottom right is an 'OK' button.

NOTE

- DAS collects data at about 04:00 every day.
- Physical file sizes are precisely recorded, but other fields' values are estimated. If there is a large gap between a file size and another field, run `ANALYZE TABLE` on the table.
- A database or table whose name contains special characters, including slashes (/) and #p#, is not counted.
- Top databases and tables are available only in RDS for MySQL 5.7 and 8.0.
- If there are more than 50,000 tables in your instance, to prevent data collection from affecting the instance performance, top databases and tables will not be counted.
- Some statistics may be missing because data of database or tables is fluctuating.


3.15.9 Daily Reports

The **Daily Reports** page provides overall information about your instance status of the previous day, including Slow Query Logs, SQL Explorer, performance, and disk analysis. You can download and subscribe to analysis reports. A daily diagnosis is recommended.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

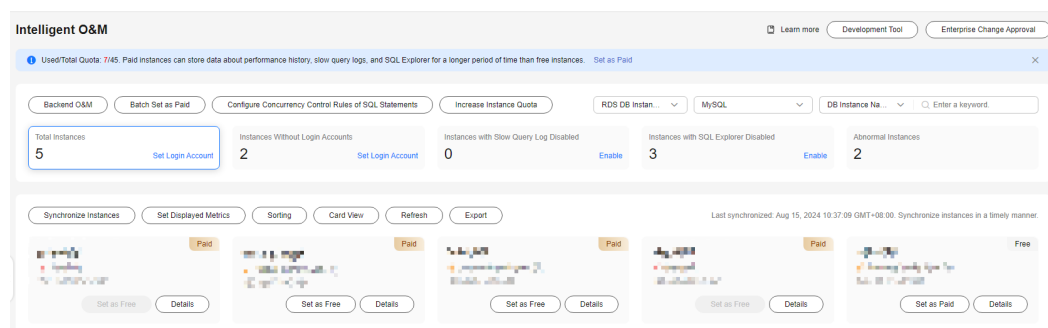
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

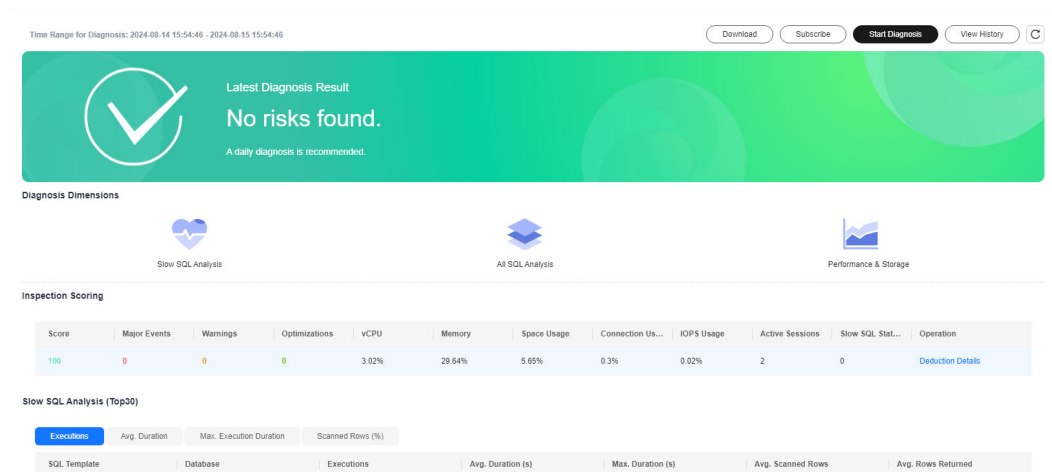
Figure 3-215 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 On the displayed page, choose **Daily Reports**.

Figure 3-216 Daily reports



You can perform the following operations:

- Click **Download** to download a diagnosis report to your local PC.
- Click **Subscribe** to the subscribe to daily reports. After you subscribe to daily reports, your account will be emailed when risks are identified.

Figure 3-217 Subscribing to daily reports

Subscribe to Daily Report

★ Subscription

By topic

By email

★ Topics

--Select--

Notification messages are billed as SMN resources. For details, see [Billing](#).

After you subscribe to Daily Reports, you will be emailed when risks are identified.

Cancel

OK

NOTE

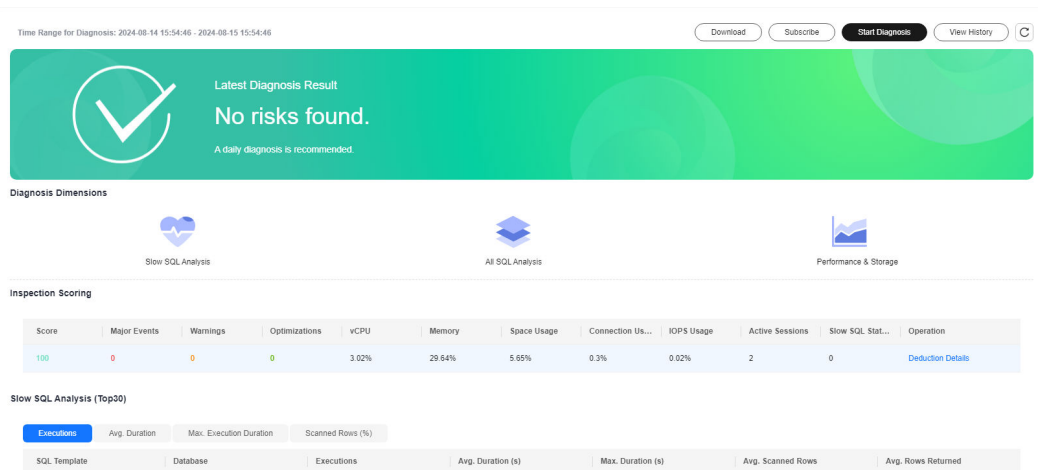
Before subscribing to diagnosis reports, note that:

- The subscription function depends on the Simple Message Notification (SMN) service.
- You can subscribe to daily reports **by topic** or **by email**.

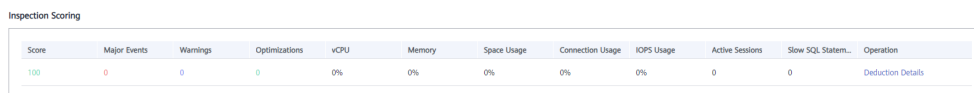
A topic is used to publish messages and subscribe to notifications. If you select **by topic** and the required topic is unavailable, create one first and subscribe to the topic. For details, see [Creating a Topic](#) and [Adding a Subscription](#). Only emails are available for subscribing to topics.

If you select **by email**, you can enter up to 15 email addresses. Separate email addresses with a semicolon (;).

- After you subscribe to daily reports, diagnosis reports will be emailed to you after you manually diagnose your instance and the result is abnormal.
- Click **Start Diagnosis** to diagnose the current instance. After the diagnosis is complete, view the diagnosis result.

Figure 3-218 Viewing diagnosis results

In the **Inspection Scoring** area, you can view the inspection score and details of the current instance. For more information about inspection scoring, see [Inspection Score](#).

Figure 3-219 Viewing inspection scoring results

In the **Slow SQL Analysis** area, you can view the analysis result of slow query logs of the current instance.

Figure 3-220 Slow SQL analysis

Slow SQL Analysis (Top30)

Executions	Avg. Duration	Max. Execution Duration	Scanned Rows (%)		
SQL Template	Executions	Avg. Duration (s)	Max. Duration (s)	Avg. Scanned Rows	Avg. Rows Returned
SELECT sleep(?);	34547	1.00	1.37	0	1
UPDATE student2 S...	21078	1.00	1.94	1	0
select * from test_tb...	17272	0.67	1.07	1000000	1000000
DELETE FROM stud...	4320	1.86	2.01	1	0
select count(1) fro...	2177	0.08	0.14	1000000	1
SELECT count(*) AS ...	6	0.70	0.76	100000	1

In the **All SQL Analysis** area, you can view analysis of all SQL statements of the current instance.

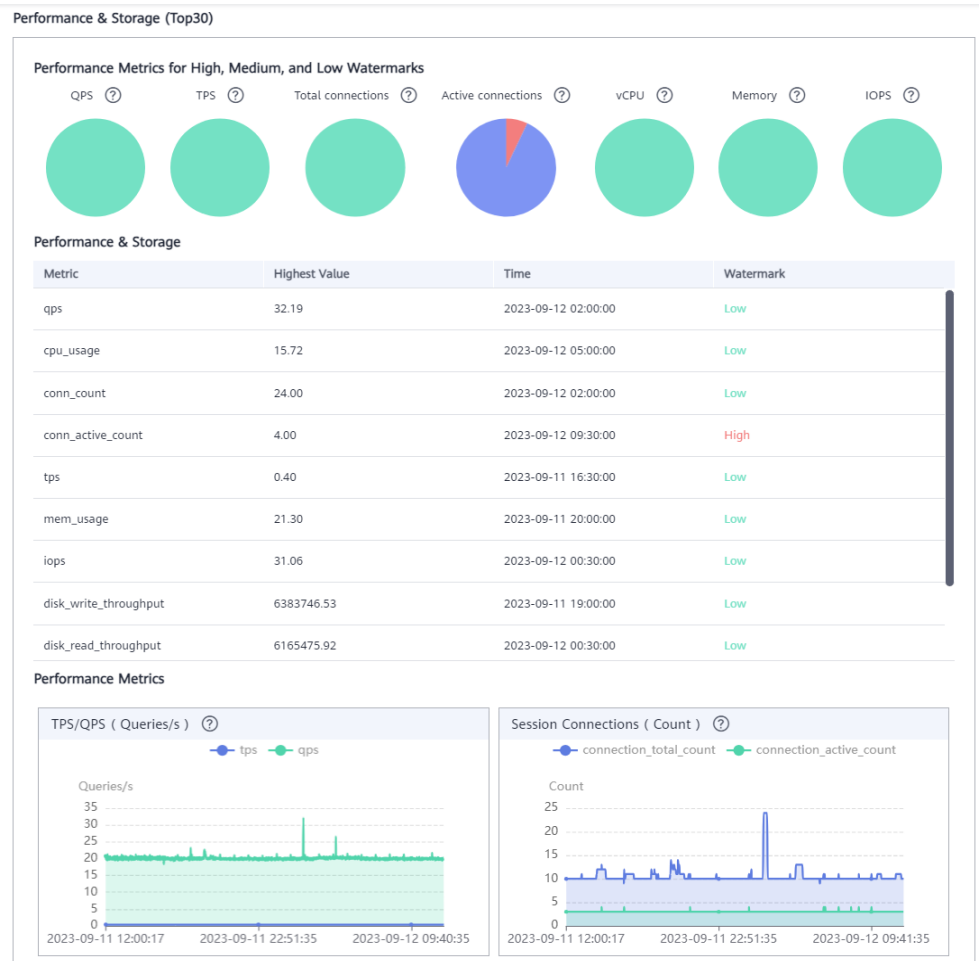
Figure 3-221 All SQL analysis

All SQL Analysis (Top30)

Total Scanned Rows	Total Executions	Avg. Elapsed Time		
SQL Template	Total Executions	Avg. Elapsed Time	Avg. Rows Scanned	Total Scanned Rows
SELECT count(*) AS count...	6	696ms	100K	600K
SHOW GLOBAL STATUS L...	156	0.24ms	848	132.29K
SHOW COLLATION	558	0ms	222	123.88K
UPDATE student2 SET id ...	20866	1s	0.98	20.37K
SELECT count(1) AS table...	31	5.48ms	327	10.14K
SHOW TABLES LIKE ?	5576	0ms	1	5.58K
DELETE FROM student2 ...	4193	1.86s	1	4.19K
SELECT it.*, ic.character_s...	26	0.11ms	87.62	2.28K
SHOW PROCEDURE STAT...	39	0.54ms	38	1.48K

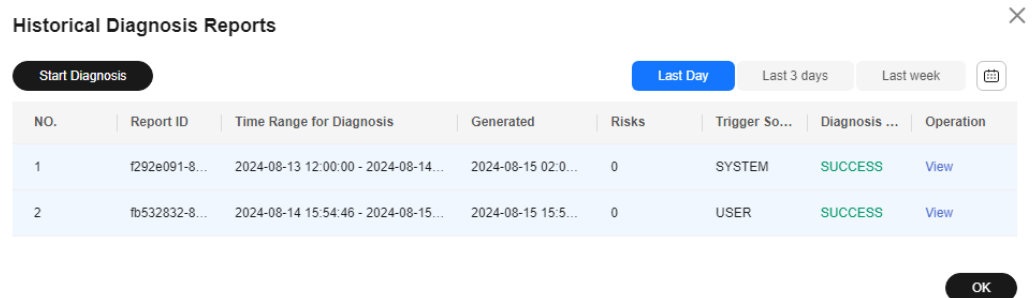
In the **Performance & Storage** area, you can view performance metrics for high, medium, and low watermarks and the trend chart.

Figure 3-222 Performance and storage analysis



- Click **View History** to view historical reports.

Figure 3-223 Viewing diagnosis history



----End

3.15.10 Inspection Score

3.15.10.1 Inspection Score

DAS can score DB instances. You can manually start an inspection to stay ahead of your DB instance health within a specified period.

This section describes how to score the health of instances on the DAS console.

Usage Notes

- Only RDS for MySQL instances support this function.
- For details about the scoring rules supported by DAS, see [Scoring Rules](#).


Prerequisites

An RDS for MySQL instance has been logged in to and is running normally.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

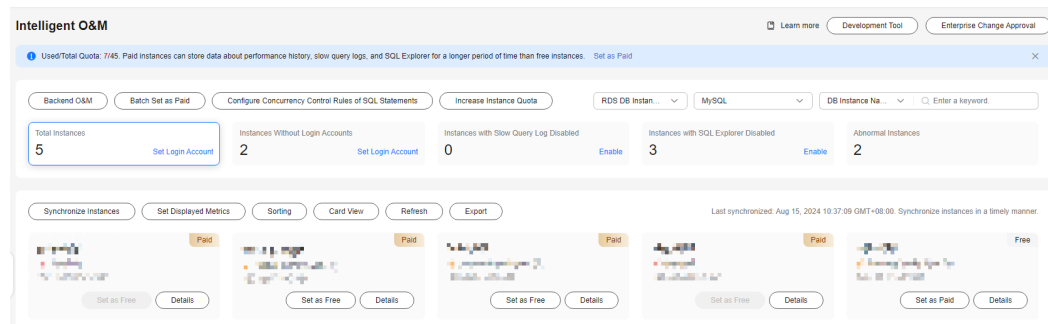
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

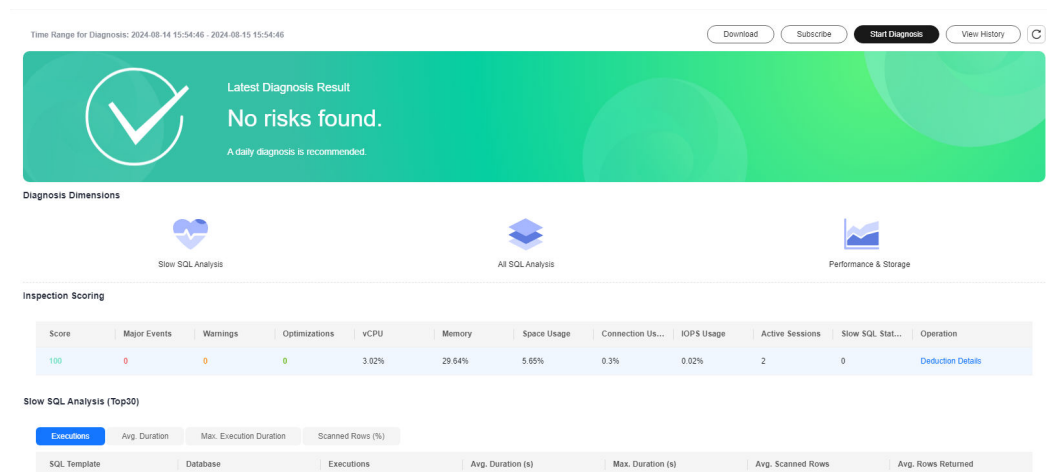
Figure 3-224 Searching for instances



Step 6 Select the instance whose health you want to score and click **Details**.

Step 7 On the top menu bar, choose **Daily Reports**.

Figure 3-225 Daily reports page



Step 8 Click **Start Diagnosis** in the upper right corner of the page and specify **Time Range for Diagnosis**. The time range cannot exceed one day.

Figure 3-226 Selecting a time range



Step 9 Click **OK**.

Step 10 After the diagnosis is complete, view the inspection score in the **Inspection Scoring** area.

Figure 3-227 Viewing the scoring result



You can also click **Deducted Points** in the **Operation** column to view score deduction items and the deducted points.

Figure 3-228 Viewing deduction details

Item	Value	Deducted Points	Severity	Formula
Memory	29.64%	0	--	--
vCPU	3.02%	0	--	--
Space Usage	5.65%	0	--	--
IOPS Usage	0.02%	0	--	--
Connection Usage	0.3%	0	--	--
Active Sessions	2	0	--	--
Slow SQL Statem...	0	0	--	--

View Scoring Rules

OK

----End

3.15.10.2 Scoring Rules

This section describes inspection scoring rules.

Points are deducted based on scoring rules. You can view scores on the console. For details, see [Inspection Score](#).

Scoring Rules

Table 3-23 Scoring rules of RDS for MySQL instances

Score Deduction Item	Description	Sub-item	Condition	Score Calculation Rule
Memory usage	Average memory usage per day	Major event	Memory > 90%	$\min[3 + (\text{Memory} - 0.9) \times 50, 10]$
		Warning	$80\% \leq \text{Memory} \leq 90\%$	$1 + (\text{Memory usage} - 0.8) \times 20$

Score Deduction Item	Description	Sub-item	Condition	Score Calculation Rule
CPU usage	Average CPU usage per day NOTE Multi-core CPUs need to be converted to single-core CPUs for calculation.	Major event	CPU usage \geq 80%	$\min[3 + (\text{CPU usage} - 0.8) \times 30, 10]$
		Warning	$70\% \leq \text{CPU usage} \leq 80\%$	$1 + (\text{CPU usage} - 0.7) \times 20$
Space usage	(Average used space/Total space) \times 100%	Major event	Space usage $>$ 90%	$\min[3 + (\text{Space usage} - 0.9) \times 40, 10]$
		Warning	$70\% \leq \text{Space usage} \leq 90\%$	$1 + (\text{Space usage} - 0.7) \times 20$
Connection usage	Average connections per day/ Maximum of connections allowed in a day	Major event	Connection usage $>$ 80%	3
		Warning	$70\% \leq$ Connection rate $\leq 80\%$	1
IOPS usage	(Average IOPS per day/ Maximum of IOPS allowed) \times 100%	Major event	IOPS usage $>$ 90%	5
		Warning	$70\% <$ IOPS usage $<$ 90%	3
Active sessions	Active sessions generated in a day	Major event	Active sessions $>$ $\min(4 \times \text{CPU cores} + 8, 96)$	9
		Warning	Active sessions $>$ $\min(2 \times \text{CPU cores} + 8, 64)$	3
Slow SQL statements	Slow SQL statements executed per day	Major event	slowSqlCount ≥ 500	$18 + (\text{slowSqlCount} - 10) / 30$
		Warning	$100 \leq$ Slow SQL statements $<$ 500	$4 + (\text{Slow SQL statements} - 100) / 30$

Score Deduction Item	Description	Sub-item	Condition	Score Calculation Rule
		Optimization	0 < Slow SQL statements < 100	1 + (Slow SQL statements - 10)/30

3.15.11 Managing Anomaly Snapshots

Scenarios

This function intelligently detects instance anomalies and records information about session, lock, and transaction snapshots to facilitate subsequent fault locating.


Constraints

- To use this function, contact customer service to apply for required permissions.
- Enabling anomaly collection will cause about 5% of instance performance loss.
- For an HA read replica with anomaly snapshots enabled, if the primary read replica node fails and workloads are automatically switched over to the standby read replica node, anomaly snapshots will not be enabled for the new primary read replica node.
- Each anomaly snapshot can be retained for a maximum of seven days. A maximum of 10 anomaly snapshots can be retained for each node at the same time.
- Anomaly snapshots record long-running transactions.

Enabling Anomaly Collection

Step 1 [Log in to the Huawei Cloud console.](#)

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

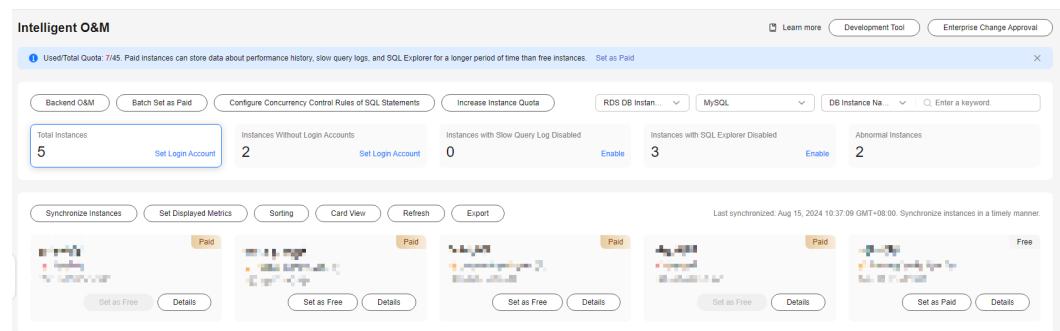
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-229 Searching for instances

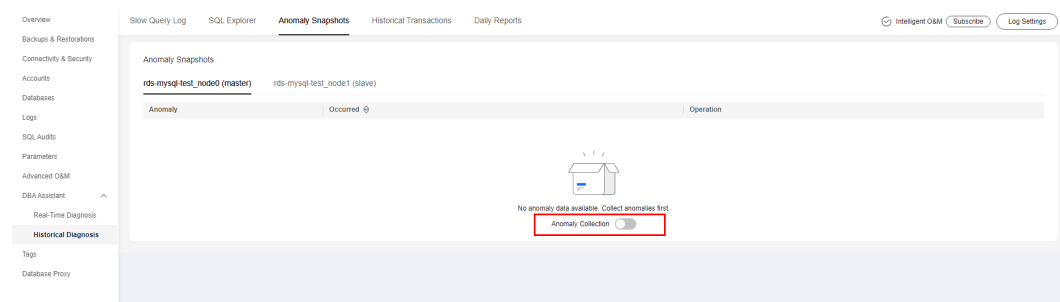


Step 6 Locate the target instance and click **Details**.

Step 7 Click the **Anomaly Snapshots** tab.

Step 8 On the displayed page, toggle on the **Anomaly Collection** switch.

Figure 3-230 Anomaly Snapshots



----End

Viewing Anomaly Snapshots

Step 1 Click the **Anomaly Snapshots** tab.

Step 2 On the displayed page, view session snapshots, metadata lock snapshots, InnoDB lock snapshots, and transaction snapshots of the DB instance.

- To view anomaly causes, click **Diagnosis Details** in the **Operation** column.
- To view details about slow SQL statements, click **Slow SQL** in the **Operation** column.

----End

3.16 Intelligent O&M (Old Version)

3.16.1 Setting an Instance as Paid

Intelligent O&M is available for paid and free instances. Paid instances can enjoy more value-added functions.

For details about instance billing policies, see [Intelligent O&M Billing](#).

If you want to set an instance as paid, go to [Setting an Instance as Paid](#).


If you want to set more than one instance as paid, go to [Setting Instances as Paid](#).

If you want to set your instances as free instances, see [Setting a Paid Instance as Free](#).

Setting an Instance as Paid

Step 1 [Log in to the Huawei Cloud console](#).

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

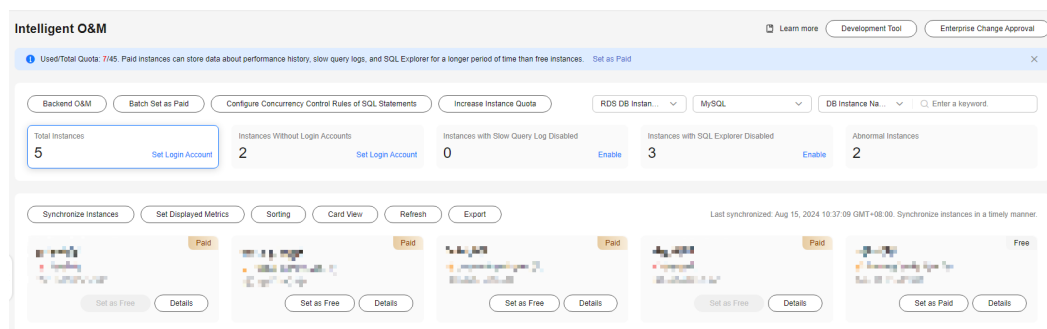
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-231 Searching for instances



Step 6 Select the instance that you want to set as paid and click **Set as Paid**.

Step 7 Carefully read the information displayed in the dialog box and click **OK**.


Step 8 On the **Instance List** page, check whether the instance status changes to **Paid**.

----End

Setting Instances as Paid

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

- Step 5** On the displayed page, click **Batch Set as Paid** or **Set as Paid**.
- Step 6** Carefully read the information displayed in the dialog box, select the instances that you want to set as paid, and click **OK**.
- Step 7** On the **Instance List** page, check whether the instance status changes to **Paid**.
- End

Setting a Paid Instance as Free



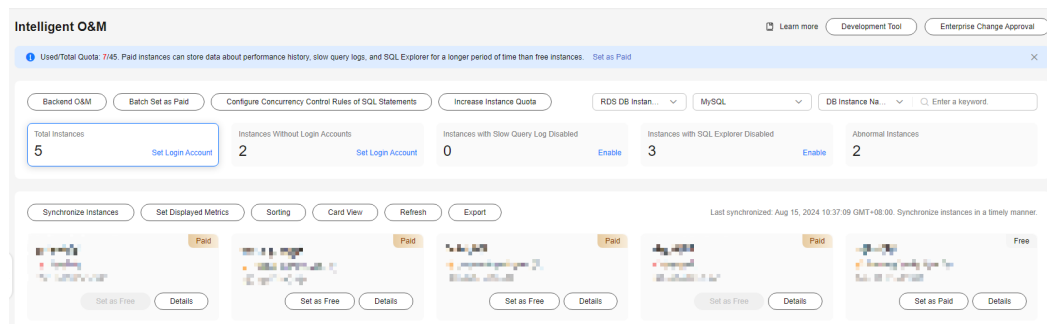
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M** > **Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-232 Searching for instances



- Step 6** Locate the instance that you want to set as free and click **Set as Free** on the **Instance Overview** page.
- Step 7** Carefully read the information displayed in the dialog box and click **OK**.
- If an instance is set as paid, you have to wait 5 minutes before it can be changed back to free.
 - On the **Instance List** page, check whether the instance status changes to **Free**.
- End

3.16.2 Performance


3.16.2.1 Performance History

This section describes how to use the performance history function to view the running status of an instance in a specified period.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

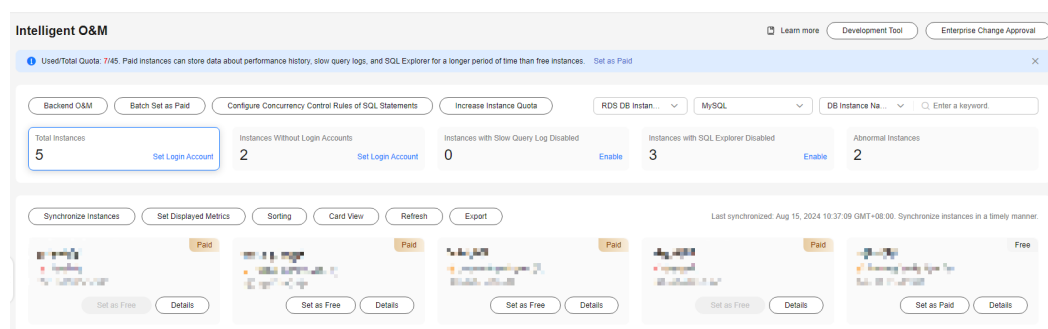
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-233 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 In the upper right corner of the page, click **Go to Old Edition**.

Step 8 Choose **Performance** > **Performance History**.

- Click **Select Node** to select the node whose performance history you want to view.
- Click **Select Metric**, select the metrics to display, and click **OK**.
Set a time range in the upper right corner so that you can view the node performance during this period. You can also click **Detail** on each metric performance graph to set a time range.
- Enable **Interactive Graph** to view other metrics at the same time.

----End

3.16.2.2 Real-Time Performance

The **Real-Time Performance** tab displays key metrics of your instance and allows you to compare performance of your instance by date, helping you keep track of changes of your periodic services and metrics and detect exceptions.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)



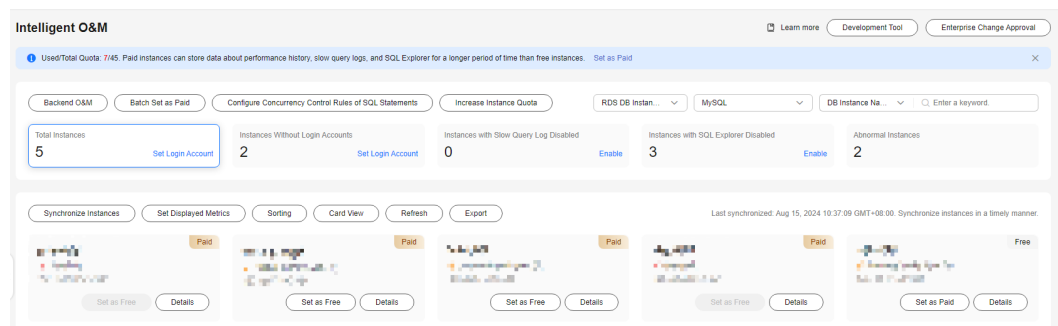
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M** > **Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-234 Searching for instances



- Step 6** Locate the target instance and click **Details**.
- Step 7** In the upper right corner of the page, click **Go to Old Edition**.
- Step 8** Choose **Performance** > **Real-Time Performance**.
 - View the server uptime, connection information, and buffer pool information.
 - Click **Set Metric**, select the metrics to display, and click **OK**.

Table 3-24 Real-time performance metrics

Metric	Description
Slow Sessions	Number of new slow sessions
QPS TPS	QPS: SQL statements executed per second TPS: transactions executed per second
Connections	Total: enabled connections Active: active connections
DML Executions	select: SELECT statements executed per second insert: INSERT statements executed per second update: UPDATE statements executed per second delete: DELETE statements executed per second insert_select: INSERT statements executed per second

Metric	Description
InnoDB Cache	Cache Hit Ratio: cache hit ratio Cache Usage: cache usage
InnoDB Accessed Rows	rows_read: rows read from an InnoDB storage engine table rows_inserted: rows inserted into an InnoDB storage engine table rows_updated: rows written from an InnoDB storage engine table rows_deleted: rows deleted from an InnoDB storage engine table
Logical Reads Physical Reads	Logic Reads: logical reads per second Physical Reads: physical reads per second
InnoDB Average Row Lock Duration (ms)	Average lock time (ms) of InnoDB row locks
InnoDB Row Lock Waits	Average InnoDB Row Lock Waits: average waits of InnoDB row locks Total lock waits: total lock waits
Temporary Tables Files	Temporary tables: temporary tables automatically created when SQL statements are executed Temporary files: temporary files automatically created when SQL statements are executed
Network Traffic	Total: total incoming and outgoing traffic of an instance Incoming: incoming traffic of an instance Outgoing: outgoing traffic of an instance

- Adjust the time interval of collecting metrics. The interval ranges from 1 to 10 seconds.
- Pause or start the real-time performance function based on service requirements.

----End

3.16.2.3 Real-Time Diagnosis

DAS allows you to use the real-time diagnosis function to view overall performance of your instance and identify exceptions quickly.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)



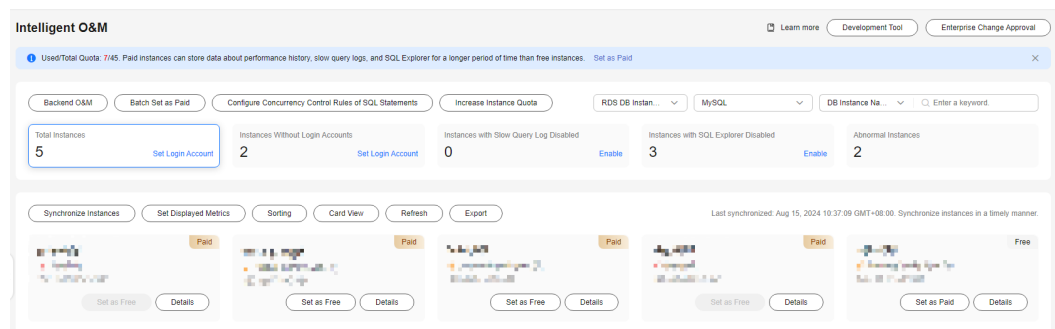
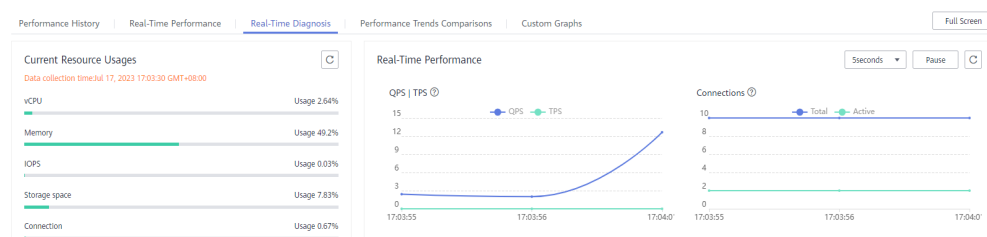
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M** > **Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-235 Searching for instances



- Step 6** Locate the target instance and click **Details**.
- Step 7** In the upper right corner of the page, click **Go to Old Edition**.
- Step 8** Choose **Performance** > **Real-Time Diagnosis**.
- Step 9** View CPU, memory, IOPS, storage space, and connection usages of your instance.

Figure 3-236 Viewing resource usages



----End

3.16.2.4 Performance Trends Comparisons

DAS allows you to use the performance trends comparison function to view performance trends of your instance within the same time range on different days for comparison and analysis.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).



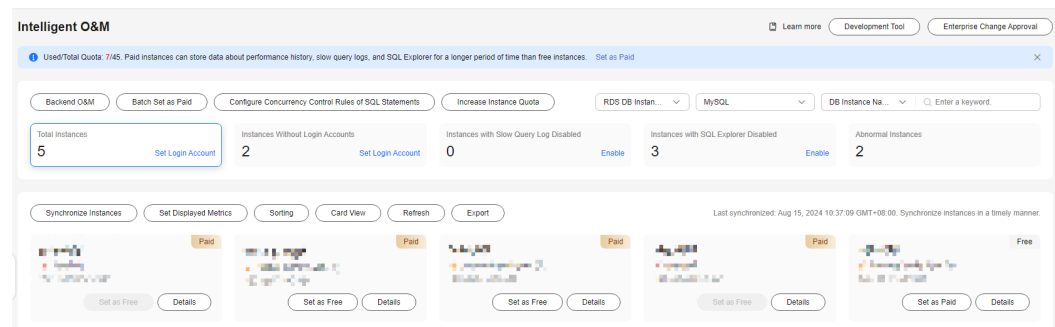
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-237 Searching for instances





- Step 6** Locate the target instance and click **Details**.
- Step 7** In the upper right corner of the page, click **Go to Old Edition**.
- Step 8** Choose **Performance > Performance Trends Comparisons**.
- Select a node whose performance trends you want to view.
 - Click **Select Metric**, select the metrics to display, and click **OK**.
Performance history graphs of the metrics you selected are displayed. Select the same time range on different days to view the graphs. You can also click **Detail** on each metric performance graph to set a time range.
 - Enable **Interactive Graph** to view other metrics at the same time.
- End

3.16.2.5 Custom Graphs

This section describes how to create custom graphs based on your service requirements on the DAS console.

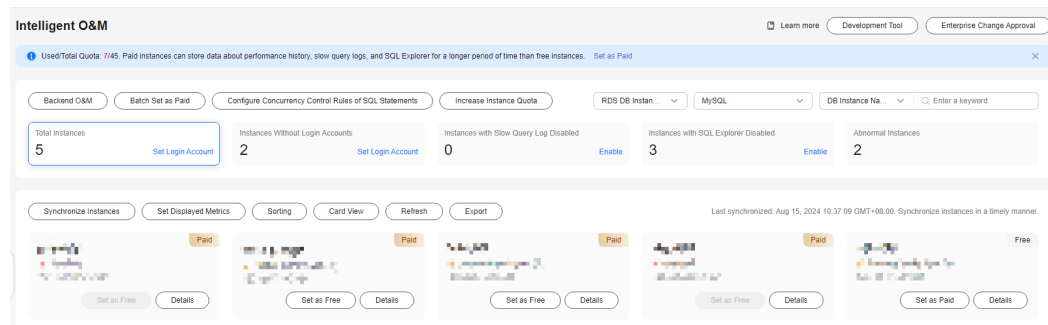
Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-238 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 In the upper right corner of the page, click **Go to Old Edition**.

Step 8 Choose **Performance > Custom Graphs**.

Step 9 Click **Create Graph**. On the displayed page, enter a graph name and specify monitoring metrics.

Step 10 Click **OK**. On the **Custom Graphs** page, view the created graph.

----End

3.16.3 Sessions

3.16.3.1 Sessions that Can Be Killed If Necessary

You can use this function in the following scenarios:

- If the number of sessions of an instance has reached the upper limit and the instance cannot be logged in to any longer, you can view and kill unnecessary sessions using the emergency channel function.
- You can view history logs to learn details of the kill operations that you performed using the emergency channel function.

Usage Notes


- This function is not available to ECS-hosted instances and instances in the creating, frozen, or abnormal state.
- The kernel version of RDS for MySQL 5.6 must be 5.6.43.3 or later, and the kernel version of RDS for MySQL 5.7 must be 5.7.25.3 or later.
- Use this function in urgent conditions. All your kill operations will be logged.
- This function is not recommended if you can log in to your instance on the DAS console. After logging in to the instance, you can perform required operations on the **Real-Time Sessions** page.
- Sessions of sensitive users such as **rdsadmin**, **rdsbackup**, **rdsmetric**, and **rdsRepl** cannot be killed.

- When the CPU usage or the number of connections reaches the upper limit, requests to kill sessions may time out. In this case, you have to try more than once.

Procedure

Step 1 Log in to the Huawei Cloud console.

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

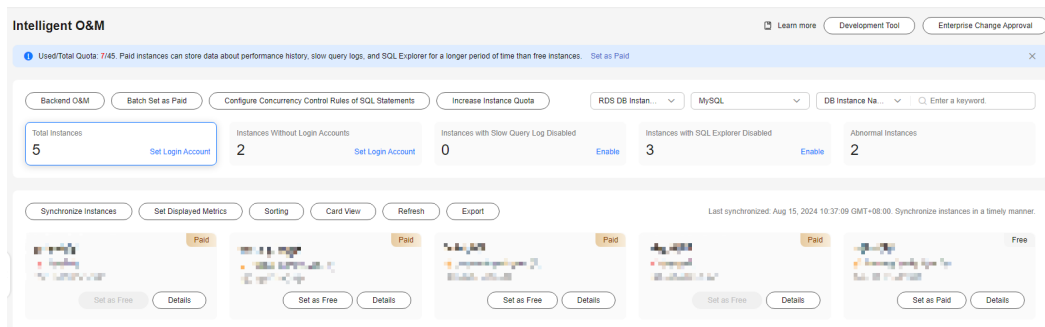
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-239 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 In the upper right corner of the page, click **Go to Old Edition**.

Step 8 Choose **Sessions** > **Sessions that Can Be Killed If Necessary** and select the sessions you want to kill.

Sessions are sorted in descending order by duration.

Step 9 Select the session you want to kill and click **Kill**.

Step 10 In the displayed dialog box, confirm the session information and click **Yes**.

Step 11 Click the **History Logs** tab and view the sessions killed.

----End


3.16.3.2 Real-Time Sessions

The real-time session function allows you to query session snapshots of your instance and can sort out and display only the required snapshots. You can quickly search for slow or active sessions in multiple dimensions like users, host IP addresses, and database names. DAS allows you to kill sessions to restore your instance, securing your database availability.

Procedure

Step 1 Log in to the Huawei Cloud console.

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

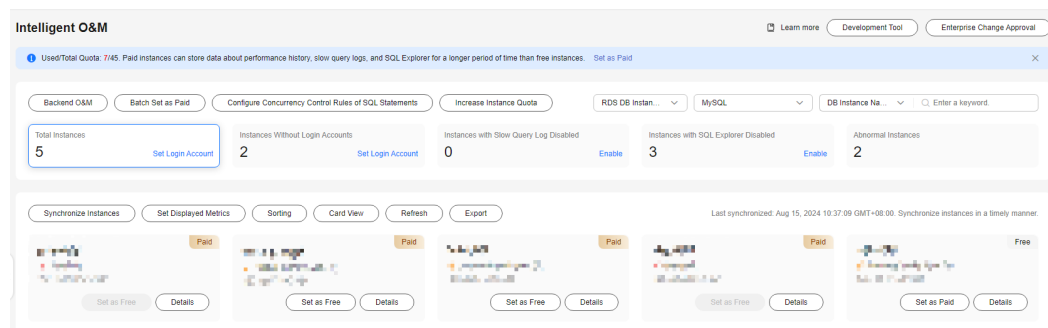
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-240 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 In the upper right corner of the page, click **Go to Old Edition**.

Step 8 Choose **Sessions** > **Real-Time Sessions** to view session statistics, sessions, and slow sessions.

In the statistical item list, you can view total sessions, running sessions, and longest running session time of the current instance. You can also view total sessions and active sessions by user, host, or database. In the **All Sessions** area, you can view session details and perform the following operations:

- Select the abnormal session you want to end and click **Kill** for your database to recover.
- Toggle on or toggle off **Hide System Sessions** so that the system automatically filters or displays sessions.
- Enable **Auto Refresh**. The task list is automatically refreshed every 30 seconds.

In the **All Sessions** area, you can view slow session details and perform the following operations:

- Set a slow session threshold and click the refresh button to search for the slow sessions that last longer than this threshold.
- Toggle on or toggle off **Hide System Sessions** so that the system automatically filters or displays sessions.
- Enable **Auto Refresh**. The task list is automatically refreshed every 30 seconds.

- Select the session you want to end and click **Kill** for the databases to recover.

----End

3.16.4 SQL

3.16.4.1 Slow Query Logs

This section describes how to analyze slow query logs in a specified period. Slow Query Log displays a chart of SQL statements that are taking too long to execute and allows you to sort slow SQL statements by multiple dimensions, such as by user, host, or SQL template. It helps you quickly identify bottlenecks and improve instance performance.


Usage Notes

- To use the slow query log function, you need to toggle on **Collect Slow Query Logs**. Then DAS will store slow query logs for analysis.
- Slow query logs of free instances are retained for only one hour while those of paid instances are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.
- You can enable the slow query logs function for a maximum of 10 free instances. There is no such a limit on paid instances.
- For free instances, you can only view slow query logs generated in the latest hour.

Viewing slow query logs

Step 1 [Log in to the Huawei Cloud console](#).

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

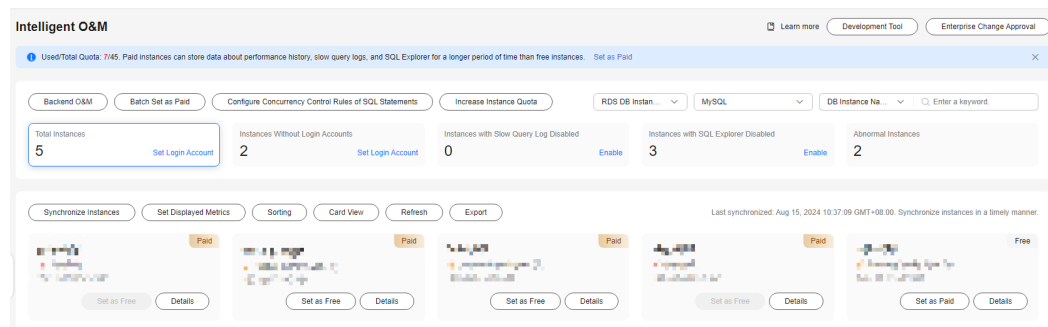
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-241 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 In the upper right corner of the page, click **Go to Old Edition**.

Step 8 Choose **SQL > Slow Query Logs**.

Step 9 Select a time range and view trends, statistics, and details of the slow query logs generated within the time range.

- Log trends

In the trends graph, you can hover your mouse at any point in time to view slow query logs or CPU usage.

Above the chart, you can switch to another instance or node to view slow queries by instance or by node.

- Details

View slow query log details in the lower part of the **Slow Query Logs** area. The details include the SQL statement, execution time, database name, client, user, execution duration, lock wait duration, and scanned and returned rows.

Click **Export** to export slow query log details to a specific OBS bucket. After the details are exported, you can click **Export History** to view export records. You can also download the details to your local PC.

 **NOTE**

This function is available to only paid instances.

Locate the SQL template you want to diagnose and click **Diagnose** in the **Operation** column.

- Slow query log statistics

Click **Sample** in the **Operation** column to view the sample of the SQL statement template.

On the **Statistics** page, click **Export** to export slow query logs to a specific OBS bucket. Then you can click **Export History** to view export records. You can also download the exported slow query logs to your local PC.

 **NOTE**

This function is available to only paid instances.

----End

Slow Query Log Storage and Archiving

- Slow query log storage

After **Collect Slow Query Logs** is enabled, SQL text content will be stored in OBS for analysis.

Slow query logs of free instances are retained for only one hour while those of paid instances are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.

For paid instances, you can click **Set Storage Duration for Slow Query Logs** to set storage duration as required.

Each paid instance can use 5 GB of storage for slow query logs for free. Any storage used in excess of 5 GB will be billed on a pay-per-use basis.

- Log archiving
Slow query logs are automatically archived every three minutes. Alternatively, you can click **Generate Latest Log File** and then view the latest statistics.
Slow query logs generated in the last 10 days are archived.
You can also download archived slow query logs to your local PC.

Deleting Slow Query Logs

On the **Slow Query Logs** tab page, you can click **Delete All** or **Delete** to delete all slow query logs or some slow query logs generated in a specific period.

NOTE

Deleted slow query logs cannot be recovered. Exercise caution when performing this operation.

3.16.4.2 SQL Explorer

After **Collect All SQL Statements** is enabled, you can gain a comprehensive insight into SQL statements on the **SQL Explorer** page. Top SQL helps you locate exceptions.

SQL Explorer can record all SQL statements executed on your instance and enables you to analyze and search for the tables that are accessed and updated the most frequently and the SQL statements that have the longest lock wait.

Usage Notes

- After **Collect All SQL Statements** is disabled, new SQL statements will not be collected and the collected SQL statements will be deleted.
- SQL Explorer cannot record all data. As for RDS for MySQL, it has the following constraints:
 - Some data cannot be recorded if a buffer overrun occurs.
 - Any SQL statement that exceeds 4096 bytes is discarded by default.
This constraint can be specified by setting parameter **rds_sql_tracer_reserve_big_records** in RDS for MySQL kernel versions 5.7.33.3 or later. RDS for MySQL 5.6 and 8.0 do not support this parameter. For example, you can set the parameter to **ON** on the [parameter settings](#) page, indicating that SQL statements whose length exceeds 4,096 bytes are still recorded.
- Logs of all SQL statements executed on free instances can be retained for only one hour while those for paid instances can be retained for seven days by default and for up to 30 days as a maximum. After the retention period expires, the logs are deleted automatically.

Execution Duration Distribution of Top SQL Templates

Step 1 [Log in to the Huawei Cloud console](#).

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


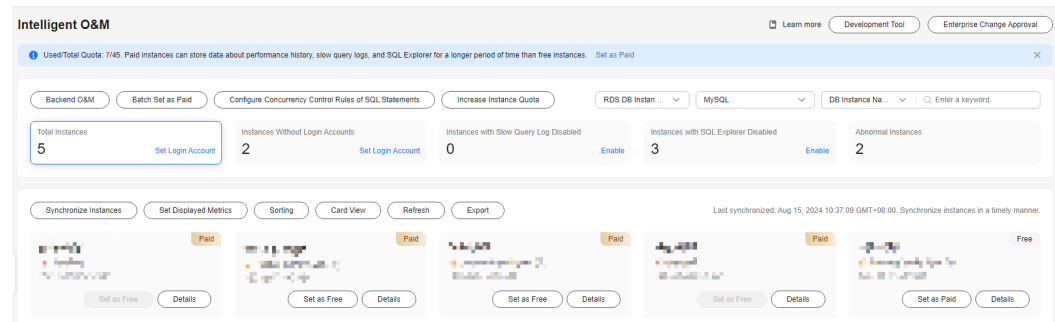
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-242 Searching for instances



- Step 6** Locate the target instance and click **Details**.
- Step 7** In the upper right corner of the page, click **Go to Old Edition**.
- Step 8** Choose **SQL > SQL Explorer**.
- Step 9** Toggle on **Collect All SQL Statements** to obtain information about all SQL statements executed on the current instance.

 **NOTE**

Collect All SQL Statements takes effect once it is enabled.

- Step 10** On the **Top SQL** tab page, view execution duration of top SQL statements.

You can select **Last hour**, **Last 3 hours**, or **Last 6 hours** to view execution durations of top SQL statements. You can also set a time range that spans no more than one day.

The Execution Duration Distribution graph shows how many times SQL statements with different elapsed time lengths are executed over a specified time range. DAS collects SQL statistics of four elapsed time lengths.

- < 100 ms: number of SQL statement executions whose elapsed time is less than 100 ms
- 100 ms–500 ms: number of SQL statement executions whose elapsed time ranges from 100 ms to 500 ms
- 500 ms–1s: number of SQL statement executions whose elapsed time ranges from 500 ms to 1s
- > 1s: number of SQL statement executions whose elapsed time is longer than 1s

SQL statistics in the four elapsed time lengths are collected over the time range you specified.

- If you select **Last hour**, SQL statement executions are calculated every 10 seconds.
- If you select **Last 6 hours**, SQL statement executions are calculated every minute.
- If you select a time range longer than 6 hours, SQL statement executions are calculated every 5 minutes.

Select **By instance** or **By node** to view execution duration distribution. You can change node to view its execution duration distribution. The primary node is selected by default. If you want to view the execution duration distribution of other nodes, click **Change Node**.

Step 11 In the SQL template list, view execution duration details, such as average execution duration, total duration, average lock wait duration, and average scanned rows.


- Hover your mouse at any point in time on the graph to view top SQL statements at that time.
- Specify a time range using your mouse on the graph, and you will see top SQL statements during that time range.
- Click **Export** to export details about all top SQL templates in the list. This function is available only to paid instances.
- In the SQL template list, locate a SQL template and click **Details** to view the total execution times, average rows scanned, average execution duration, and more.
- In the SQL template list, locate a SQL template and click **Diagnose** to view details such as the execution plan, and suggestions for tuning indexes and SQL statements.

----End

SQL Audit

Step 1 [Log in to the Huawei Cloud console](#).

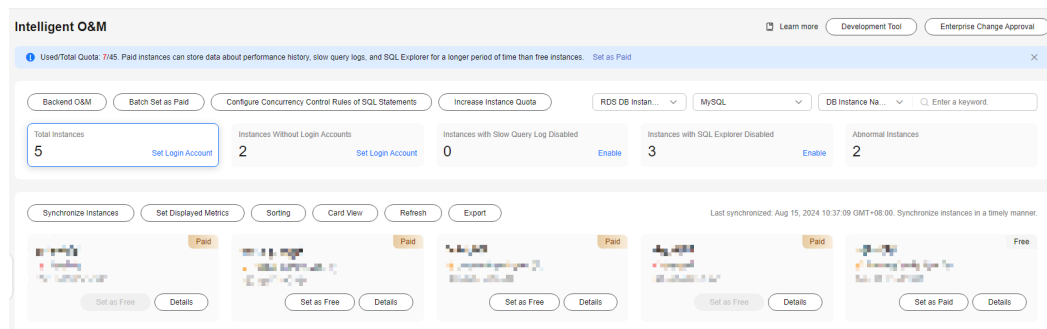
Step 2 Click  in the upper left corner and select a region and project.

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-243 Searching for instances

Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL > SQL Explorer**.

Step 8 Click the **SQL Audit** tab.

Step 9 On the **SQL Audit** tab page, view SQL audit tasks.

- Specify the start time, end time, task creation time, and node information to search for SQL audit tasks.
- Click **Add SQL Audit Task** and specify a time range to add a task. You can add an instance- or node-level task based on your service requirements. The added SQL audit task is displayed in the list below.
- Click **Details** in the **Operation** column to view task details. You can specify filters such as **Time Range**, **User**, **Keyword**, or **Database** and click **Query** to search for the SQL statements executed on the current instance. The selected time range must be after the time when the SQL audit task is added.

----End

3.16.4.3 SQL Diagnosis

This function enables you to diagnose SQL statements and obtain optimization suggestions.

CAUTION

Diagnosing a large number of SQL statements will affect performance of your instance, so you are advised to use this function on an idle instance.

Usage Notes


- This function is available only to MySQL InnoDB.
- Only SELECT, INSERT, UPDATE, and DELETE statements can be diagnosed. An INSERT statement must contain a SELECT clause.
- Currently, SQL statements of databases information_schema, test, and mysql cannot be queried.
- SQL statements that contain views cannot be diagnosed.
- SQL Diagnosis obtains table structures and data distribution information (non-original). The obtained data is only for logic diagnosis, but not stored on the DAS server.

- Obtaining table structures and data distribution information may cause additional load to your instance, but has little impact on its performance.
- SQL diagnosis history is stored on the DAS server only. If you delete SQL diagnosis history on the console, it will be also deleted from the DAS server.
- SQL formatting improves readability of SQL statements. Formatting SQL statements enables statements to be displayed in line break mode, but does not change their logic and semantics.
- SQL formatting takes effect for all the SQL statements in the SQL window. You cannot format only one selected statement.

Procedure

Step 1 Log in to the Huawei Cloud console.

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

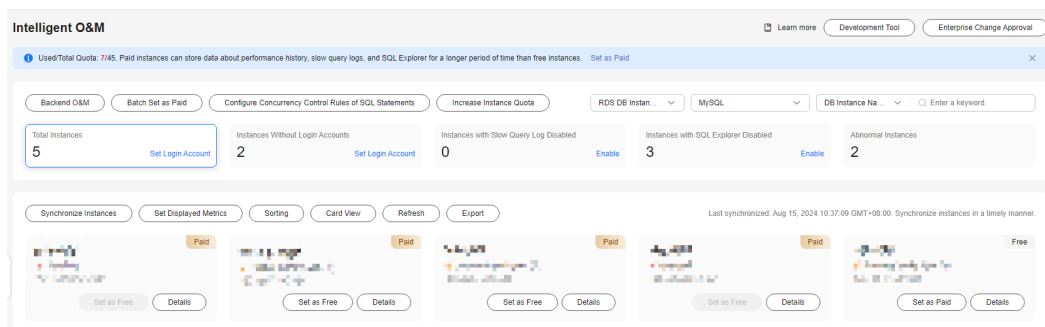
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-244 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 In the upper right corner of the page, click **Go to Old Edition**.

Step 8 Choose **SQL** > **SQL Diagnosis**. On the displayed dialog box, perform the following operations:

- On the **SQL Diagnosis** tab page, select the database where you want to diagnose a SQL statement, enter a SQL statement, and click **Diagnose**. The diagnosis result page is displayed.
- Select a database where you want to execute a SQL statement, enter a SQL statement, and click **Execute**. The system executes the statement and displays a result set.
- Select the target database, enter SQL statements, and click **Format**. The system formats all the SQL statements.

- Select the database where you want to view the SQL execution plan, enter SQL statements, and click **View Execution Plan**. The system executes all the SQL statements in sequence.

----End

3.16.4.4 SQL Statement Concurrency Control

Concurrency Control restricts the execution of SQL statements based on specified rules when there are SQL statements that cannot be optimized timely or a resource (for example, vCPU) bottleneck occurs.


Usage Notes

- The kernel version of primary RDS for MySQL instances must be 5.6.50.3, 5.7.31.4, 8.0.25.1, or later.
- The kernel version of RDS for MySQL read replicas must be 5.6.51.6, 5.7.37.1, 8.0.25.1, or later.
- Separate concurrency rules can be added for RDS for MySQL read replicas of the kernel version 5.7.38-221000 or later.
- If a SQL statement matches multiple concurrency control rules, only the latest rule takes effect.
- Keywords in a concurrency control rule are sorted in a specific order, and the system will match them from first to last. For example, if one rule contains the keyword **a~and~b**, the system only matches **xxx a>1 and b>2**.
- If the replication delay is too long, adding or deleting a concurrency control rule for a read replica does not take effect immediately.
- If you replicate data from an instance to a third-party instance based on binlogs, deleting or adding SQL statement concurrency rules from or to the instance will interrupt the replication process.
- Each SQL statement concurrency control rule can contain a maximum of 128 keywords.
- Currently, SQL Statement Concurrency Control supports only keywords **SELECT**, **UPDATE**, and **DELETE**.
- Empty characters before and after each keyword will be ignored, for example, spaces, \n, \r, and \t.
- Too many keywords or rules may affect performance. Retain only required concurrency control rules.
- Up to 100 concurrency control rules can be retained.
- If a SQL statement has been stored in query cache, it is not subject to concurrency control.
- SQL statement concurrency control does not limit concurrency for:
 - System tables
 - SQL statements used to query data, for example, **select sleep(xxx)**
 - User **root** in versions including 5.6, 5.7.41.230700 and earlier versions in 5.7, and 8.0.28.230701 and earlier versions in 8.0
 - Stored procedures, triggers, and functions

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

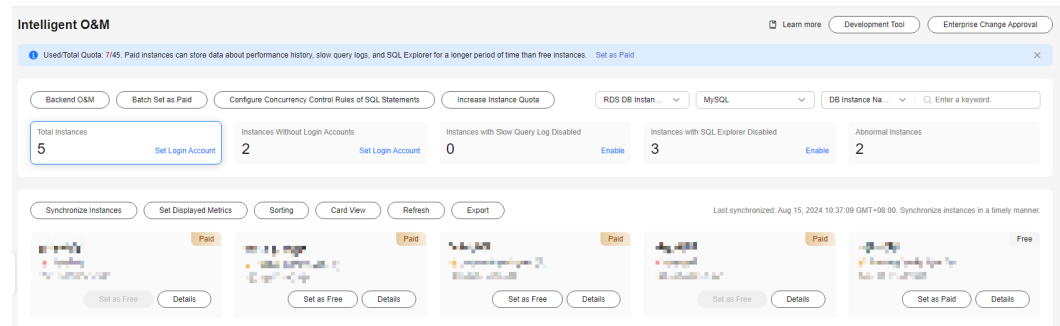
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-245 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 In the upper right corner of the page, click **Go to Old Edition**.

Step 8 Choose **SQL > SQL Statement Concurrency Control**.

Step 9 On the displayed page, toggle on **Concurrency Control**.

Step 10 Click **View Supported Versions**.

Figure 3-246 Viewing version constraints

View Supported Versions

It is supported only in the versions below.

Major Version	Primary Instance Minor Version	Rule for Read Replica
5.6	>=5.6.50-3	Not supported
5.7	>=5.7.31-4	>=5.7.38-221000
8.0	>=8.0.25-1	Not supported

This function does not work for the root account in the versions below.

Major Version	Minor Version
5.6	>=5.6.51-4
5.7	>=5.7.33-1
8.0	>=8.0.25-1

OK

Step 11 Click **Add Concurrency Control Rule**. In the displayed dialog box, select a SQL statement type, enter keywords, and specify the maximum number of concurrent SQL statements.

- **Keyword:** You can enter keywords or copy an existing SQL statement to the text box and click **Generate Keyword**.

NOTE

- Keywords generated from an original SQL statement are only for reference.
- Each SQL statement concurrency control rule can contain a maximum of 128 keywords.

The following explains how a rule matches SQL statements based on keywords:

For example, if you enter the keywords

select~id~name~from~t3~where~age~>~27 (the keywords are separated by a tilde (~)) for a rule, the system will match them from first to last and restrict the execution of any SQL statement that contains these keywords.

- **Max. Concurrency:** SQL statements that meet the specified SQL type and keywords and exceed the value of **Max. Concurrency** will not be executed.

NOTE

SQL statements that have been executed before a concurrency control rule is added are not counted.

If you add a concurrency control rule and set **Max. Concurrency** to **0**, the concurrency of the following SQL statements will be controlled:

```
"select id, name from t3 where age > 27"
"select id, name, age from t3 where age > 27"
"select id, name from t3 where age > 5 and id < 27"
```

But the concurrency of the following SQL statement will not be controlled:

```
"select name, age from t3 where age > 27"
```

Step 12 Confirm the settings and click **OK**.

If a SQL statement concurrency control rule is no longer needed, click **Delete** in the **Operation** column.

----End

3.16.5 Locks and Transactions

3.16.5.1 InnoDB Locks

InnoDB lock waits generated before DML operations are displayed in real time. You can quickly locate the session waits and blocks that happened when multiple sessions update the same piece of data at the same time, and can terminate the source session that holds locks to restore blocked operations.


NOTE

InnoDB Locks does not support metadata locks (MDLs). You view and analyze them on the **Metadata Locks** page.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

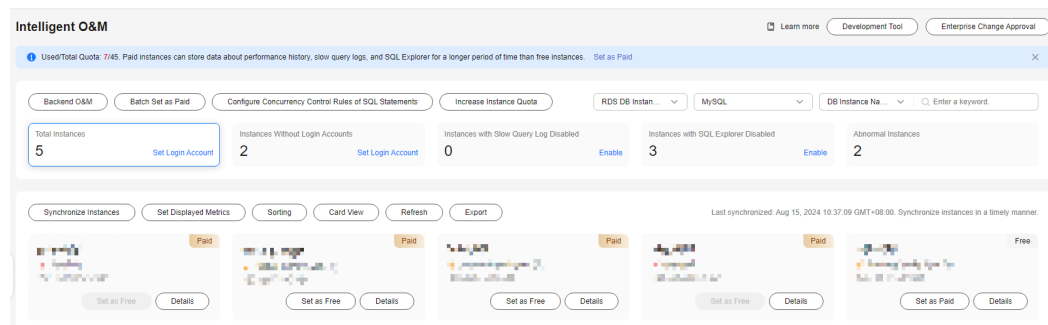
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-247 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 In the upper right corner of the page, click **Go to Old Edition**.

Step 8 Choose **Locks and Transactions > InnoDB Locks** to check whether there are lock waits.

----End

3.16.5.2 Metadata Locks

Metadata locks (MDLs) are used to ensure consistency between DDL and DML operations. Executing DDL statements on a table generates metadata write locks. If there is a metadata lock, all subsequent SELECT, DML, and DDL operations on the table will be blocked, causing a connection backlog.

Metadata locks are displayed in real time. You can quickly identify problems and terminate the sessions with metadata locks to restore blocked operations.


Precautions

- This function does not support DML locks. You can view and analyze them on the **InnoDB Locks** page.
- Metadata locks are used only in MySQL 5.6 and 5.7.
- A maximum of 1,000 records can be displayed.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

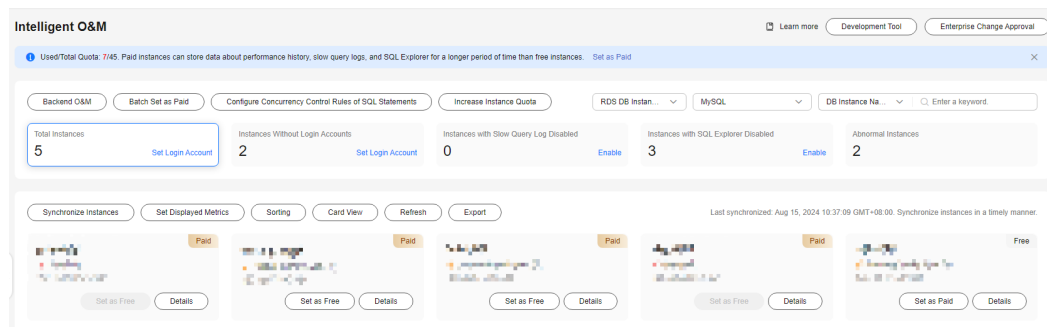
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-248 Searching for instances



Step 6 Locate the target instance and click **Details**.

- Step 7** In the upper right corner of the page, click **Go to Old Edition**.
- Step 8** Choose **Locks and Transactions > Metadata Locks**.
- Step 9** Select a lock status and type, enter a database name, table name, and session ID as needed, and click **Query**.
- Step 10** In the query result, check whether there are sessions that hold MDL locks. If yes, select the sessions as required and click **Kill**.
- End

3.16.6 Daily Reports

The **Daily Reports** page provides overall information about your instance status of the previous day, including Slow Query Logs, SQL Explorer, performance, and disk analysis. You can download and subscribe to analysis reports. A daily diagnosis is recommended.

Procedure



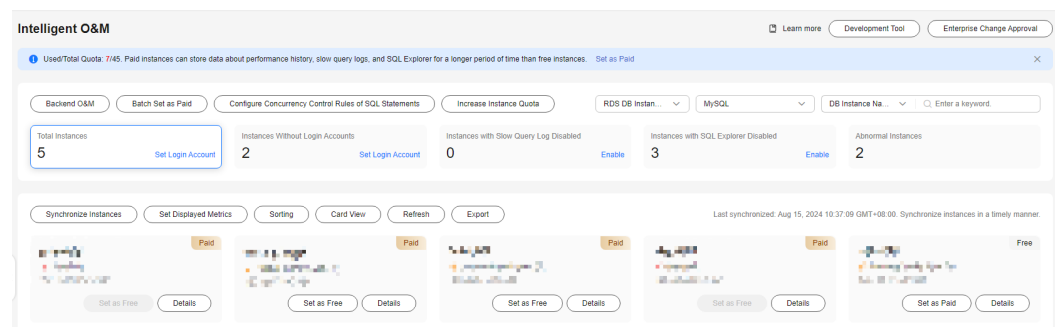
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 3-249 Searching for instances



- Step 6** Locate the target instance and click **Details**.
- Step 7** In the upper right corner of the page, click **Go to Old Edition**.
- Step 8** On the displayed page, choose **Daily Reports**.

You can perform the following operations:

- Click **Download** to download a diagnosis report to your local PC.

- Click **Subscribe** and enter your email to have the diagnosis report emailed to you.

 **NOTE**

Before subscribing to diagnosis reports, note that:

- The subscription function depends on the Simple Message Notification (SMN) service.
 - After you subscribe to daily reports, diagnosis reports will be emailed to you after you manually diagnose your instance and the result is abnormal.
- Click **Diagnose** to diagnose the current instance.
 - Click **View History Report** to view historical diagnosis reports.
 - On the **Diagnosis Overview** page, view diagnosis results of the instance.
 - On the **Analysis Dimensions** page, view diagnosis dimensions, including Slow SQL Analysis, Full SQL Analysis, and Performance & Disk Analysis.
 - On the **Specified Analysis** page, view details in a report, including slow SQL analysis, full SQL analysis, and performance and disk analysis.

----End

4 RDS for SQL Server

4.1 Account Management

4.1.1 Creating a Login Name

DAS allows you to create login accounts with different permissions for accessing databases to enhance data management security.

Procedure



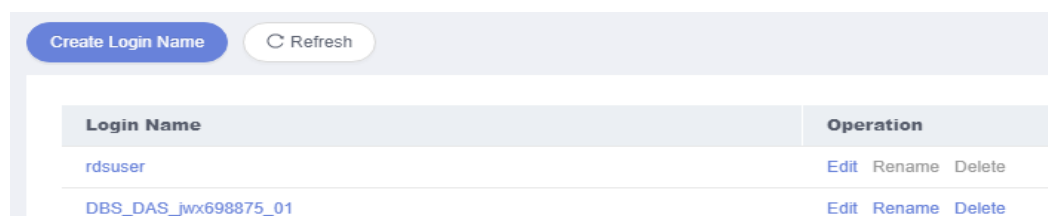
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > Login Name**.
- Step 7** Click **Create Login Name**.

Figure 4-1 Creating a login name



Login Name	Operation
rdsuser	Edit Rename Delete
DBS_DAS_jwx698875_01	Edit Rename Delete

Step 8 Set parameters on the **Basic Settings, Server Roles, User Mapping, Securables,** and **Status** tab pages separately, and click **Save**.

Figure 4-2 Creating a login name

Table 4-1 Login name information

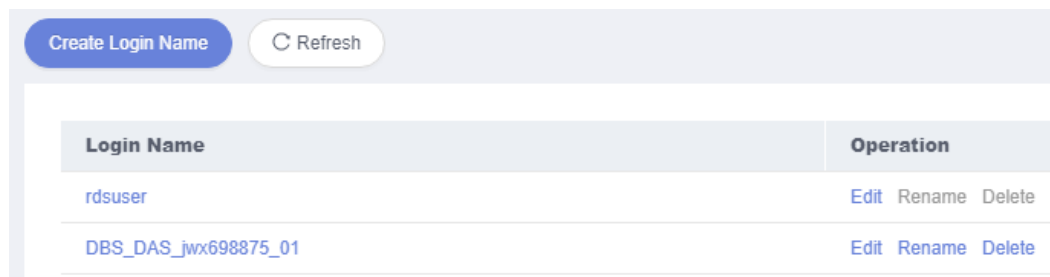
Parameter	Description
Login Name	Name of the account for logging in to the instance.
Authentication Type	The default value is RDS for SQL Server Authentication .
Password	Password of the login account. The password: <ul style="list-style-type: none"> • Can contain 8 to 128 characters. • Must contain at least three types of lowercase letters, uppercase letters, digits, and the following special characters: ~!@#%^*_-=+?&\$ • Cannot contain the login name. • Cannot be a weak password.
Confirm Password	The confirm password must be the same as the password you set.
Enforce Password Policy	If you select this option, the password must meet security rules of the SQL Server instance.
Default Database	Database that is logged in by default.

Parameter	Description
Default Language	Default language of the database.
Server Roles	Configure server roles for the login name.
User Mapping	Configure specific permissions for the login name on specific databases. NOTE If you click User Mapping and select the required databases, the system will delete user information in the User column and create new users accordingly.
Securables	Configure server-level permissions for the login name.
Status	If you select Enable , you allow the login name to log in to the current instance. If you select Disable , you do not allow the login name to log in to the instance.

Step 9 Click **Back to Login Name List** and view the newly-added login name.

Step 10 In the login name list, edit, rename, or delete the created login names as required.

Figure 4-3 Login name list



Login Name	Operation
rdsuser	Edit Rename Delete
DBS_DAS_jwx698875_01	Edit Rename Delete

----End


4.1.2 Database User Management

Multiple users with different permissions can be created to access a database, but the permissions of these users must be within the range of the account permissions.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > Database User Management**.
- Step 7** On the displayed page, select a database and click **Create User**.

Figure 4-4 Database user management



- Step 8** On the displayed page, set parameters on the **Basic Settings**, **Owned Schemas**, **Membership**, and **Securables** tab pages separately, and click **Save**.

Figure 4-5 Creating a user

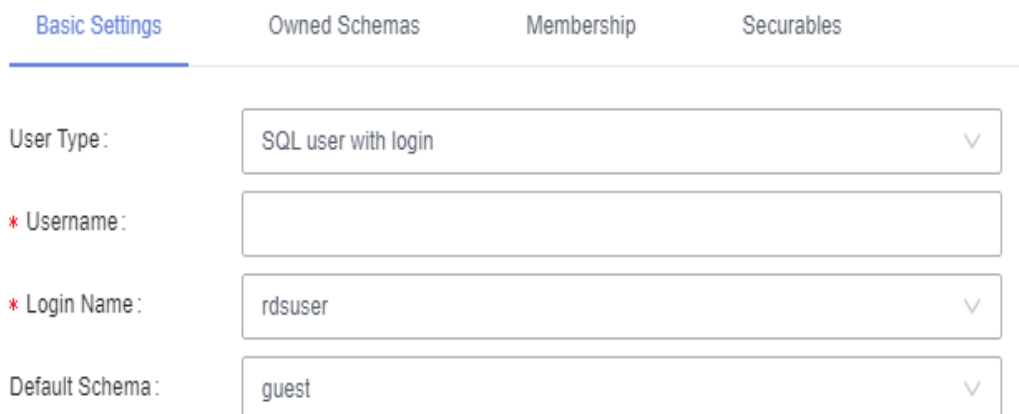


Table 4-2 Database user information

Parameter	Description
User Type	You can select SQL user with login or SQL user without login . Users without login names cannot log in, but they can be assigned permissions.
Username	Name of the database user.
Login Name	Login name associated with the database user. When the database user logs in to a database using the login name, the permissions of the login name are also the permissions of the database user.

Parameter	Description
Default Schema	The first schema that the server searches for when it resolves object names for this database user.
Owned Schemas	All schemas owned by the database user.
Membership	All roles owned by the database user. If a user has a role, it has all permissions of the role.
Securables	The user's specific permissions on database objects.

Step 9 After configuring required parameters, click **Save**. In the preview dialog box, click **OK**.

Step 10 In the user management list, edit, rename, or delete the created users.

----End


4.1.3 Database Role Management

This section describes how to create roles on the DAS console and manage these roles.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

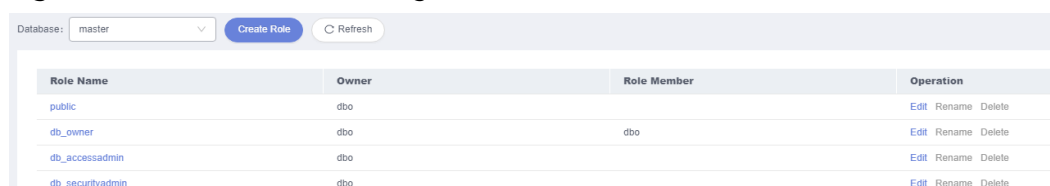
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Account Management > Database Role Management**.

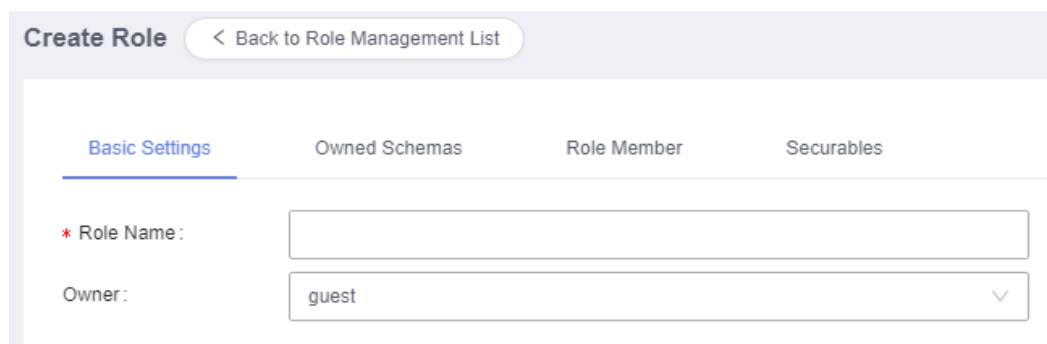
Step 7 On the displayed page, select a database and click **Create Role**.

Figure 4-6 Database role management



Role Name	Owner	Role Member	Operation
public	dbo		Edit Rename Delete
db_owner	dbo	dbo	Edit Rename Delete
db_accessadmin	dbo		Edit Rename Delete
db_securityadmin	dbo		Edit Rename Delete

Step 8 On the displayed page, set parameters on the **Basic Settings**, **Owned Schemas**, **Role Member**, and **Securables** tab pages.

Figure 4-7 Creating a role**Table 4-3** Database role information

Parameter	Description
Role Name	Name of the database role.
Owner	Owner of the role.
Owned Schemas	All schemas owned by the database role.
Role Member	Database users that own the role. If a user has a role, it has all permissions of the role.
Securables	The role's specific permissions on database objects.

Step 9 After configuring required parameters, click **Save**. In the preview dialog box, click **OK**.

Step 10 In the role management list, view information of database roles.

You can also edit, rename, and delete created database roles.

----End

4.2 Database Management


4.2.1 Creating a Database

This section describes how to create a database on the DAS console.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 In the database list of the **Home** page, click **Create Database**.

Figure 4-8 Creating a database



Step 7 On the displayed page, enter a database name and set information including recovery mode, compatibility level, and database read-only.

Figure 4-9 Creating a database

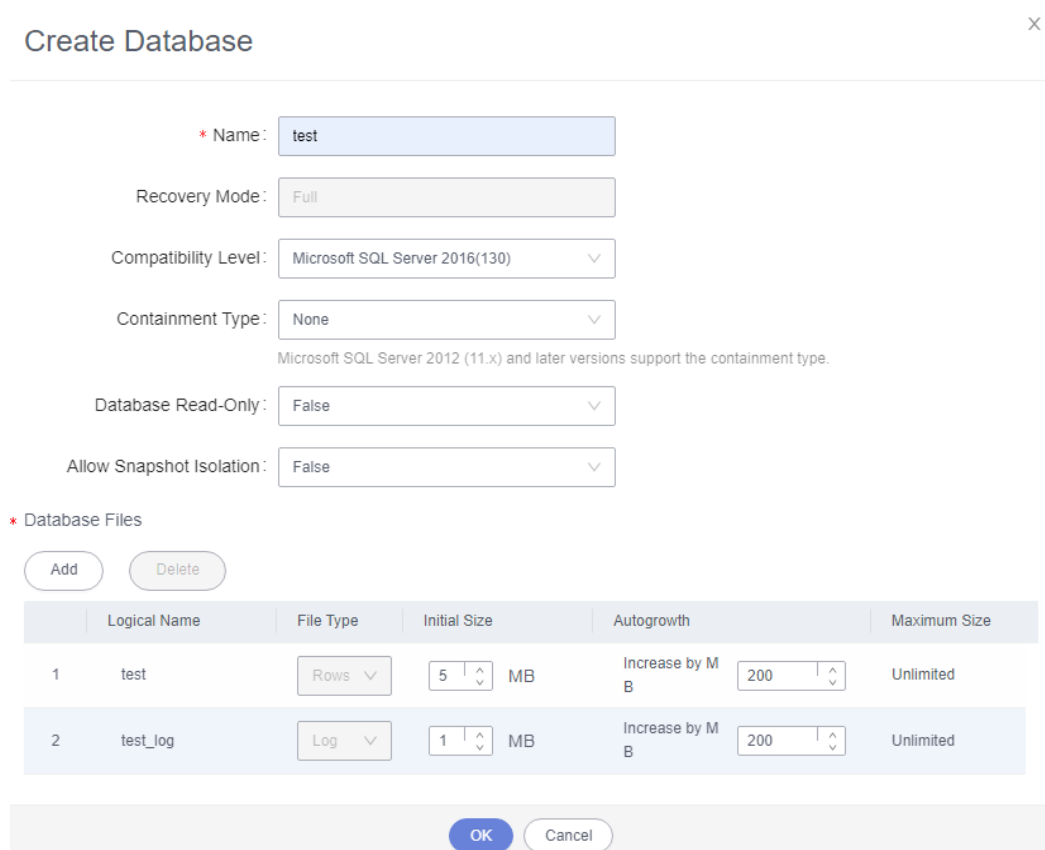


Table 4-4 Parameter description

Parameter	Description
Name	Enter a database name.

Parameter	Description
Recovery Mode	The value is Full by default, indicating a full recovery for the database.
Compatibility Level	Multiple versions of RDS for SQL Server are available. The compatibility varies with the database version. A later version is recommended.
Containment Type	The value can be None or Partial . This parameter is available only for RDS for SQL Server 2012 (11.x) and later.
Database Read-only	The value can be False or True . If True is selected, a read-only database is created.
Allow Snapshot Isolation	The value can be False or True . Value True indicates that snapshots are isolated in emergent scenarios to protect the database data.
Database Files	By default, row database files and log database files can be added. You can also modify the initial and autogrowth sizes of existing database files if needed.

- Step 8** Confirm the settings and click **OK**. View the created database in the database list.
----End

4.2.2 Dropping a Database

This section describes how to drop a database that is no longer needed.

Precautions

Dropped databases cannot be recovered. Exercise caution when performing this operation.

Procedure



- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** In the database list, locate the database you want to drop and choose **More > Drop** in the **Operation** column.

Figure 4-10 Dropping a database

Database Name	Table Quantity	Database Size	Status	Character Set	Operation
	--	--	ONLINE	Chinese_PRC_CI_AS	Manage Query SQL Statements Create Table More ▾
test	1	9MB	ONLINE	Chinese_PRC_CI_AS	Manage Query SQL Statements Create Table Edit Drop

Step 7 In the displayed dialog box, click **Yes**.

----End

4.3 SQL Operations

4.3.1 SQL Window

DAS allows you to run various SQL statements in the graphical SQL window, helping you easily manage databases.

Introduction to SQL Window

Figure 4-11 SQL window

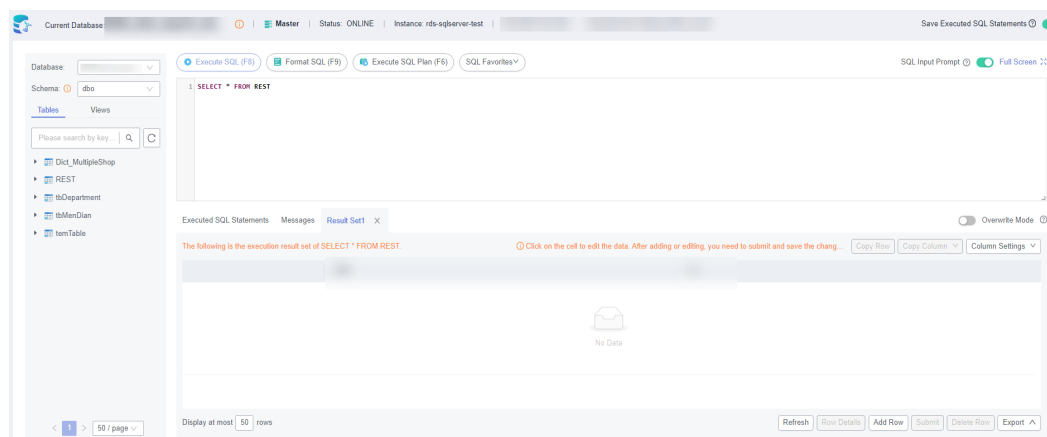


Table 4-5 Function description


Function	Description
Execute SQL	Executes SQL statements. SQL operations are performed on tables and views in a database.
Format SQL	Improves readability of SQL statements. Formatting SQL statements enables statements to be displayed in line break mode, but does not change their logics and semantics. SQL formatting takes effect for all the SQL statements in the SQL window. You cannot format only one selected statement.
Execute SQL Plan	Reports execution of SQL statements to make troubleshooting easy and optimize SQL processing performance.

Function	Description
SQL Favorites	Allows you to add, view, and manage frequently-used SQL statements.
Save Executed SQL Statements	Saves the recently executed SQL statements to the server.
SQL Input Prompt	Helps you quickly enter a specific database, table, or field name when you enter a SQL statement in the SQL window.
Full Screen	Shows SQL statements on a full screen.
Executed SQL Statements	Shows the SQL execution details.
Messages	Shows the information returned after a SQL statement is executed.
Result Set	Shows SQL execution results. Allows you to view details about a single row, add a row, submit for editing, delete a row, export a row, copy a row, copy a column, set a column, and more.
Overwrite/Append Mode	<ul style="list-style-type: none">● Append Mode: Each time a SQL statement is executed, the new result set is appended to the previous one.● Overwrite Mode: Each time a SQL statement is executed, the new result set overwrites the previous one.

Opening the SQL Window

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

----End

4.3.2 Executing SQL Statements

This section describes how to execute various SQL statements.

Procedure



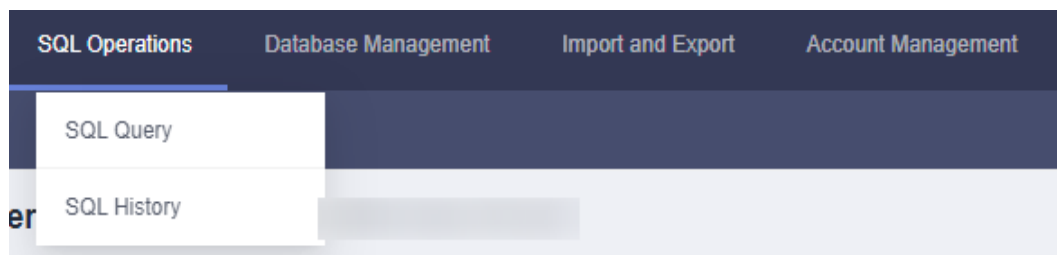
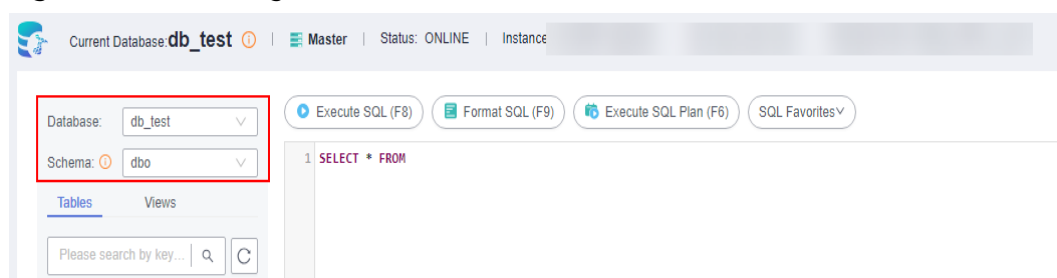
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.

Figure 4-12 Opening the SQL window



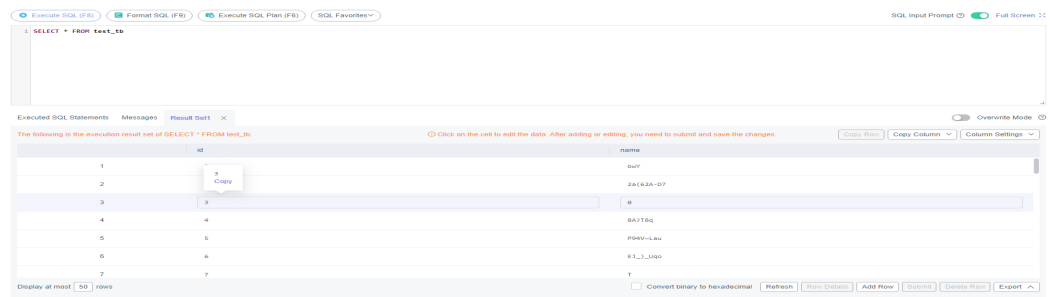
- Step 7** In the upper left corner of the page, select a database and schema.

Figure 4-13 Selecting a database



- Step 8** Enter a SQL statement in the SQL window and click **Execute SQL**.

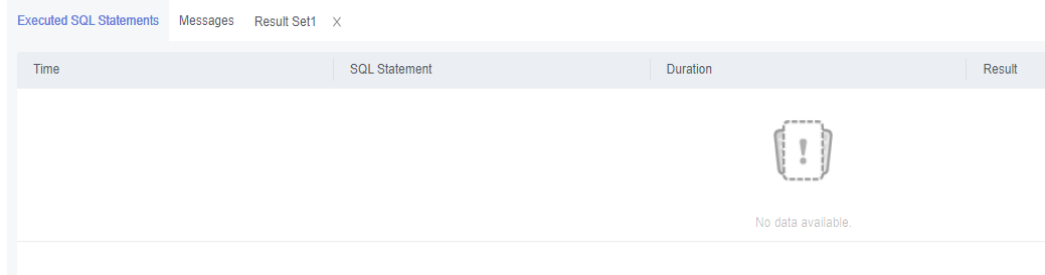
Figure 4-14 Executing a SQL Statement



- Enabling **SQL Input Prompt** is recommended. It helps you select the required database, table, or field name when you enter a SQL statement in the SQL window.
- To protect query result sets from being displayed as garbled characters, select an encoding format other than the default encoding format, UTF-8.
- You can execute multiple SQL statements at a time. Separate them using semicolons (;). You can click **Full Screen** to view logics in SQL statements clearly.
 - To execute some of the SQL statements, select the statements before executing them.
 - To execute all SQL statements, do not select any SQL statements or select all SQL statements.

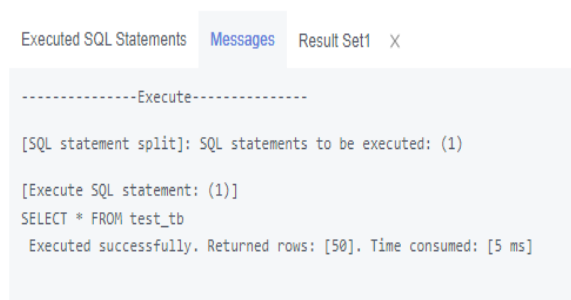
Step 9 View execution details of the current SQL statement and previously executed SQL statements in the lower part of the page.

Figure 4-15 Viewing execution records



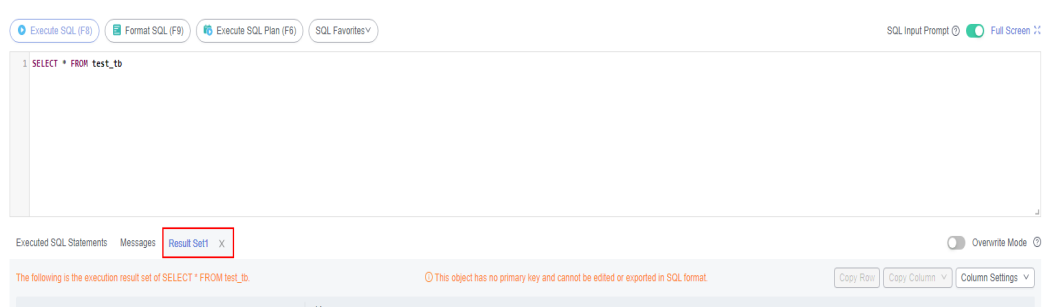
Step 10 Click the **Messages** tab, view SQL execution details, including affected rows, progress, and time required.

Figure 4-16 Viewing messages



Step 11 On the **Result Set** tab, view SQL execution results.

Figure 4-17 Viewing result sets



You can also perform the operations described in [Table 4-6](#) on result sets.

Table 4-6 Operations

Function	Description
Copy Row and Copy Column	Copies a row or column for reuse.
Column Settings	Customizes the display of columns when there are a number of columns in the query result.
Convert binary to hexadecimal	Converts binary data in the result set into hexadecimal data for display.
Refresh	Refreshes changed data.
Row Details	Displays the column field name, type, and data of the selected row.
Add Row	Adds an empty row to the result set.
Submit	Views the SQL statements to be modified. After you click OK , the result set is updated to the latest.
Delete Row	Deletes the selected row, including data.
Export	The SQL, CSV, and Excel files are supported. No more than 7.84 MB of data with 10,000 records can be exported. The actual size of an Excel file may exceed 7.84 MB due to its format.
Export More	Redirects you to the data export page and allows you to export over 10,000 rows of data.

NOTE

- If the result set involves a view, data in the result set cannot be edited.
- If the type of the result set is metadata, the data cannot be edited or displayed on multiple pages.
- If the result set involves multiple tables, data in the result set cannot be edited.
- If only one table is in the result set and does not contain all primary key columns or any primary keys, you cannot edit the data.
- Data in virtual tables (for example, tables generated during execution of a stored procedure) cannot be edited.

----End

4.3.3 Executing SQL Plan

This section describes how to analyze the execution efficiency of a SQL statement.

Procedure



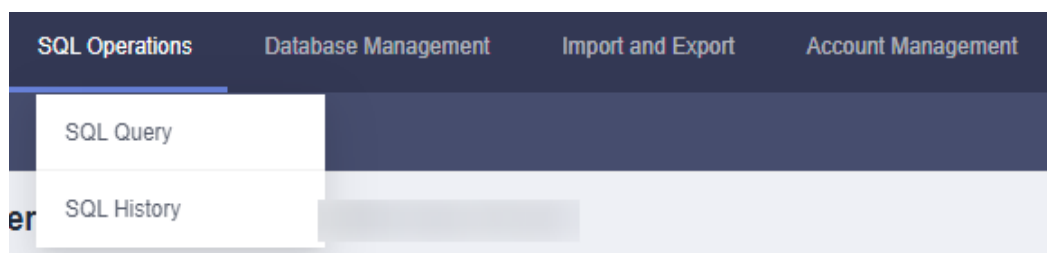
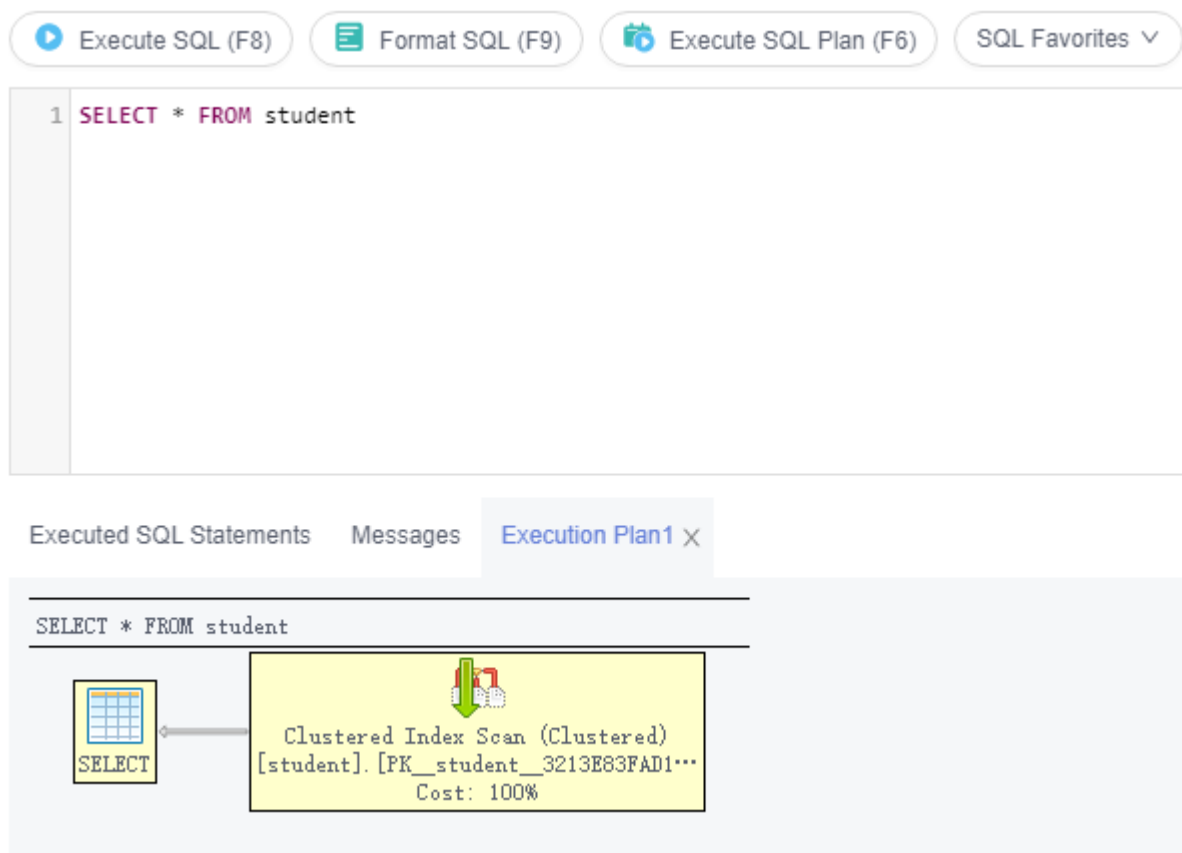
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.

Figure 4-18 Opening the SQL window



- Step 7** Enter a SQL statement in the SQL window and click **Execute SQL Plan**.

Figure 4-19 Executing SQL plan



- On the **Executed SQL Statements** tab page, view SQL execution history.
- On the **Messages** tab page, view execution information, including SQL splitting, execution status, and elapsed time.
- On the **Execution Plan** tab page, view SQL execution details. Execution plan details of SQL statements are displayed on different tabs.

----End

4.3.4 SQL Favorites

This section describes how to add frequently-used SQL statements and view and manage them.

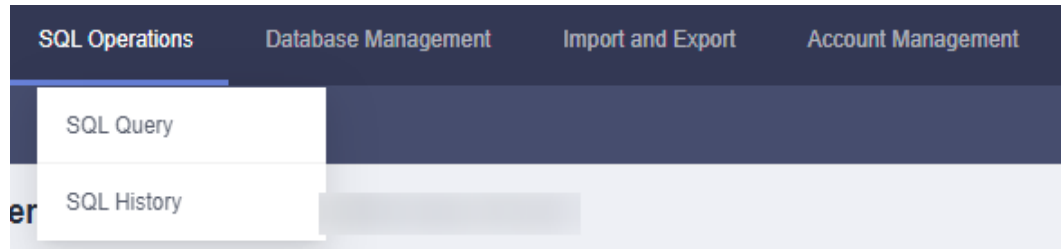
Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

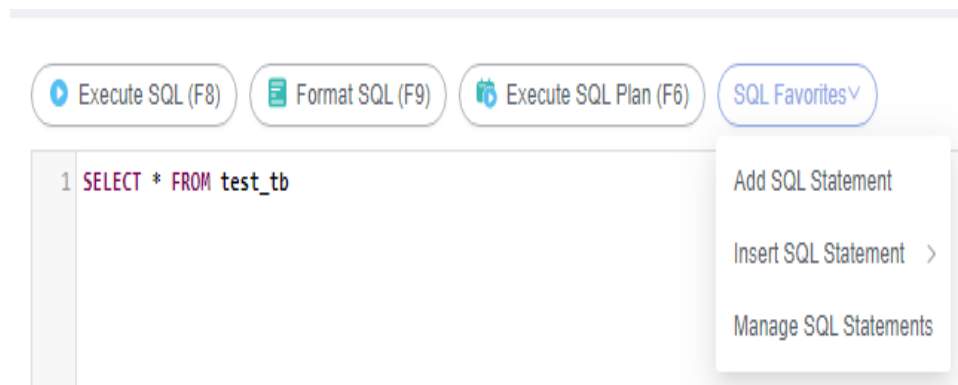
Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

Figure 4-20 Opening the SQL window



Step 7 In the SQL window, click **SQL Favorites**.

Figure 4-21 SQL favorites



- **Add SQL Statement:** allows you to add frequently-used SQL statements. Specifically, specify a title, select an application scope, enter SQL statements, and then click **Save**.

Figure 4-22 Adding a SQL statement

Add SQL Statement

* Title:

Application Scope: All DB instances Current DB instance Current database

* SQL statement:

```
1 SELECT * FROM student
```

- **Insert SQL Statement:** allows you to view the SQL statements you have added. If there are no SQL statements stored in your account, this option will not be displayed.
- **Manage SQL Statements:** allows you to manage frequently-used SQL statements, including adding, editing, and deleting statements.

Figure 4-23 Managing SQL statements

Manage SQL Statements ×

All

	Title	Storage Location	SQL statement	Operation
1	DAS	Instance: rds-10d7-...	SELECT * FROM	Edit Delete

Total Records: 1 < 1 > 10 / page

----End

4.3.5 SQL History

After you toggle on **Save Executed SQL Statements**, DAS will save the SQL statements you executed in the SQL window for future view. You can also execute the SQL statements again with no need to enter them again in the SQL window.

Prerequisites

You have enabled **Save Executed SQL Statements** in the upper right corner of the **SQL Query** page. After this function is enabled, executed SQL statements will be saved on the DAS management host.


Constraints on Usage

SQL statement execution records can be stored for up to one year.

Procedure

Step 1 Log in to the Huawei Cloud console.

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

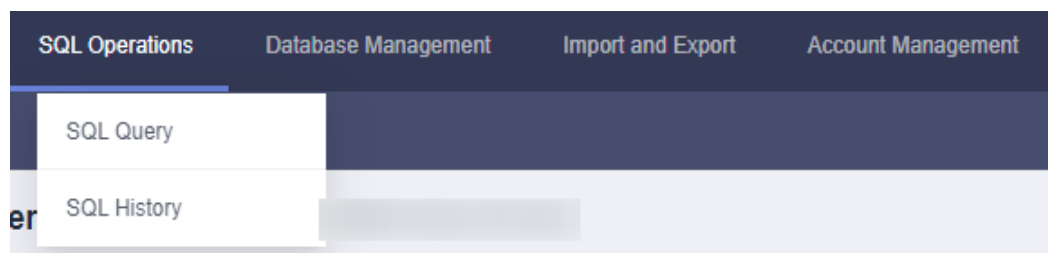
Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

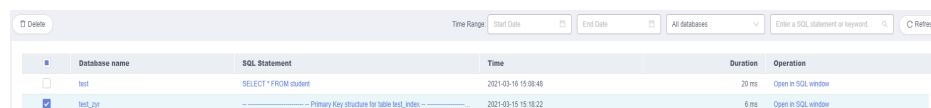
Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

Figure 4-24 Opening the SQL window



Step 7 On the displayed page, search for execution information about the target SQL statement by time range, database name, or keyword.

Figure 4-25 SQL history

The image shows a table with the following columns: Database name, SQL Statement, Time, Duration, and Operation. The table contains two rows of data. The first row is for a database named 'test' with the SQL statement 'SELECT * FROM student', executed at '2021-03-15 15:08:48' with a duration of '20 ms'. The second row is for a database named 'test_02f' with the SQL statement '----- Primary Key structure for table test_index -----', executed at '2021-03-15 15:18:22' with a duration of '5 ms'. The 'Operation' column contains links to 'Open in SQL window' for both rows.

Database name	SQL Statement	Time	Duration	Operation
test	SELECT * FROM student	2021-03-15 15:08:48	20 ms	Open in SQL window
test_02f	----- Primary Key structure for table test_index -----	2021-03-15 15:18:22	5 ms	Open in SQL window

- To access the **Database Management** page, click a database name.
- To copy a SQL statement, click it in the **SQL Statement** column.
- To execute a SQL statement, click **Open in SQL window** in the **Operation** column.

----End

4.4 Table Management

4.4.1 Creating a Table

A data table consists of basic information, columns, indexes, foreign keys, and CHECK constraints. The indexes, foreign keys, and CHECK constraints are optional and can be configured based on service requirements.

Procedure



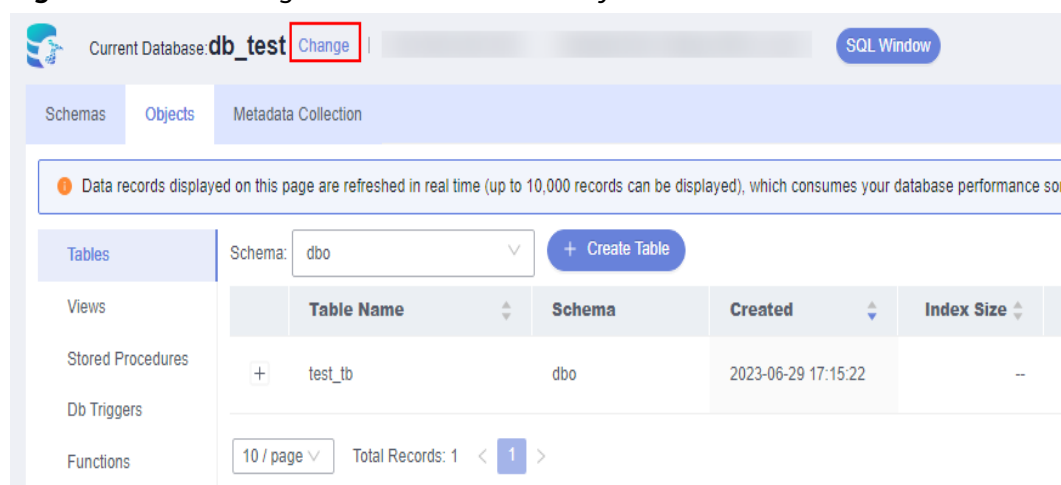
- Step 1** Log in to the Huawei Cloud console.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 4-26 Switching to the database where you want to create a table



- Step 8** On displayed page, click **Create Table**.

Figure 4-27 Creating a table



- Step 9** On the displayed **Basic Information** page, enter a table name, specify the schema, table lock escalation, and enter comments.

Figure 4-28 Basic information

The screenshot shows the 'Basic Information' page with the following fields:

- Table Name:** A text input field.
- Schema:** A dropdown menu with 'dbo' selected.
- Table Lock Escalation:** A dropdown menu with 'TABLE' selected.
- Comment:** A text area.

- Step 10** Click **Next**.

- Step 11** On the **Column** page, click **Add** and set **Column Name**, **Type**, **Nullable**, **Primary Key**, and **Extended Information** as needed.

- If you do not need to add indexes, foreign keys, or CHECK constraints, click **Create**.
- If you need to add indexes, foreign keys, or CHECK constraints, click **Next** until all your desired parameters are specified. After the setting is complete, click **Create**.

- Step 12** In the **SQL Preview** dialog box, click **Execute**.

----End


4.4.2 Opening a Table

If a table has primary keys, you can add, delete, modify, or query table data as you do in Excel.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).

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

- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

- Step 4** In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

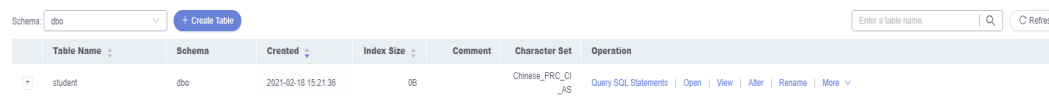
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to open a table.

Figure 4-29 Switching to the database where you want to open a table



- Step 8** On the displayed **Objects** tab, choose **Tables** on the left. In the table list, locate the table you want to open, and click **Open** in the **Operation** column.

Figure 4-30 Opening a table



- Step 9** On the table details page, double-click a cell to edit data. After adding or editing data, submit and save the changes.

Table 4-7 UI operations

Name	Description
Where Condition	Filters records.
Copy Row	Copies data of the selected row. Specifically, double-click the target row and then click Copy Row .
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.
Column Settings	Allows you to set the columns you want to display.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.

Name	Description
Add Row	Allows you to add rows.
Submit	Allows you to submit and save the changes to data.
Delete Row	Allows you to delete the selected rows.
Export	Exports a maximum of 10,000 data records to a CSV or SQL file.

----End

4.4.3 Viewing Details of a Table

This section describes how to view basic information of a table and the SQL statement for creating this table.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** In the upper area of the page, click **Change** on the right of current database to switch to the database where you want to view details of a table.

Figure 4-31 Switching to the database where you want to view details of a table



Step 8 On the displayed **Objects** tab, choose **Tables** on the left. In the right pane, locate the table whose details you want to view and click **View** in the **Operation** column.

Figure 4-32 Viewing details of a table



Table Name	Schema	Created	Index Size	Comment	Character Set	Operation
student	dbo	2021-02-18 15:21:36	0B		Chinese_FRC_CI_AS	Query SQL Statements Open View Alter Rename More

Step 9 In the displayed dialog box, view basic table information and DDL information.

----End

4.4.4 Altering a Table

After a table is created, you can alter information of the table, including basic information, columns, generated columns, indexes, and foreign keys.

Usage Notes

Improper alterations on a table will cause instance or service exceptions.

Procedure



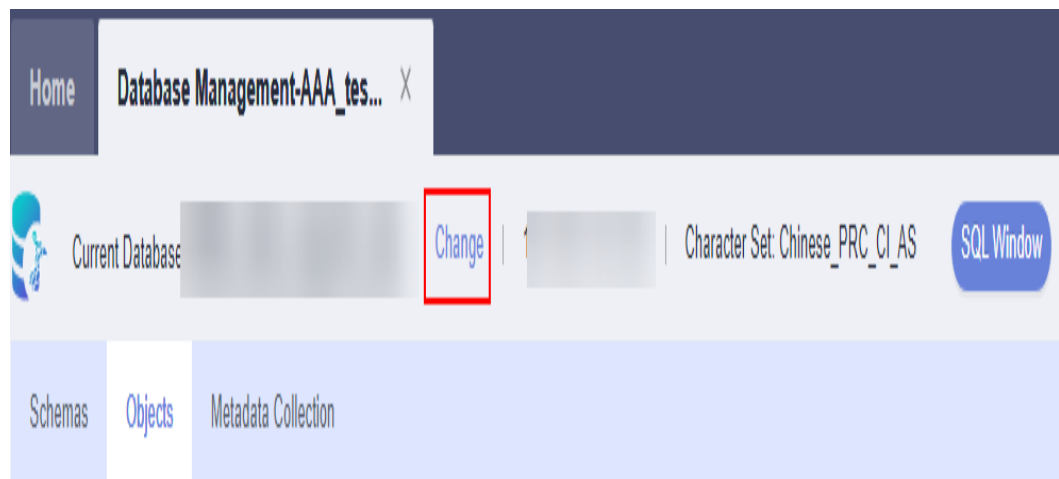
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to alter a table.

Figure 4-33 Switching to the database where you want to alter a table



Step 8 On the displayed **Objects** tab, choose **Tables** on the left.

Step 9 In the right pane, locate the table that you want to alter and click **Alter** in the **Operation** column.

Figure 4-34 Altering a table

The screenshot shows the 'Alter Table' configuration page. At the top, the 'Schema' is set to 'dbo' with a '+ Create Table' button. Below is a table listing the table to be altered:

Table Name	Schema	Created	Index Size	Comment	Character Set	Operation
student	dbo	2021-02-18 15:21:36	0B		Chinese_PRC_CI_AS	Query SQL Statements Open View Alter Rename More

Step 10 Modify the table information as required. After the modification is complete, click **Alter**.

Figure 4-35 Altering table settings

The screenshot shows the 'Column' configuration step in the table alteration process. At the top, there is a progress bar with three steps: 'Basic Information' (checked), '2 Column' (active), and 'Indexes(Optional)'. Below the progress bar are 'Add' and 'Delete' buttons. The main part of the screenshot is a table defining the columns:

No.	Column Name	Type	Nullable	Primary Key
1	id	int	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	name	text	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Step 11 In the **SQL Preview** dialog box, click **Execute**.

----End


4.4.5 Renaming a Table

This section describes how to rename a created table.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to rename a table.

Figure 4-36 Switching to the database where you want to rename a table



Step 8 On the displayed **Objects** tab, choose **Tables** on the left.

Step 9 In the right pane, locate the table that you want to rename and click **Rename** in the **Operation** column.

Step 10 In the displayed dialog box, enter a new table name and click **OK**.

----End

4.4.6 Clearing a Table

This section describes how to clear data in a table.

Usage Notes

Cleared tables cannot be recovered. Exercise caution when performing this operation.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to clear a table.

Figure 4-37 Switching to the database where you want to clear a table



- Step 8** On the displayed **Objects** tab, choose **Tables** on the left.
- Step 9** In the right pane, locate the table you want to clear, and choose **More > Clear** in the **Operation** column.
- Step 10** In the displayed dialog box, click **Yes**.

----End

4.4.7 Dropping a Table

This section describes how to drop a table that is no longer needed.

Usage Notes

Dropped tables cannot be recovered. Exercise caution when performing this operation.

Procedure



- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to delete a table.

Figure 4-38 Switching to the database where you want to delete a table



- Step 8** On the displayed **Objects** tab, choose **Tables** on the left.
- Step 9** In the right pane, locate the table you want to drop and choose **More > Drop** in the **Operation** column.
- Step 10** In the displayed dialog box, click **Yes**.
----End

4.5 View Management

4.5.1 Creating a View

This section describes how to create a view on the DAS console.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to create a view.

Figure 4-39 Switching to the database where you want to create a view



- Step 8** On the displayed **Objects** page, select **Views**. In the upper left corner of the page, click **Create View**.

Figure 4-40 Creating a view

Schema:

View Name

test

Step 9 On the displayed page, click **Set Template Parameter**. In the displayed dialog box, set parameters as required and click **Apply Template**.

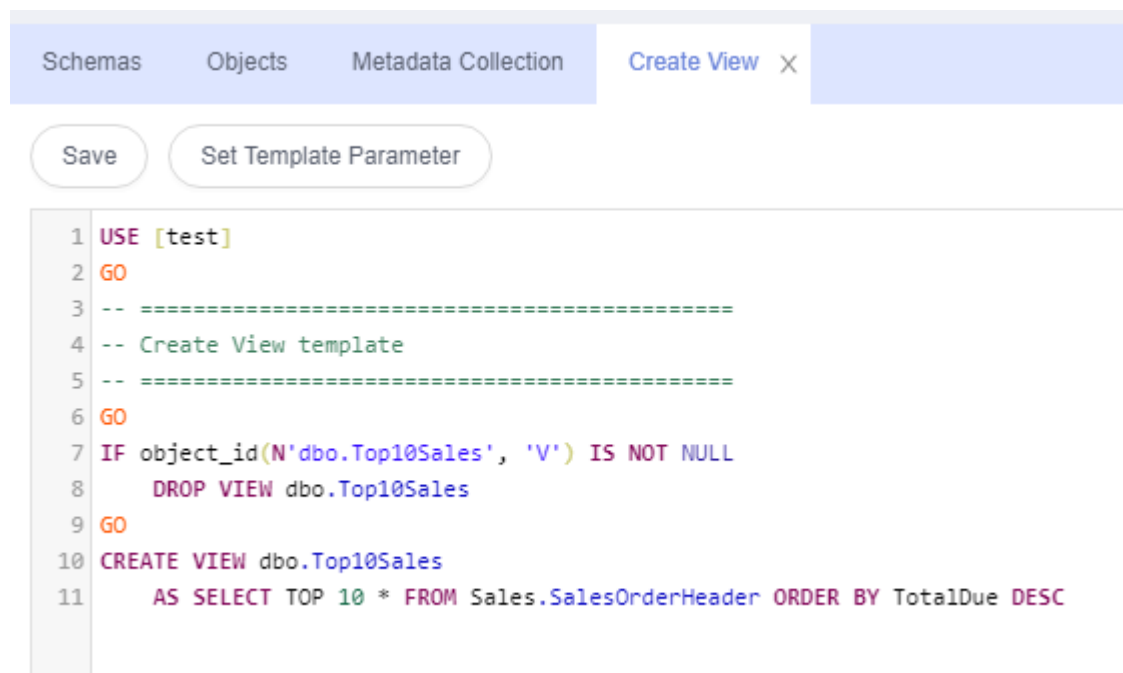
Figure 4-41 Setting template parameters

Set Template Parameter x

Parameter	Type	Value
schema_name	sysname	<input type="text" value="dbo"/>
view_name	sysname	<input type="text" value="Top10Sales"/>
select_statement		<input type="text" value="SELECT TOP 10 * FROM Sales.SalesOrderHeader ORDER BY"/>

Step 10 Click **Save**.

Figure 4-42 Creating a view



----End

4.5.2 Dropping a View

This section describes how to drop a view that is no longer needed.

Usage Notes

A dropped view cannot be recovered.

Procedure



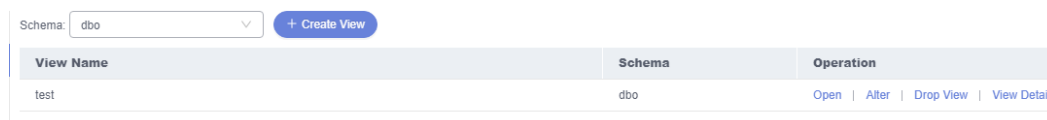
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to delete a view.

Figure 4-43 Switching to the database where you want to delete a table

Step 8 On the displayed **Objects** page, choose **Views**. In the right pane, locate the view that you want to drop and click **Drop View** in the **Operation** column.

Figure 4-44 Dropping a view

Step 9 In the displayed dialog box, click **Yes**.

----End


4.5.3 Opening a View

This section describes how to view details of a view on the DAS console.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

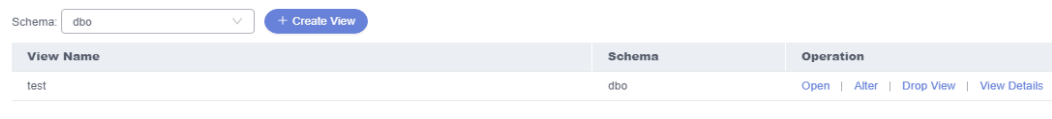
Step 7 In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to open a view.

Figure 4-45 Switching to the database where you want to open a view



Step 8 On the displayed **Objects** page, choose **Views**. In the right pane, locate the view that you want to open and click **Open** in the **Operation** column.

Figure 4-46 Opening a view



Step 9 On the displayed page, check view details and query view information using a Where condition.

Table 4-8 UI operations

Name	Description
Where Condition	Filters records.
Copy Row	Copies data of the selected row. Specifically, double-click the target row and then click Copy Row .
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.
Column Settings	Allows you to set the columns you want to display.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.
Export	Exports a maximum of 10,000 data records to a CSV or SQL file. If you choose Export > Export More , the system directs you to the Export page, and you can create an export task or quickly export data.

 NOTE

Views do not have primary keys and their data can only be queried.

----End

4.5.4 Altering a View

Usage Notes

Improper alterations on a view will cause instance or service exceptions.

Procedure



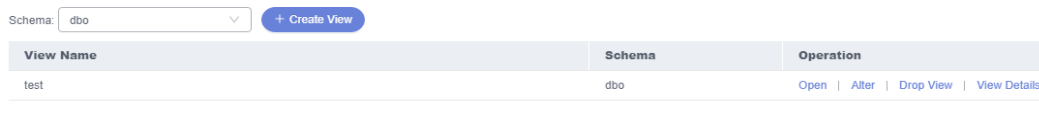
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to alter a view.

Figure 4-47 Switching to the database where you want to alter a view



- Step 8** On the displayed **Objects** page, choose **Views**. In the right pane, locate the view that you want to alter and click **Alter** in the **Operation** column.

Figure 4-48 Altering a view

Step 9 Modify the view information as required and click **Save**.

----End


4.5.5 Viewing Details of a View

This section describes how to view details of a view, which show the SQL statement for creating it.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to view details of a view.

Figure 4-49 Switching to the database where you want to view details of a view

Step 8 On the **Objects** tab page, choose **Views**.

Step 9 Locate the view whose details you want to view and click **View Details** in the **Operation** column.

Figure 4-50 Viewing details of a view



Step 10 In the displayed dialog box, view the SQL statement for creating the view.

----End

4.6 Stored Procedure Management

4.6.1 Creating a Stored Procedure

A stored procedure is a set of SQL statements used to implement specific functions. After being compiled, stored procedures are stored in databases. You can execute the stored procedures by specifying their names and related parameters.

A stored procedure consists of a set of SQL statements that can complete specific tasks or process complex services. This section describes how to create a stored procedure. You can use loop statements in a stored procedure to insert objects repeatedly.


Prerequisites

You have obtained the CREATE PROCEDURE permission.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

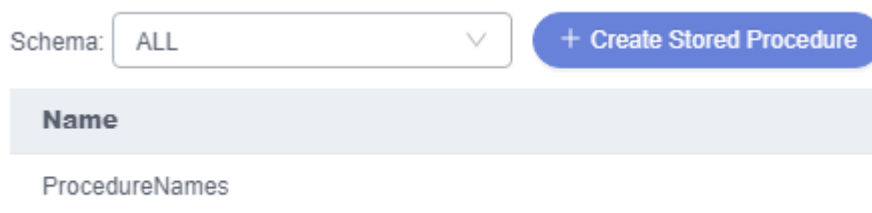
Step 7 In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to create a stored procedure.

Figure 4-51 Switching to the database where you want to create a stored procedure



Step 8 On the displayed **Objects** page, select **Stored Procedures**. In the upper left corner of the page, click **Create Stored Procedure**.

Figure 4-52 Creating a stored procedure



Step 9 On the displayed page, click **Set Template Parameter**. In the displayed dialog box, set parameters as required and click **OK**.

Figure 4-53 Setting template parameters

Set Template Parameter

Parameter	Type	Value
Schema_Name	sysname	<input type="text" value="dbo"/>
Procedure_Name	sysname	<input type="text" value="ProcedureName"/>
@Param1	sysname	<input type="text" value="@p1"/>
Datatype_For_Param1		<input type="text" value="int"/>
Default_Value_For_Param1		<input type="text" value="0"/>
@Param2	sysname	<input type="text" value="@p2"/>
Datatype_For_Param2		<input type="text" value="int"/>
Default_Value_For_Param2		<input type="text" value="0"/>

Step 10 On the page for creating a stored procedure, click **Execute**.

Figure 4-54 Executing a stored procedure

```

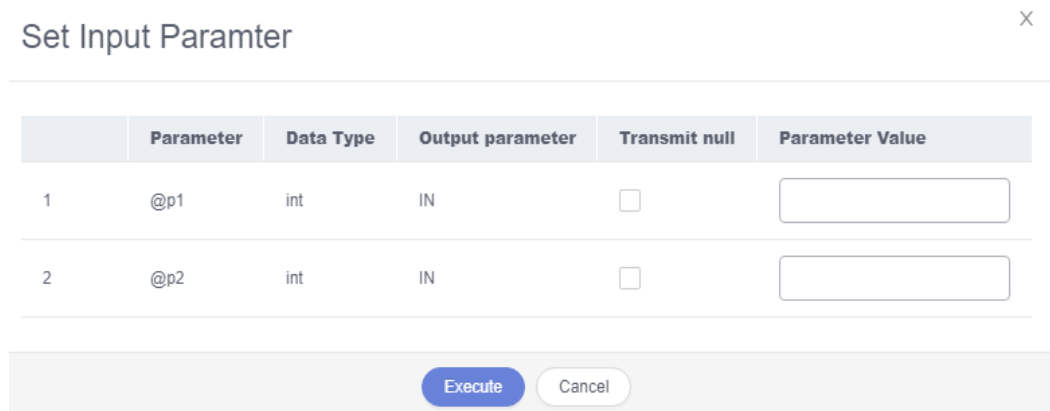
1 USE [test]
2 GO
3 -- =====
4 -- Template generated from Template Explorer using:
5 -- Create Procedure (New Menu).SQL
6 --
7 -- This block of comments will not be included in
8 -- the definition of the procedure.
9 -- =====
10 SET ANSI_NULLS ON
11 GO
12 SET QUOTED_IDENTIFIER ON
13 GO
14 CREATE PROCEDURE dbo.ProcedureName
15     -- Add the parameters for the stored procedure here
16     @p1 int = 0,

```

[Message](#)

Step 11 In the displayed dialog box, set input parameters and click **Execute**.

Figure 4-55 Executing



	Parameter	Data Type	Output parameter	Transmit null	Parameter Value
1	@p1	int	IN	<input type="checkbox"/>	<input type="text"/>
2	@p2	int	IN	<input type="checkbox"/>	<input type="text"/>

Execute Cancel

Step 12 View the execution status on the **Message** and **Result Set** tab pages after the execution of the stored procedure.

----End

4.6.2 Altering or Executing a Stored Procedure

This section describes how to alter or execute a stored procedure on the DAS console.


Usage Notes

Improper alterations on a stored procedure will cause instance or service exceptions.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

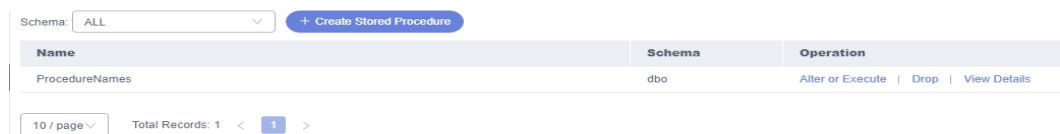
Step 7 In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to alter or execute a stored procedure.

Figure 4-56 Switching to the database where you want to alter or execute a stored procedure



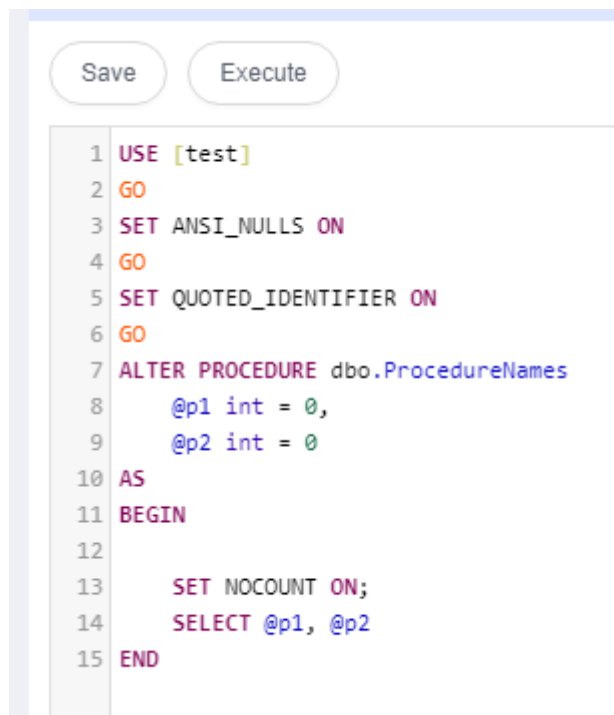
Step 8 On the displayed **Objects** page, choose **Stored Procedures**. In the right pane, locate the stored procedure you want to alter or execute and click **Alter or Execute** in the **Operation** column.

Figure 4-57 Altering or executing a stored procedure



Step 9 On the displayed page, edit the content and click **Save**.

Figure 4-58 Saving the change



Step 10 In the displayed dialog box, set input parameters and click **Execute**.

Figure 4-59 Executing

Set Input Paramter ×

	Parameter	Data Type	Output parameter	Transmit null	Parameter Value
1	@p1	int	IN	<input type="checkbox"/>	<input type="text"/>
2	@p2	int	IN	<input type="checkbox"/>	<input type="text"/>

Step 11 View the execution status in the **Message** area.

----End

4.6.3 Dropping a Stored Procedure

This section describes how to drop a stored procedure that is no longer needed.


Precautions

Dropped stored procedures cannot be recovered. Exercise caution when performing this operation.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

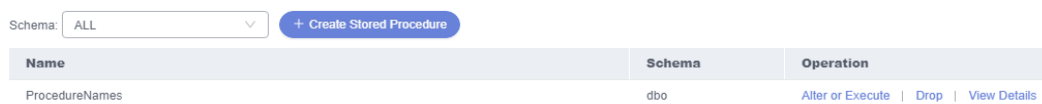
Step 7 In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to delete a stored procedure.

Figure 4-60 Switching to the database where you want to delete a stored procedure



- Step 8** On the displayed **Objects** page, choose **Stored Procedures**. In the right pane, locate the stored procedure you want to drop and click **Drop** in the **Operation** column.

Figure 4-61 Dropping a stored procedure





- Step 9** In the displayed dialog box, click **Yes**.
----End

4.6.4 Viewing Details of a Stored Procedure

This section describes how to view details of a stored procedure on the DAS console. The details show the SQL statement for creating this stored procedure.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.

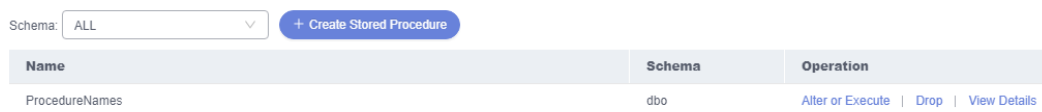
- Step 7** In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to view details of a stored procedure.

Figure 4-62 Switching to the database where you want to view details of a stored procedure



- Step 8** On the displayed **Objects** page, choose **Stored Procedures**. In the right pane, locate the stored procedure you want to view and click **View Details** in the **Operation** column.

Figure 4-63 Viewing details of a stored procedure





- Step 9** In the displayed dialog box, view the stored procedure details.
----End

4.7 Trigger Management

4.7.1 Creating a Trigger

This section describes how to create a trigger on the DAS console. A trigger is a set of SQL statements stored in the database catalog. Whenever an event associated with a table occurs, a SQL trigger is executed or fired to insert, update, or delete data.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

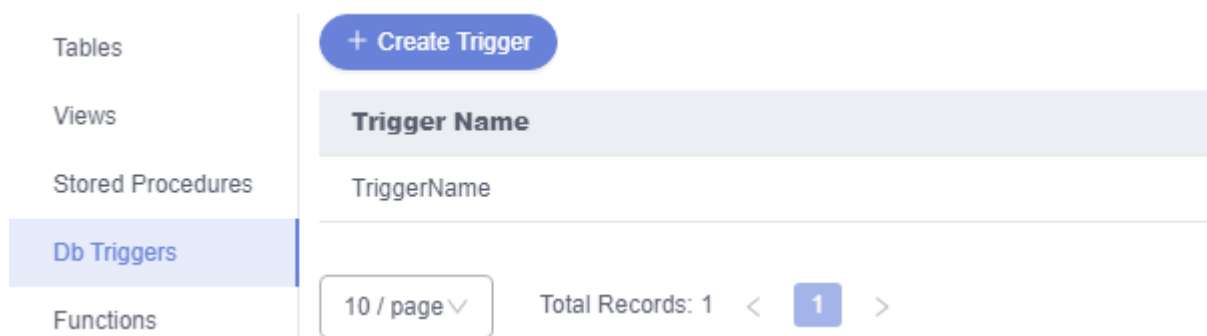
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to create a trigger.

Figure 4-64 Switching to the database where you want to create a trigger

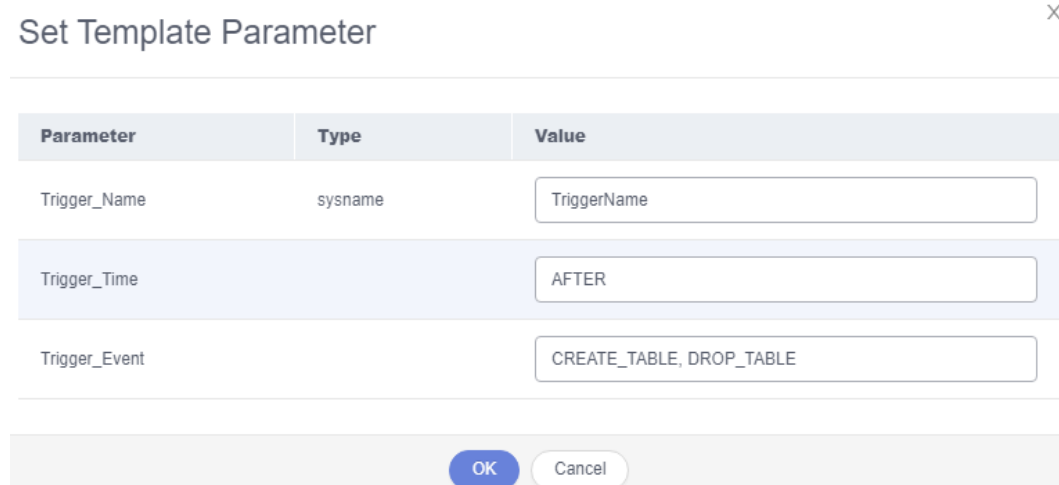


- Step 8** On the displayed **Objects** page, choose **Db Triggers**. In the upper left corner of the page, click **Create Trigger**.

Figure 4-65 Creating a trigger



- Step 9** On the displayed page, click **Set Template Parameter**.
- Step 10** In the displayed dialog box, set parameters and click **OK**.

Figure 4-66 Setting template parameters

Parameter	Type	Value
Trigger_Name	sysname	TriggerName
Trigger_Time		AFTER
Trigger_Event		CREATE_TABLE, DROP_TABLE

Step 11 Edit the content and click **Save**.

----End

4.7.2 Altering a Trigger

This section describes how to alter the name, table, condition, and event of a trigger as well as the SQL statement for defining the trigger on the DAS console.

Usage Notes

Improper alterations on a trigger will cause instance or service exceptions.

Procedure



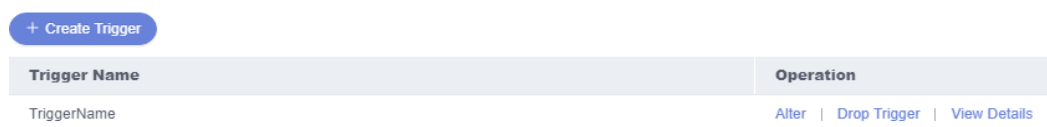
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to alter a trigger.

Figure 4-67 Switching to the database where you want to alter a trigger

Step 8 On the displayed **Objects** page, select **Db Triggers**. In the right pane, locate the trigger you want to alter and click **Alter** in the **Operation** column.

Figure 4-68 Altering a trigger

Step 9 On the displayed page, edit the content and click **Save**.

----End



4.7.3 Dropping a Trigger

This section describes how to drop a trigger that is no longer needed.

Usage Notes

Dropped triggers cannot be recovered. Exercise caution when performing this operation.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

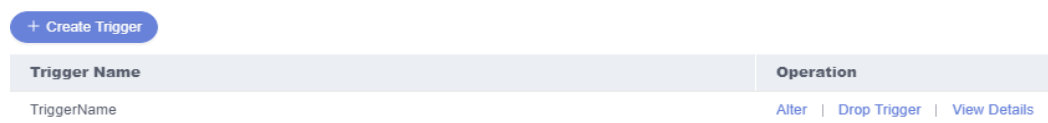
Step 7 In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to delete a trigger.

Figure 4-69 Switching to the database where you want to delete a trigger



Step 8 On the displayed **Objects** page, select **Db Triggers**. In the right pane, locate the trigger you want to drop and click **Drop Trigger** in the **Operation** column.

Figure 4-70 Dropping a trigger



Step 9 In the displayed dialog box, click **Yes**.

----End


4.7.4 Viewing Details of a Trigger

This section describes how to view details of a trigger on the DAS console. The details show the SQL content for creating the trigger.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to view details of a trigger.

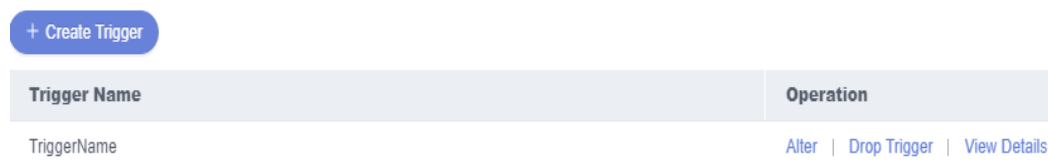
Figure 4-71 Switching to the database where you want to view details of a trigger



Step 8 On the **Objects** tab page, choose **Triggers**.

Step 9 Locate the trigger whose details you want to view and click **View Details** in the **Operation** column.

Figure 4-72 Viewing details of a trigger



Step 10 In the displayed dialog box, view the SQL statement for creating the trigger.

----End

4.8 Function Management

4.8.1 Creating a Function

Functions can improve modularity of applications and code reusability. This section describes how to create a function on the DAS console.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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


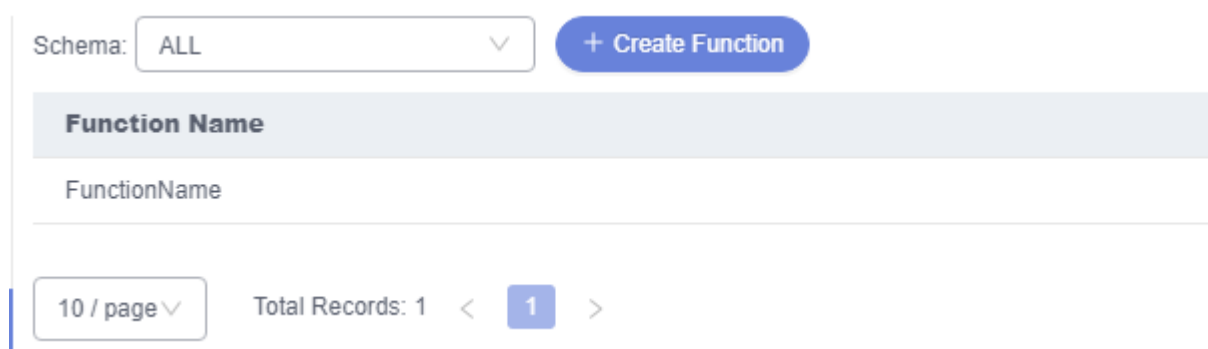
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to create a function.

Figure 4-73 Switching to the database where you want to create a function



- Step 8** On the displayed **Objects** page, select **Functions**, select a schema, and click **Create Function**.

Figure 4-74 Creating a function



- Step 9** In the displayed dialog box, select a function type and click **OK**.

Figure 4-75 Creating a function

Create Function

Function Type:

- Inline table-valued function
- Multi-statement table-valued function
- Scalar function

OK Cancel

Step 10 On the displayed page, click **Set Template Parameter**. In the displayed dialog box, set parameters as required and click **OK**.

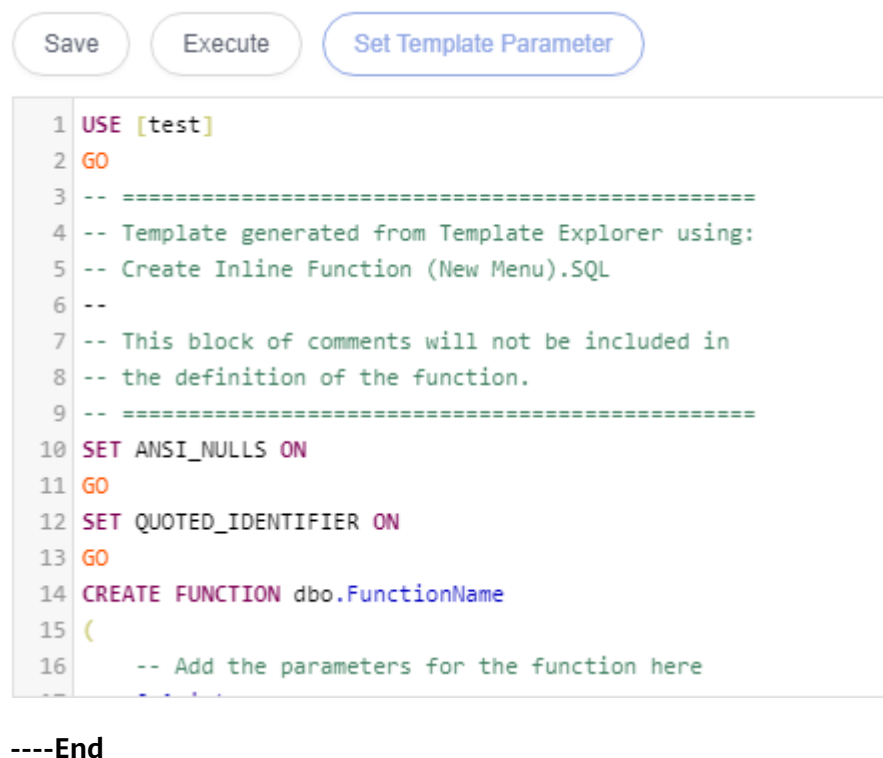
Figure 4-76 Setting template parameters

Set Template Parameter

Parameter	Type	Value
Schema_Name	sysname	dbo
Inline_Function_Name	sysname	FunctionName
@param1	sysname	@p1
Data_Type_For_Param1		int
@param2	sysname	@p2
Data_Type_For_Param2		char

OK Cancel

Step 11 Click **Save** to complete the creation, or click **Execute** to invoke the function and view the result in the **Message** area.

Figure 4-77 Saving function configuration

4.8.2 Altering or Executing a Function

This section describes how to alter or execute a function on the DAS console.

Usage Notes

Improper alterations on a function will cause instance or service exceptions.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to alter or execute a function.

Figure 4-78 Switching to the database where you want to alter or execute a function



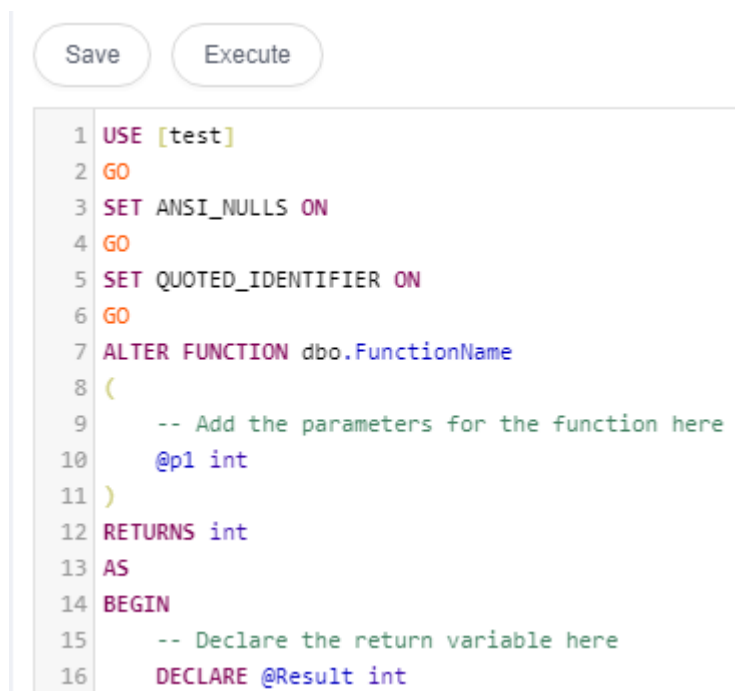
Step 8 On the **Objects** page, select **Functions**. In the right pane, locate the function you want to alter or execute and click **Alter or Execute** in the **Operation** column.

Figure 4-79 Altering or executing a function



Step 9 On the displayed page, modify the content as required. Then, click **Save** to complete the modification, or click **Execute** to invoke the function.

Figure 4-80 Saving a function



Step 10 View the execution result.

----End

4.8.3 Dropping a Function

This section describes how to drop a function that is no longer needed.

Usage Notes

Dropped functions cannot be recovered. Exercise caution when performing this operation.

Procedure



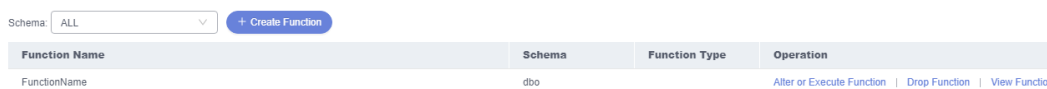
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to delete a function.

Figure 4-81 Switching to the database where you want to delete a function



- Step 8** On the **Objects** page, select **Functions**. In the right pane, locate the function you want to drop and click **Drop** in the **Operation** column.

Figure 4-82 Dropping a function

Step 9 In the displayed dialog box, click **Yes**.

----End


4.8.4 Viewing Details of a Function

This section describes how to view details of a function on the DAS console. The details show the SQL statement for creating the function.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

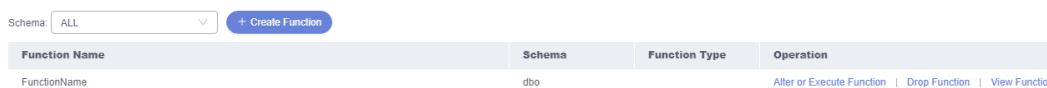
Step 6 On the top menu bar, choose **Database Management**.

Step 7 In the upper area of the page, click **Change** on the right of the current database to switch to the database where you want to view details of a function.

Figure 4-83 Switching to the database where you want to view details of a function



Step 8 On the **Objects** page, select **Functions**. In the right pane, locate the function you want to view and click **View Function** in the **Operation** column.

Figure 4-84 Viewing details of a function

Step 9 In the displayed dialog box, view the function details.

----End

4.9 Data Import and Export

4.9.1 Importing Data

This section describes how to import data from your local PC or an OBS bucket for data backup and migration.


Usage Notes

- Import data into a table for backup or migration. If you import a CSV or SQL file, the file must have the same data type as the target table.
- Only one file that is no larger than 1 GB can be imported at a time.
- Only data files in the CSV or SQL format can be imported. If the number of instance tables exceeds 10,000, the CSV format cannot be used.
- Binary fields such as BINARY, VARBINARY, TINYBLOB, BLOB, MEDIUMBLOB, and LONGBLOB are not supported.
- The size of a single SQL statement to be imported must be less than 100 MB.
- Only OBS buckets of the current IAM account can be imported.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Import**.

Step 7 Click **Create Task**.

Figure 4-85 Creating an import task

Create Task
×

Import Type

sql
CSV

File Source

Upload file
Choose from OBS

Attachment Storage ?

5257 v

Bucket ACL Info

No OBS bucket? [Create OBS Bucket](#)

Creating an OBS bucket is free of charge, but storing files in it will incur fees.

+
 Click here to upload a file, or drag one here. (.sql)

Upload only one attachment that is no larger than 1 GB.

Database

prd v

Charset

UTF8
GBK
Auto Detectct

Options

Ignore errors, that is, skip the step where the SQL statement fails to be executed.
 Delete the uploaded file upon an import success.

Remarks

Create
Cancel

Table 4-9 Parameter description

Parameter	Description
Import Type	Set Import Type to sql or CSV .

Parameter	Description
File Source	<p>Import a file from your local PC or an OBS bucket.</p> <ul style="list-style-type: none">• Upload file If you select Upload file for File Source, you need to set Attachment Storage and upload the required file. To keep your data secure, provide your own OBS bucket to store the file you uploaded. In this way, DAS automatically connects to your OBS bucket for in-memory reading. No data is stored on DAS. Creating OBS buckets is free of charge, but saving files will incur certain costs. If you select Delete the uploaded file upon an import success, the file you uploaded will be automatically deleted from the OBS bucket after being imported to the destination database.• Choose from OBS If you select Choose from OBS for File Source, you need to select a file from the bucket. The file uploaded from an OBS bucket will not be deleted upon an import success.
Attachment Storage	<p>Select an OBS bucket to store the file. Click Bucket ACL Info to check whether a public OBS bucket is selected.</p> <ul style="list-style-type: none">• SAFE: The bucket ACL permission set does not contain ALL USERS.• WARN: The bucket ACL permission set contains ALL USERS.• UNKNOWN: The bucket ACL permission set is unknown, maybe due to the lack of IAM permissions. You are advised to go to the OBS page to view the bucket ACL configuration.
Database	Select the database that you want to import the file to.
Charset	Select a charset as needed.
Options	<p>If you select Ignore errors, that is, skip the step where the SQL statement fails to be executed, the system will skip any errors detected when SQL statements are being executed.</p> <p>If you select Delete the uploaded file upon an import success, the file you uploaded will be automatically deleted from the OBS bucket after being imported to the destination database. This option is only available to the files uploaded from your local PC.</p>
Remarks	Enter remarks as required.

Step 8 After setting import parameters, click **Create**.

Confirm the information again before you click **OK** because original data may be overwritten after data import.

Step 9 On the displayed page, view import progress in the task list.

Click **Details** in the **Operation** column to view task details.

----End

4.9.2 Exporting Data

DAS allows you to export a large amount of data at a time to facilitate data query or to back up data for migration. This section describes how to export data.

DAS allows you to export an entire database, some data tables, or result sets of SQL statements.


Usage Notes

- If you do not select **Generate a file for each table** when exporting data, the exported data file is in **.zip** format. Data files in this format cannot be directly imported. You need to decompress the file before importing it again.
- If **Generate a file for each table** is selected during data export, the exported data file is in **.sql** or **.csv** format. In this case, the exported data file can be directly imported again.
- To export over 10,000 tables of RDS for SQL Server instances, [export SQL results](#) instead of [exporting a database](#).
- Only OBS buckets of the current IAM account can be exported.

Exporting a Database

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

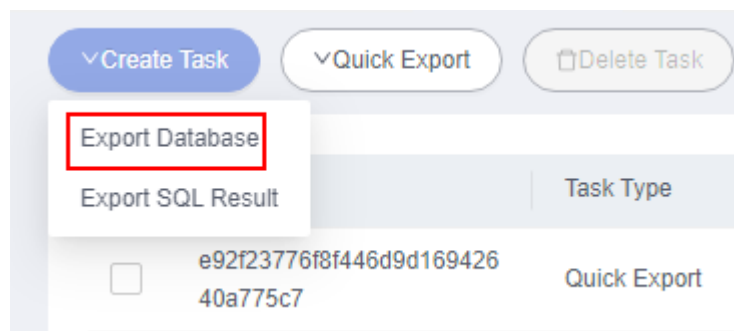
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export** > **Export**.

Step 7 In the upper left corner of the page, click **Create Task** and choose **Export Database**.

Figure 4-86 Creating a task for exporting a database



Step 8 In the displayed dialog box, configure basic information and advanced settings as required.

Figure 4-87 Creating a task for exporting a database

Export Database

Basic Information

Database: db_test Export all tables Export from standby database

Allowed Rows: 10,000

File Type: SQL CSV

Object to Export: Data Structure Data and structure

Charset: UTF8 GBK

Storage: acasc No OBS bucket? Create OBS Bucket

Options: Combine INSERT statements. (Combine INSERT statements into files, with each file smaller than 5 MB.) Generate a file for each table. (Downloading table files in the details slows down the export.)

Remarks

Advanced Settings

Tables

Selected Tables: 0 Enter a table name.

Table Name	Column	WHERE Clause
test_tb	Edit	Edit

10 / page Total Records: 1

OK Cancel

- If you select **Export all tables**, data in an entire database or in specific tables will be exported.
- Databases are classified into user databases and system databases. System database cannot be exported. If system database data is required, deploy system database services in a user database, so that you can export the system database data from the user database.
- DAS connects to your standby database to export data. This prevents the primary database from being affected by data export. However, if the standby database has a high replication delay, the exported data may not be the latest.
- DAS does not store any user data. The exported data files are stored in the OBS bucket that you have created. You can specify the storage path. You can click **Bucket ACL Info** in the **Create Task** dialog box to check whether a public OBS bucket is selected.
- Creating OBS buckets is free of charge, but saving files will incur certain costs.

Step 9 After settings are complete, click **OK**.

Step 10 In the task list, locate the created task and view the task ID, type, status, and progress.

Step 11 Click **Details** in the **Operation** column to view task details.

Figure 4-88 Task list

Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
4c341463a2c146a7b20584c430200140	Database	db_test	2023-07-14 10:42:10	2023-07-14 10:42:11	260.89 KB	SQL	Successful	1 second	10000	100%		Details Download
e92c23778914469d16942640a775c7	Quick Export	db_test	2023-07-14 10:39:20	2023-07-14 10:39:21	1.61 MB	SQL	Successful	1 second	100000	100%		Details Download

----End

Exporting SQL Results



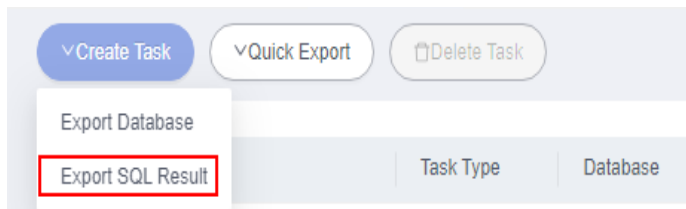
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Import and Export > Export**.
- Step 7** In the upper left corner of the page, click **Create Task** and choose **Export SQL Result**.

Figure 4-89 Creating a task for exporting SQL results



- Step 8** In the displayed dialog box, configure basic information and advanced settings as required.

Figure 4-90 Creating a task for exporting SQL results

Export SQL Result X

Basic Information

Database: Export from standby database ?

Allowed Rows:

File Type:

Charset:

Storage ?: No OBS bucket? [Create Bucket](#)

Creating an OBS bucket is free of charge, but storing files in it will incur fees.

Options

Combine INSERT statements. (Combine INSERT statements into files, with each file smaller than 5 MB.)

Generate one file for each result.

SQL to Execute:

Remarks:

Advanced Settings ∨

- In a SQL result export task, the executed SQL statements cannot exceed 5 MB.
- To export multiple SQL result sets at a time, enter SQL statements in the SQL text box. Enter each SQL statement on a separate line and add a semicolon (;) at the end. After the export task is complete, SQL files are generated. One SQL statement corresponds to one file.
- DAS does not store any user data. The exported data files are stored in the OBS bucket that you have created.
- You can click **Bucket ACL Info** in the **Create Task** dialog box to check whether a public OBS bucket is selected.
- Creating OBS buckets is free of charge, but saving files will incur certain costs.

Step 9 After settings are complete, click **OK**.

Step 10 In the task list, locate the created task and view the task ID, type, status, and progress.

Step 11 Click **Details** in the **Operation** column to view task details.

Figure 4-91 Task list

Task ID	Task Type	Database	Start	End	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
0f0c17f020b84b3d0551107791404040	SQL Backup	db_test	2023-07-14 10:4 8:30	2023-07-14 10:4 8:30	200.84 KB	SQL Backup	Successful	1 second	10000	100%		Details Download
41c41184382183472018414430201843	Database	db_test	2023-07-14 10:4 2:30	2023-07-14 10:4 2:31	200.89 KB	SQL	Successful	1 second	10000	100%		Details Download
40212770844000108420400108420400108420	Quick Export	db_test	2023-07-14 10:3 8:20	2023-07-14 10:3 8:21	1.41 MB	SQL	Successful	1 second	100000	100%		Details Download

----End

Downloading Data Files


Data exported using the data export function is stored in the OBS bucket you created. You can download exported data files in any of the following ways:

- Download on the DAS Console.
- Download on the OBS management console.

Quick Export (Not Promoted)

Step 1 Log in to the Huawei Cloud console.

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

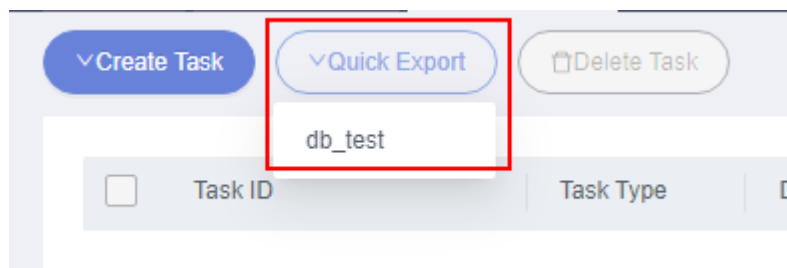
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

Step 7 In the upper left corner of the page, click **Quick Export** and select the database that you want to export data from.

Figure 4-92 Quick export

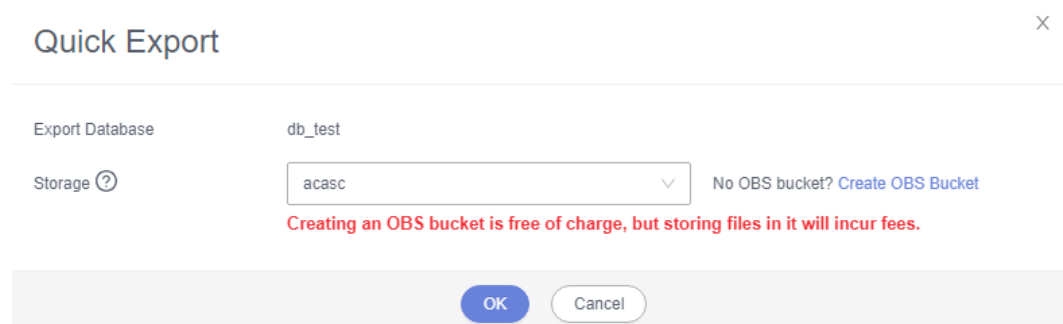


NOTE

A maximum of 200,000 rows can be quickly exported from a single table. To export more data, choose **Create Task > Export Database**.

Step 8 On the **Quick Export** page, select a storage path and click **OK**.

Figure 4-93 Quick export



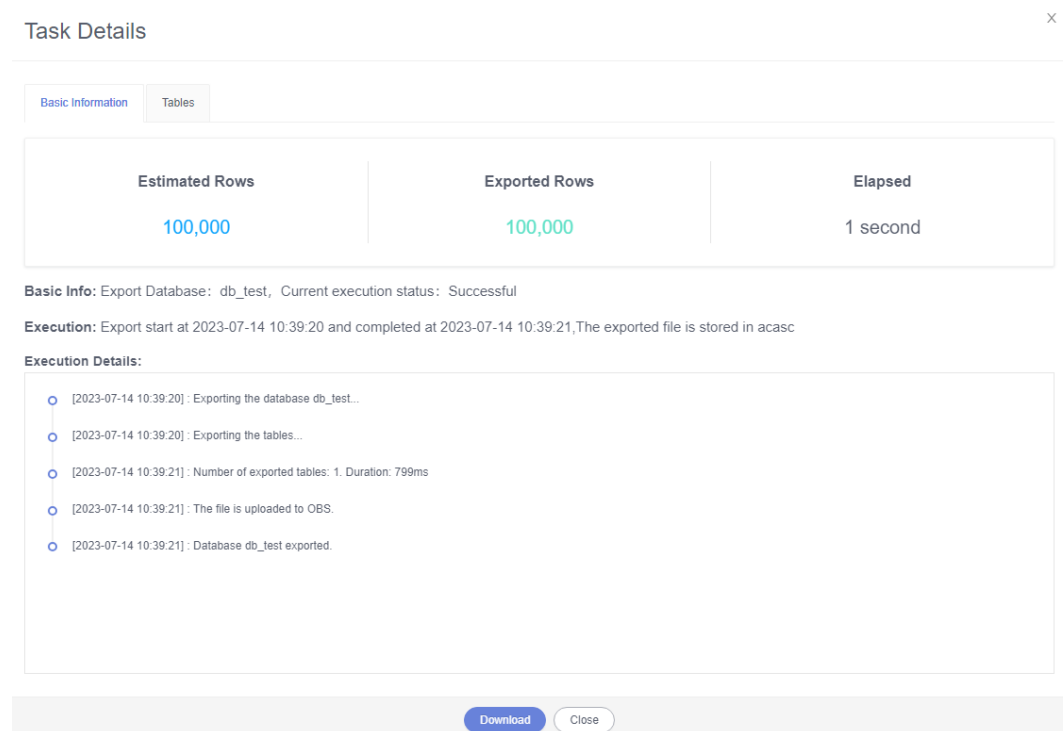
Step 9 In the task list, view the export task you created.

Figure 4-94 Task list

Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
69223775844692169426 42a776c7	Quick Export	db_test	2023-07-14 10:3 9:20	2023-07-14 10:3 9:21	1.61 MB	SQL	Successful	1 second	100000	100%		Details Download

In the row that contains the export task, you can click **Details** in the **Operation** column to view execution details of the task and information about exported tables.

Figure 4-95 Task details



----End

5 PostgreSQL

5.1 Account Management

5.1.1 Role Management

This section describes how to create one or more roles and grant different permissions to each role.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > Role Management**.
- Step 7** On the role management page, click **Create Role** in the upper left corner.
- Step 8** On the **Basic Settings** tab page, enter a role name (mandatory) and specify other parameters as required.

Figure 5-1 Creating a role

The screenshot shows the 'Basic Settings' tab for creating a role. The form contains the following fields and options:

- * Role Name**: A text input field.
- Login**: A checkbox.
- Password**: A text input field with a copy icon.
- Confirm Password**: A text input field with a copy icon.
- Connection Limit**: A text input field with a help icon.
- Expires**: A date picker with the text 'Select a date.' and a calendar icon.
- Create Database**: A checkbox.
- Create Role**: A checkbox.
- Inherit Permission**: A checkbox with a help icon.

- Step 9** (Optional) On the **Role Groups** tab page, select the check boxes in columns **Grant** and **With Grant Option** as needed.
- Step 10** (Optional) On the **Permissions** tab page, click **Add**, specify a resource type, database, schema, and other column settings from the drop-down lists.
- Step 11** Click **Save**. In the displayed **SQL Preview** dialog box, click **OK**.
- Step 12** On the role management page, edit, rename, and delete existing roles as required.



----End

5.2 Database Management

5.2.1 Creating a Database

This section describes how to create a database on the DAS console.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
- You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 In the database list of the **Home** page, click **Create Database**.

Figure 5-2 Creating a database

Database List

[+ Create Database](#) User database ▾

Database Name	Table Quantity	Table Size	Index Size	Character Set	Operation
console	2	16KB	32KB	UTF8	Manage Query SQL Statements Delete
postgres	--	--	--	UTF8	Manage Query SQL Statements Delete
test_yrb	--	--	--	UTF8	Manage Query SQL Statements Delete

Step 7 In the displayed dialog box, enter a database name, select a character set, and configure other parameters as required.

Figure 5-3 Creating a database

Create Database ✕

*** Name** ?

Only user databases can be created

Character Set

Template ?

Collation ?

Ctype ?

Owner ?

NOTE

You can execute the following SQL statement to query system table **pg_collation** and view the character set and its corresponding collation and character type as follows:

```
select pg_encoding_to_char(collencoding) as encoding,collname,collcollate,collctype from pg_collation ;
```

Step 8 Click **OK**. View the created database in the database list.

----End

5.2.2 Deleting a Database

This section describes how to drop a database that is no longer needed.

Precautions

Dropped databases cannot be recovered. Exercise caution when performing this operation.

Procedure



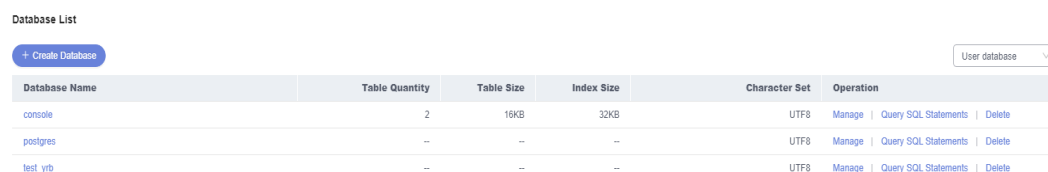
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** In the database list, locate the database you want to delete and click **Delete** in the **Operation** column.

Figure 5-4 Deleting a database



Database Name	Table Quantity	Table Size	Index Size	Character Set	Operation
console	2	16KB	32KB	UTF8	Manage Query SQL Statements Delete
postgres	--	--	--	UTF8	Manage Query SQL Statements Delete
test_yrb	--	--	--	UTF8	Manage Query SQL Statements Delete

- Step 7** In the displayed dialog box, click **Yes**.

----End

5.3 SQL Operations

5.3.1 SQL Window

DAS allows you to run various SQL statements in the graphical SQL window, helping you easily manage databases.

Introduction to SQL Window

Figure 5-5 SQL Window

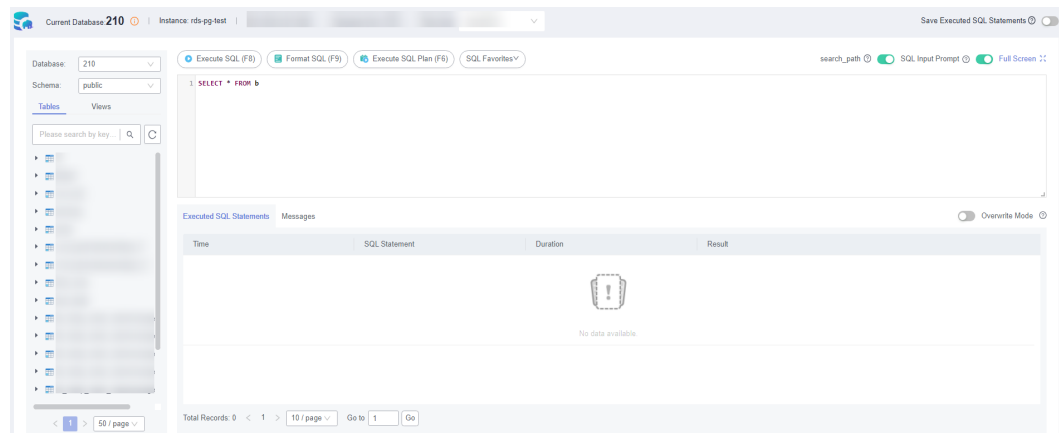




Table 5-1 Function description

Function	Description
Execute SQL	Executes SQL statements. SQL operations are performed on tables and views in a database.
Format SQL	Improves readability of SQL statements. Formatting SQL statements enables statements to be displayed in line break mode, but does not change their logics and semantics. SQL formatting takes effect for all the SQL statements in the SQL window. You cannot format only one selected statement.
Executing SQL Plan	Reports execution of SQL statements to make troubleshooting easy and optimize SQL processing performance.
SQL Favorites	Allows you to add, view, and manage frequently-used SQL statements.
Save Executed SQL Statements	Saves the recently executed SQL statements to the server.
SQL Input Prompt	Helps you quickly enter a specific database, table, or field name when you enter a SQL statement in the SQL window.
Full Screen	Shows SQL statements on a full screen.
Show Executed SQL Statements	Shows SQL execution details.
Messages	Shows the information returned after a SQL statement is executed.

Function	Description
Result Set	Shows SQL execution results. Allows you to view details about a single row, add a row, submit for editing, delete a row, export a row, copy a row, copy a column, set a column, and more.
Overwrite/ Append Mode	<ul style="list-style-type: none">• Append Mode: Each time a SQL statement is executed, the new result set is appended to the previous one.• Overwrite Mode: Each time a SQL statement is executed, the new result set overwrites the previous one.



Opening the SQL Window

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- End

5.3.2 Executing SQL Statements

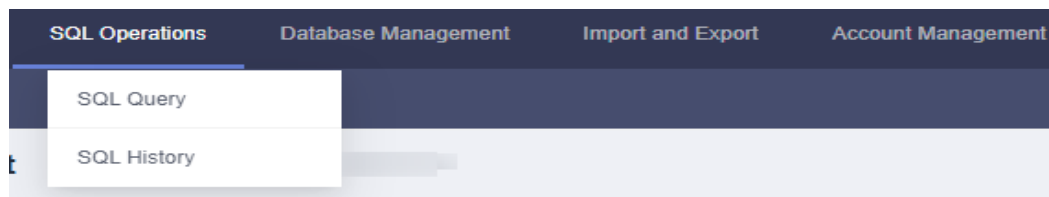
This section describes how to execute various SQL statements.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

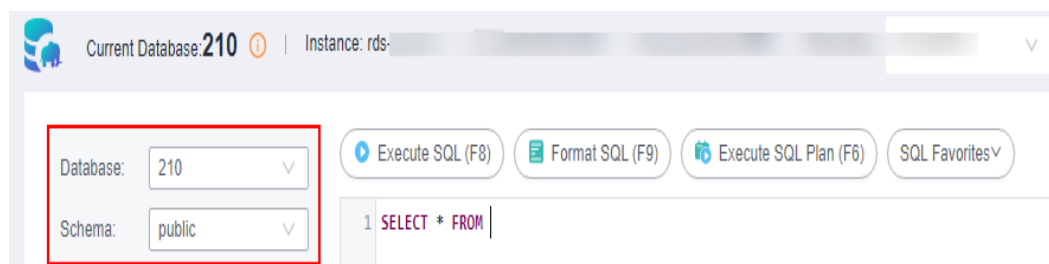
Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

Figure 5-6 Opening the SQL window



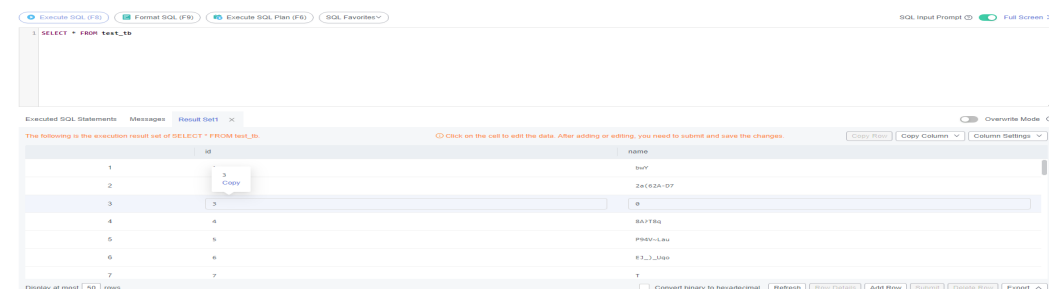
Step 7 In the upper left corner of the page, select a database and schema.

Figure 5-7 Selecting a database



Step 8 Enter a SQL statement in the SQL window and click **Execute SQL**.

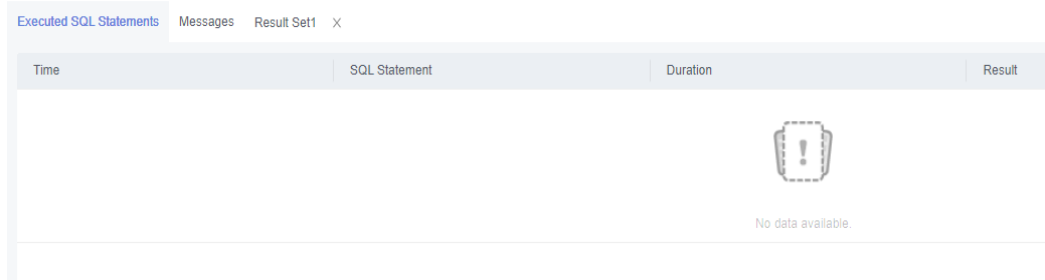
Figure 5-8 Executing a SQL Statement



- Enabling **SQL Input Prompt** is recommended. It helps you select the required database, table, or field name when you enter a SQL statement in the SQL window.
- To protect query result sets from being displayed as garbled characters, select an encoding format other than the default encoding format, UTF-8.
- You can execute multiple SQL statements at a time. Separate them using semicolons (;). You can click **Full Screen** to view logics in SQL statements clearly.
 - To execute some of the SQL statements, select the statements before executing them.
 - To execute all SQL statements, do not select any SQL statements or select all SQL statements.

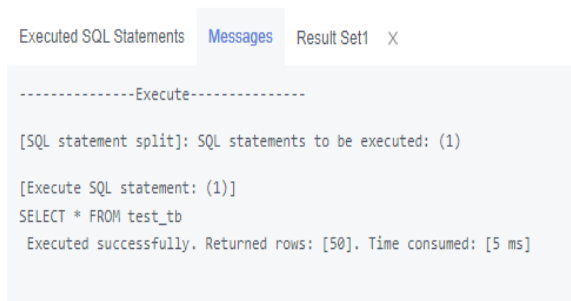
Step 9 View execution details of the current SQL statement and previously executed SQL statements in the lower part of the page.

Figure 5-9 Viewing execution records



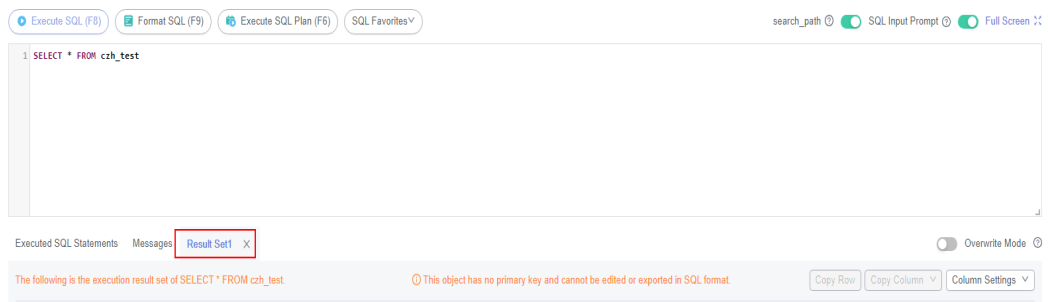
Step 10 Click the **Messages** tab, view SQL execution details, including affected rows, progress, and time required.

Figure 5-10 Viewing messages



Step 11 On the **Result Set** tab, view SQL execution results.

Figure 5-11 Viewing result sets



You can also perform the operations described in [Table 5-2](#) on result sets.

Table 5-2 Operations

Function	Description
Copy Row and Copy Column	Copies a row or column for reuse.
Column Settings	Customizes the display of columns when there are a number of columns in the query result.

Function	Description
Convert binary to hexadecimal	Converts binary data in the result set into hexadecimal data for display.
Refresh	Refreshes changed data.
Row Details	Displays the column field name, type, and data of the selected row.
Add Row	Adds an empty row to the result set.
Submit	Views the SQL statements to be modified. After you click OK , the result set is updated.
Delete Row	Deletes the selected row, including data.
Export	The SQL, CSV, and Excel files are supported. No more than 7.84 MB of data with 10,000 records can be exported. The actual size of an Excel file may exceed 7.84 MB due to its format.
Export More	Redirects you to the data export page and allows you to export over 10,000 rows of data.

 **NOTE**

- If the result set involves a view, data in the result set cannot be edited.
- If the type of the result set is metadata, the data cannot be edited or displayed on multiple pages.
- If the result set involves multiple tables, data in the result set cannot be edited.
- If only one table is in the result set and does not contain all primary key columns or any primary keys, you cannot edit the data.
- Data in virtual tables (for example, tables generated during execution of a stored procedure) cannot be edited.

----End


5.3.3 Executing SQL Plan

This section describes how to analyze the execution efficiency of a SQL statement.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

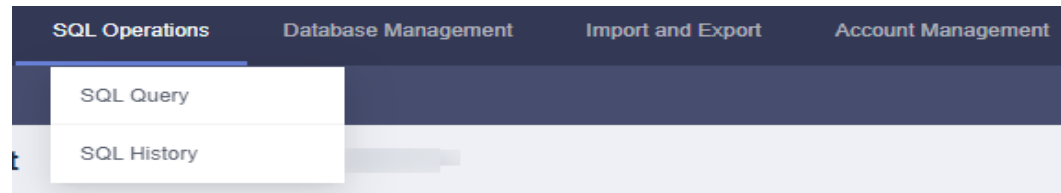
Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

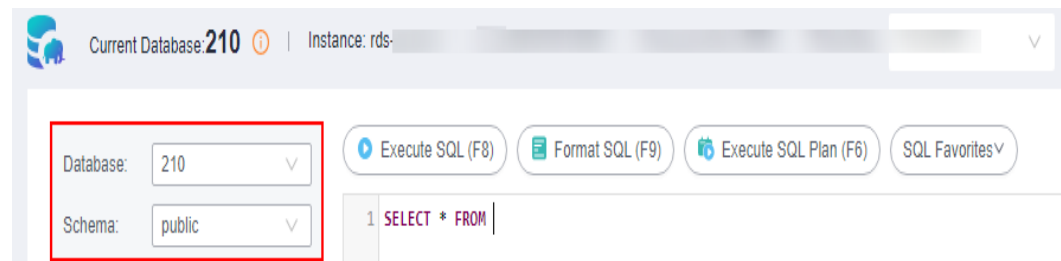
Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

Figure 5-12 Opening the SQL window



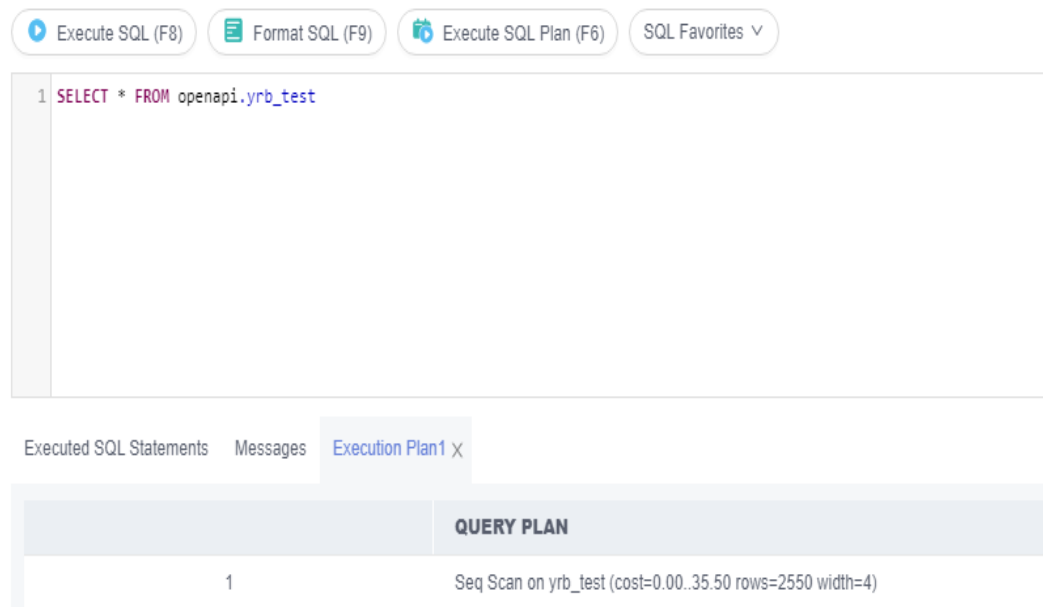
Step 7 In the upper left corner of the page, select a database and schema.

Figure 5-13 Selecting a database



Step 8 Enter a SQL statement in the SQL window and click **Execute SQL Plan**.

Figure 5-14 Executing SQL plan



- On the **Executed SQL Statements** tab page, view SQL execution history.
- On the **Messages** tab page, view execution information, including SQL splitting, execution status, and elapsed time.

- On the **Execution Plan** tab page, view SQL execution details. Execution plan details of SQL statements are displayed on different tabs.

----End

5.3.4 SQL Favorites

This section describes how to add frequently-used SQL statements and view and manage them.

Procedure



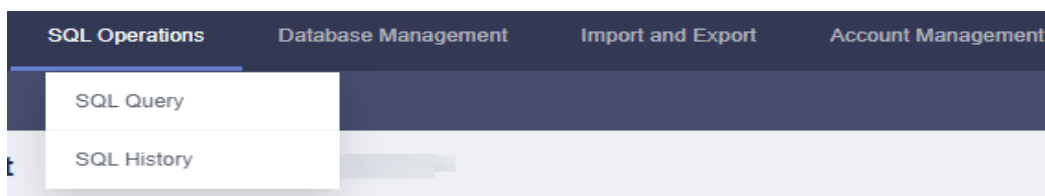
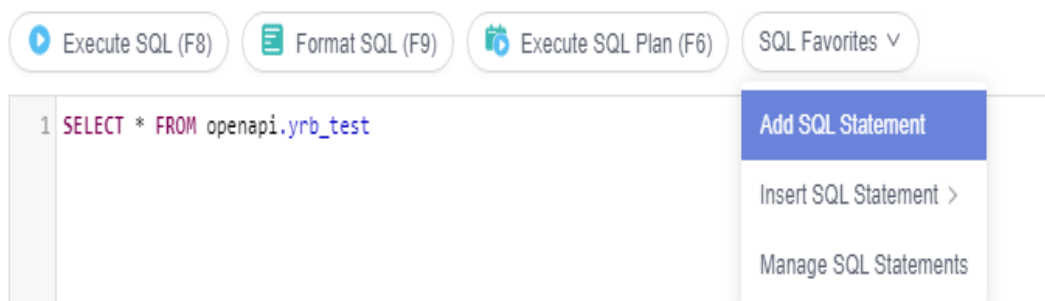
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.

Figure 5-15 Opening the SQL window



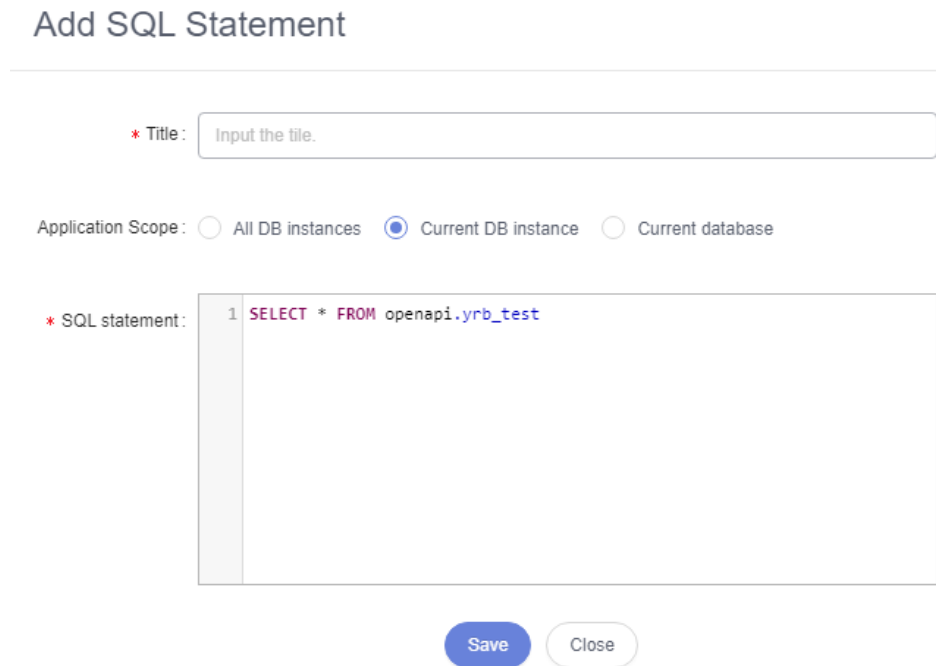
- Step 7** In the SQL window, click **SQL Favorites**.

Figure 5-16 SQL Favorites



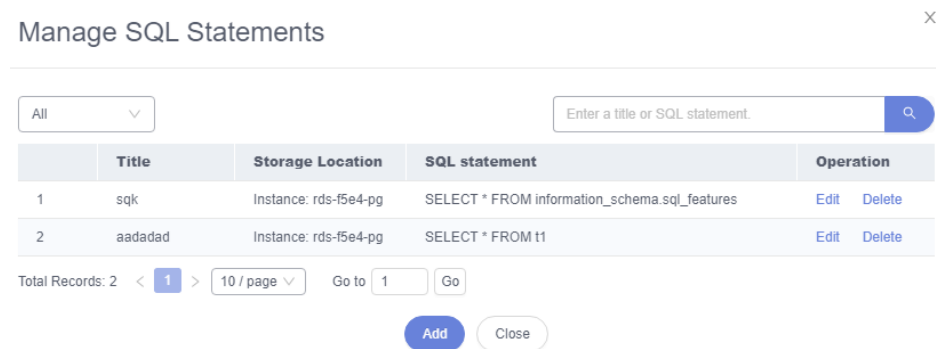
- **Add SQL Statement:** allows you to add frequently-used SQL statements. Specifically, specify a title, select an application scope, enter SQL statements, and then click **Save**.

Figure 5-17 Adding a SQL statement



- **Insert SQL Statement:** allows you to view the SQL statements you have added. If there are no SQL statements stored in your account, this option will not be displayed.
- **Manage SQL Statements:** allows you to manage frequently-used SQL statements, including adding, editing, and deleting statements.

Figure 5-18 Managing SQL statements



----End

5.3.5 SQL History

After you toggle on **Save Executed SQL Statements**, DAS will save the SQL statements you executed in the SQL window for future view. You can also execute the SQL statements again with no need to enter them again in the SQL window.

Prerequisites

You have enabled **Save Executed SQL Statements** in the upper right corner of the **SQL Query** page. After this function is enabled, executed SQL statements will be saved on the DAS management host.

Constraints on Usage

SQL statement execution records can be stored for up to one year.

Procedure



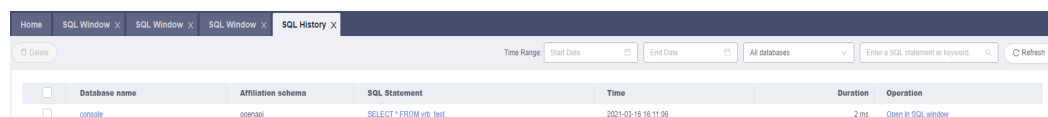
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL History**.
- Step 7** On the displayed page, search for execution information about the target SQL statement by time range, database name, or keyword.

Figure 5-19 SQL history



Database name	Affiliation schema	SQL Statement	Time	Duration	Operation
console	opensgi	SELECT * FROM ytb_test	2021-03-16 16:11:06	2 ms	Open in SQL window

- To access the **Database Management** page, click a database name.
- To copy a SQL statement, click it in the **SQL Statement** column.
- To execute a SQL statement, click **Open in SQL window** in the **Operation** column.

----End

5.4 Table Management

5.4.1 Opening a Table

The graphical window for creating a PostgreSQL database table is not available. To create a table, execute SQL statements in the SQL window. For details, see [SQL Query](#).

After a table is created, you can open the table on the DAS console and view data in the table.

Usage Notes

Tables in PostgreSQL databases do not have primary keys and their data can only be queried.

Procedure



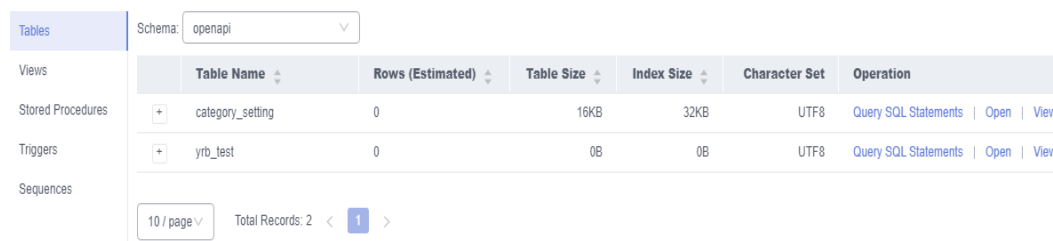
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab, choose **Tables** on the left. In the table list, locate the table you want to open and click **Open** in the **Operation** column.

Figure 5-20 Opening a table

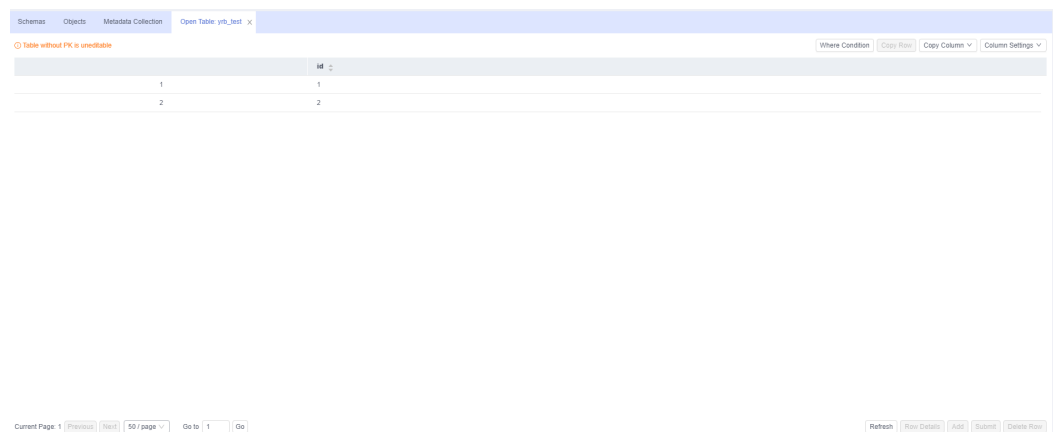


Views	Table Name	Rows (Estimated)	Table Size	Index Size	Character Set	Operation
Stored Procedures	category_setting	0	16KB	32KB	UTF8	Query SQL Statements Open View
Triggers	yrb_test	0	0B	0B	UTF8	Query SQL Statements Open View
Sequences						

10 / page Total Records: 2 < 1 >

- Step 8** On the table details page, specify the rows to be displayed.
You can also copy and reuse rows and columns.

Figure 5-21 Table details



id
1
2

Current Page: 1 | Previous | Next | 50 / page | Go to: 1 | Go

Refresh | Row Details | Add | Submit | Delete Row

Table 5-3 UI operations

Name	Description
Where Condition	Filters records.
Copy Row	Copies data of the selected row. Specifically, double-click the target row and then click Copy Row .
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.
Column Settings	Allows you to set the columns you want to display.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.

----End

5.4.2 Viewing Details of a Table

This section describes how to view basic information of a table.

Procedure



- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab, choose **Tables** on the left. In the right pane, locate the table whose details you want to view and click **View** in the **Operation** column.

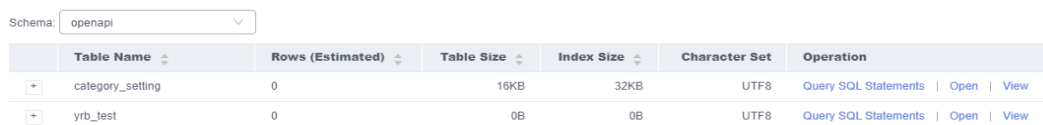
Figure 5-22 Viewing details of a table

Table Name	Rows (Estimated)	Table Size	Index Size	Character Set	Operation
category_setting	0	16KB	32KB	UTF8	Query SQL Statements Open View
yrb_test	0	0B	0B	UTF8	Query SQL Statements Open View

- Step 8** In the displayed dialog box, view basic table information.

----End

5.5 View Management

5.5.1 Opening a View

Views in PostgreSQL databases do not have primary keys and their data can only be queried.

Procedure



- Step 1** Log in to the Huawei Cloud console.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** page, choose **Views**. In the right pane, locate the view that you want to open and click **Open** in the **Operation** column.

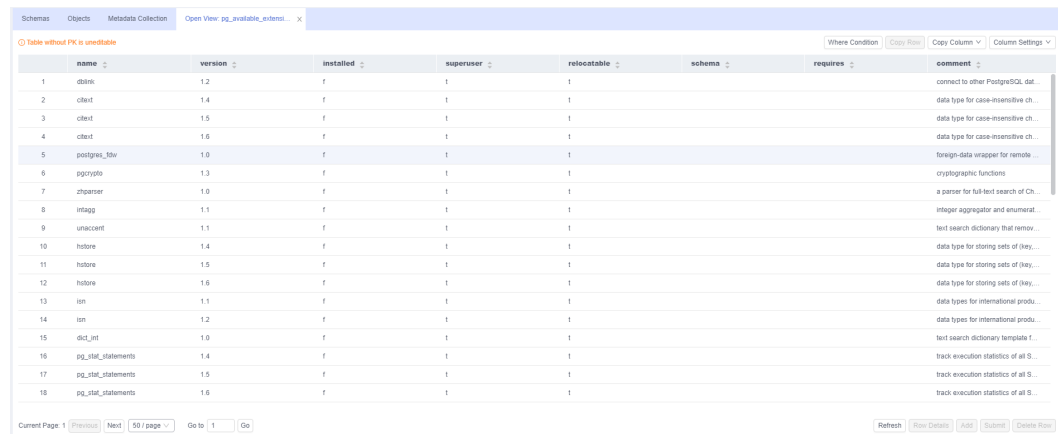
Figure 5-23 Opening a view



View Name	Operation
_pg_foreign_data_wrappers	Open View Details
_pg_foreign_servers	Open View Details
_pg_foreign_table_columns	Open View Details

- Step 8** Check view information on the details page or click **Where Condition**.

Figure 5-24 Viewing details of a view



name	version	installed	superuser	relocatable	schema	requires	comment
obinr	1.2	f	t	t			connect to other PostgreSQL dat...
obint	1.4	f	t	t			data type for case-insensitive ch...
obint	1.5	f	t	t			data type for case-insensitive ch...
obint	1.6	f	t	t			data type for case-insensitive ch...
postgres_fdw	1.0	f	t	t			foreign-data wrapper for remote...
pgcrypto	1.3	f	t	t			cryptographic functions
zhparser	1.0	f	t	t			a parser for full-text search of Ch...
intagg	1.1	f	t	t			integer aggregator and enumerat...
unaccent	1.1	f	t	t			text search dictionary that remov...
hstore	1.4	f	t	t			data type for storing sets of (key...
hstore	1.5	f	t	t			data type for storing sets of (key...
hstore	1.6	f	t	t			data type for storing sets of (key...
iso	1.1	f	t	t			data types for international produ...
iso	1.2	f	t	t			data types for international produ...
dict_int	1.0	f	t	t			text search dictionary template f...
pg_stat_statements	1.4	f	t	t			track-execution statistics of all S...
pg_stat_statements	1.5	f	t	t			track-execution statistics of all S...
pg_stat_statements	1.6	f	t	t			track-execution statistics of all S...

Table 5-4 UI operations

Name	Description
Where Condition	Filters records.
Copy Row	Copies data of the selected row. Specifically, double-click the target row and then click Copy Row .
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.
Column Settings	Allows you to set the columns you want to display.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.

----End

5.5.2 Viewing Details of a View

This section describes how to view details of a view, which show the SQL statement for creating it.

Procedure



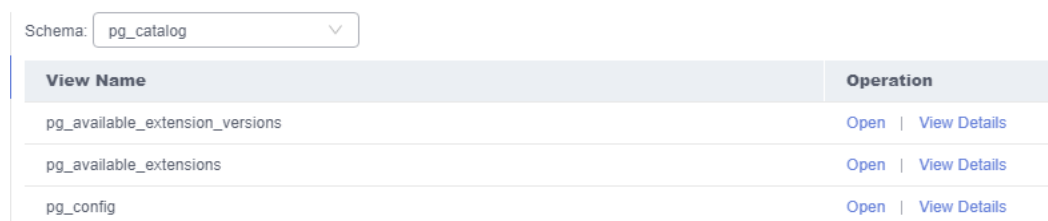
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab, choose **Views** on the left. In the right pane, locate the view whose details you want to view and click **View Details** in the **Operation** column.

Figure 5-25 Viewing details of a view

View Name	Operation
pg_available_extension_versions	Open View Details
pg_available_extensions	Open View Details
pg_config	Open View Details

Step 8 In the displayed dialog box, view the SQL statement used to create the view.

----End

5.6 Stored Procedure Management


5.6.1 Viewing Details of a Stored Procedure

This section describes how to view details of a stored procedure on the DAS console. The details show the SQL statement for creating this stored procedure.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

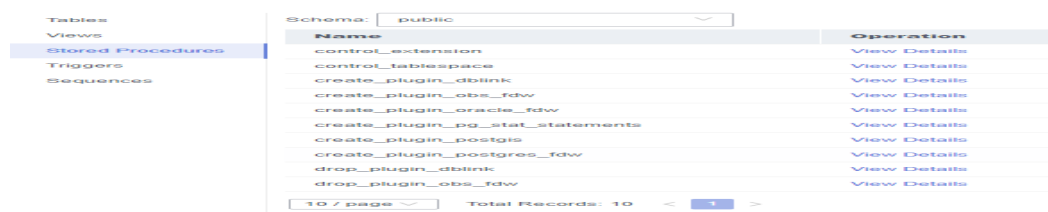
Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 On the **Objects** tab page, choose **Stored Procedures**.

Step 8 Locate the stored procedure whose details you want to view and click **View Details** in the **Operation** column.

Figure 5-26 Viewing details of a stored procedure



Name	Operation
control_extension	View Details
control_tablespace	View Details
create_plugin_dblink	View Details
create_plugin_obs_fdw	View Details
create_plugin_oracle_fdw	View Details
create_plugin_pg_stat_statements	View Details
create_plugin_postgis	View Details
create_plugin_postgres_fdw	View Details
drop_plugin_dblink	View Details
drop_plugin_obs_fdw	View Details

Step 9 In the displayed dialog box, view the SQL statement used to create the stored procedure.



----End

5.7 Trigger Management

5.7.1 Viewing Details of a Trigger

This section describes how to view details of a trigger on the DAS console. The details show the SQL statement for creating the trigger.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
 - Step 2** Click  in the upper left corner and select a region and project.
 - Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
 - Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
 - Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
 - Step 6** On the top menu bar, choose **Database Management**.
 - Step 7** On the **Objects** tab page, choose **Triggers**.
 - Step 8** Locate the trigger whose details you want to view and click **View Details** to view the SQL statement used to create the trigger.
- End

5.8 Sequence Management

5.8.1 Viewing Details of a Sequence

This section describes how to view details of a sequence, which show the SQL statement for creating it.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.

Step 7 On the **Objects** tab page, choose **Sequences**.

Step 8 Locate the sequence whose details you want to view and click **View Details** to view the SQL statement used to create the sequence.

Figure 5-27 Sequence list



Sequence Name	Data Type	Starting Value	Increment	Operation
us_gaz_id_seq	bigint	1	1	View Details
us_lex_id_seq	bigint	1	1	View Details
us_rules_id_seq	bigint	1	1	View Details

----End

5.9 Data Import and Export

5.9.1 Importing Data

This section describes how to import data from your local PC or an OBS bucket for data backup and migration.


Usage Notes

- Import data into a table for backup or migration. If you import a CSV or SQL file, the file must have the same data type as the target table.
- Only one file that is no larger than 1 GB can be imported at a time.
- Only data files in the CSV or SQL format can be imported. If the number of instance tables exceeds 100,000, the CSV format cannot be used.
- Binary fields such as BINARY, VARBINARY, TINYBLOB, BLOB, MEDIUMBLOB, and LONGBLOB are not supported.
- This function is not available to PostgreSQL Enhanced Edition instances.
- The size of a single SQL statement to be imported must be less than 100 MB.
- Only OBS buckets of the current IAM account can be imported.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Import**.

Step 7 Click Create Task.

Figure 5-28 Creating an import task

Table 5-5 Parameter description

Parameter	Description
Import Type	Set Import Type to sql or CSV .

Parameter	Description
File Source	<p>Import a file from your local PC or an OBS bucket.</p> <ul style="list-style-type: none"> Upload file If you select Upload file for File Source, you need to set Attachment Storage and upload the required file. To keep your data secure, provide your own OBS bucket to store the file you uploaded. In this way, DAS automatically connects to your OBS bucket for in-memory reading. No data is stored on DAS. Creating OBS buckets is free of charge, but saving files will incur certain costs. If you select Delete the uploaded file upon an import success, the file you uploaded will be automatically deleted from the OBS bucket after being imported to the destination database. Choose from OBS If you select Choose from OBS for File Source, you need to select a file from the bucket. The file uploaded from an OBS bucket will not be deleted upon an import success.
Attachment Storage	<p>Select an OBS bucket to store the file. Click Bucket ACL Info to check whether a public OBS bucket is selected.</p> <ul style="list-style-type: none"> SAFE: The bucket ACL permission set does not contain ALL USERS. WARN: The bucket ACL permission set contains ALL USERS. UNKNOWN: The bucket ACL permission set is unknown, maybe due to the lack of IAM permissions. You are advised to go to the OBS page to view the bucket ACL configuration.
Database	Select the database that you want to import the file to.
Charset	Select a charset as needed.
Options	<p>If you select Ignore errors, that is, skip the step where the SQL statement fails to be executed, the system will skip any errors detected when SQL statements are being executed.</p> <p>If you select Delete the uploaded file upon an import success, the file you uploaded will be automatically deleted from the OBS bucket after being imported to the destination database. This option is only available to the files uploaded from your local PC.</p>
Remarks	Enter remarks as required.

Step 8 After setting import parameters, click **Create**.

Confirm the information again before you click **OK** because original data may be overwritten after data import.

Step 9 On the displayed page, view import progress in the task list.

Click **Details** in the **Operation** column to view task details.

----End

5.9.2 Exporting Data

DAS allows you to export a large amount of data at a time to facilitate data query or to back up data for migration. This section describes how to export data.

DAS allows you to export an entire database, some data tables, or result sets of SQL statements.


Usage Notes

- If you do not select **Generate a file for each table** when exporting data, the exported data file is in **.zip** format. Data files in this format cannot be directly imported. You need to decompress the file before importing it again.
- If **Generate a file for each table** is selected during data export, the exported data file is in **.sql** or **.csv** format. In this case, the exported data file can be directly imported again.
- If the **Exporting a Database** function is used to export over 100,000, PostgreSQL instance tables, an error message will be displayed indicating that the number of tables is too large and data cannot be exported. In this case, use the **Exporting SQL Results** function instead.
- This function is not available to PostgreSQL Enhanced Edition instances.
- Only OBS buckets of the current IAM account can be exported.

Exporting a Database

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

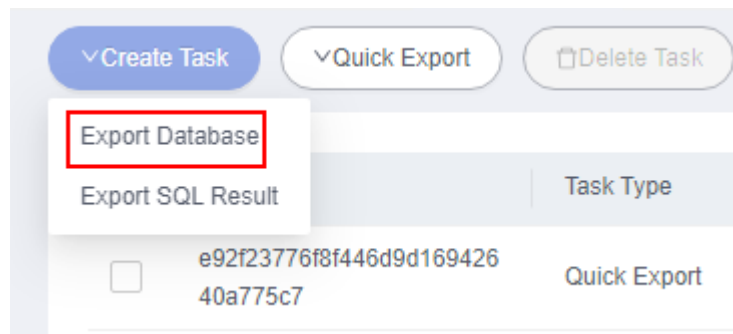
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

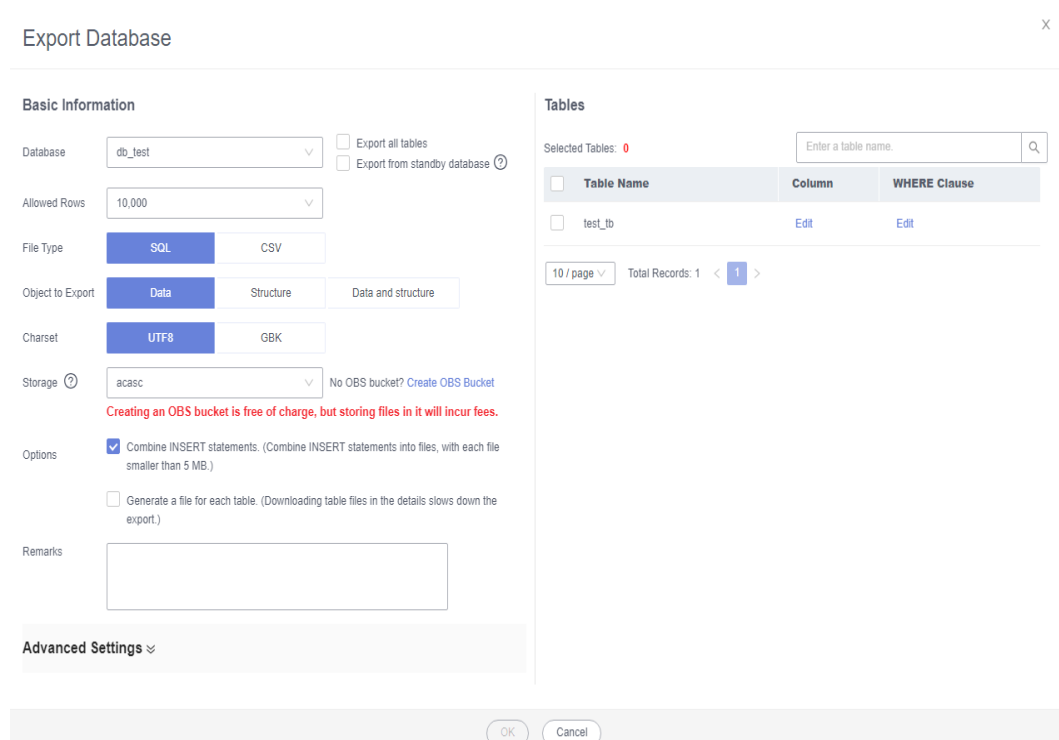
Step 7 In the upper left corner of the page, click **Create Task** and choose **Export Database**.

Figure 5-29 Creating a task for exporting a database



Step 8 In the displayed dialog box, configure basic information and advanced settings as required.

Figure 5-30 Creating a task for exporting a database



NOTE

Functions listed in **Table 5-6** are automatically created by a PostgreSQL instance. When importing data on DAS, you need to manually delete the functions.

Table 5-6 Functions

1	public.create_plugin_pg_cron
2	public.drop_plugin_pg_cron
3	public.create_plugin_pg_repack

4	public.drop_plugin_pg_repack
5	public.create_plugin_dblink
6	public.drop_plugin_dblink
7	public.select_control_version
8	public.create_plugin_postgres_fdw
9	public.drop_plugin_postgres_fdw
10	public.create_plugin_pg_repack
11	public.drop_plugin_pg_repack
12	public.create_plugin_pg_stat_statements
13	public.drop_plugin_pg_stat_statements
14	public.create_plugin_pg_cron
15	public.drop_plugin_pg_cron
16	public.control_extension
17	public.control_tablespace

- If you select **Export all tables**, data in an entire database or in specific tables will be exported.
- Databases are classified into user databases and system databases. System database cannot be exported. If system database data is required, deploy system database services in a user database, so that you can export the system database data from the user database.
- DAS connects to your standby database to export data. This prevents the primary database from being affected by data export. However, if the standby database has a high replication delay, the exported data may not be the latest.
- DAS does not store any user data. The exported data files are stored in the OBS bucket that you have created. You can specify the storage path. You can click **Bucket ACL Info** in the **Create Task** dialog box to check whether a public OBS bucket is selected.
- Creating OBS buckets is free of charge, but saving files will incur certain costs.

Step 9 After settings are complete, click **OK**.

Step 10 In the task list, locate the created task and view the task ID, type, status, and progress.

Step 11 Click **Details** in the **Operation** column to view task details.


Figure 5-31 Task list


Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
4c341463a2c146a7b20584c430200140	Database	db_test	2023-07-14 10:42:10	2023-07-14 10:42:11	260.89 KB	SQL	Successful	1 second	10000	100%		Details Download
e92023778914469d16942640a775c7	Quick Export	db_test	2023-07-14 10:39:20	2023-07-14 10:39:21	1.61 MB	SQL	Successful	1 second	100000	100%		Details Download

----End

Exporting SQL Results

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

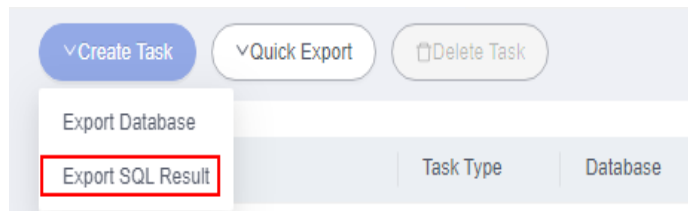
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

Step 7 In the upper left corner of the page, click **Create Task** and choose **Export SQL Result**.

Figure 5-32 Creating a task for exporting SQL results



Step 8 In the displayed dialog box, configure basic information and advanced settings as required.

Figure 5-33 Creating a task for exporting SQL results

Export SQL Result X

Basic Information

Database: Export from standby database ?

Allowed Rows:

File Type:

Charset:

Storage ?: No OBS bucket? [Create Bucket](#)

Creating an OBS bucket is free of charge, but storing files in it will incur fees.

Options: Combine INSERT statements. (Combine INSERT statements into files, with each file smaller than 5 MB.)

Generate one file for each result.

SQL to Execute:

Remarks:

Advanced Settings ∨

- In a SQL result export task, the executed SQL statements cannot exceed 5 MB.
- To export multiple SQL result sets at a time, enter SQL statements in the SQL text box. Enter each SQL statement on a separate line and add a semicolon (;) at the end. After the export task is complete, SQL files are generated. One SQL statement corresponds to one file.
- DAS does not store any user data. The exported data files are stored in the OBS bucket that you have created.
- You can click **Bucket ACL Info** in the **Create Task** dialog box to check whether a public OBS bucket is selected.
- Creating OBS buckets is free of charge, but saving files will incur certain costs.

Step 9 After settings are complete, click **OK**.

Step 10 In the task list, locate the created task and view the task ID, type, status, and progress.

Step 11 Click **Details** in the **Operation** column to view task details.

Figure 5-34 Task list

Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
0f0a17f020b84b3d05511077b1040000	SQL Backup	db_test	2023-07-14 10:4 8:30	2023-07-14 10:4 8:30	200.84 KB	SQL Backup	Successful	1 second	10000	100%		Details Download
450a17f020b84b3d05511077b1040000	Database	db_test	2023-07-14 10:4 2:30	2023-07-14 10:4 2:31	200.89 KB	SQL	Successful	1 second	10000	100%		Details Download
80202770b84b3d05511077b1040000	Quick Export	db_test	2023-07-14 10:3 8:20	2023-07-14 10:3 8:21	1.41 MB	SQL	Successful	1 second	100000	100%		Details Download

----End

Downloading Data Files


Data exported using the data export function is stored in the OBS bucket you created. You can download exported data files in any of the following ways:

- Download on the DAS Console.
- Download on the OBS management console.

Quick Export (Not Promoted)

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

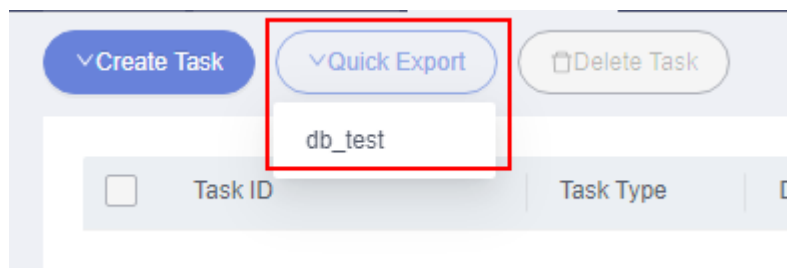
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

Step 7 In the upper left corner of the page, click **Quick Export** and select the database that you want to export data from.

Figure 5-35 Quick export

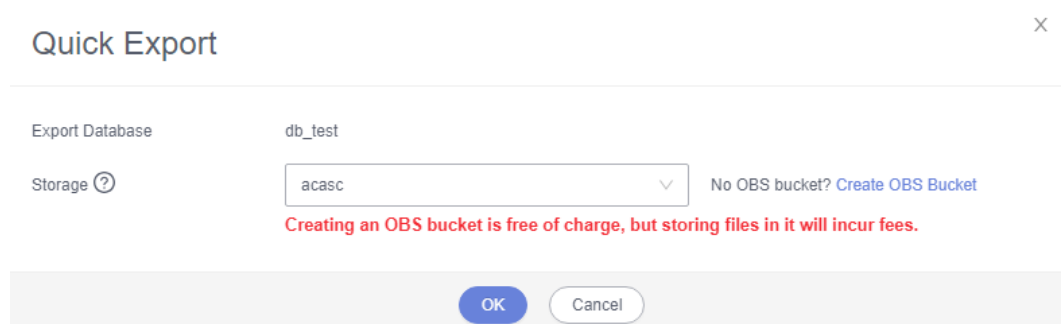


NOTE

A maximum of 200,000 rows can be quickly exported from a single table. To export more data, choose **Create Task > Export Database**.

Step 8 On the **Quick Export** page, select a storage path and click **OK**.

Figure 5-36 Quick export



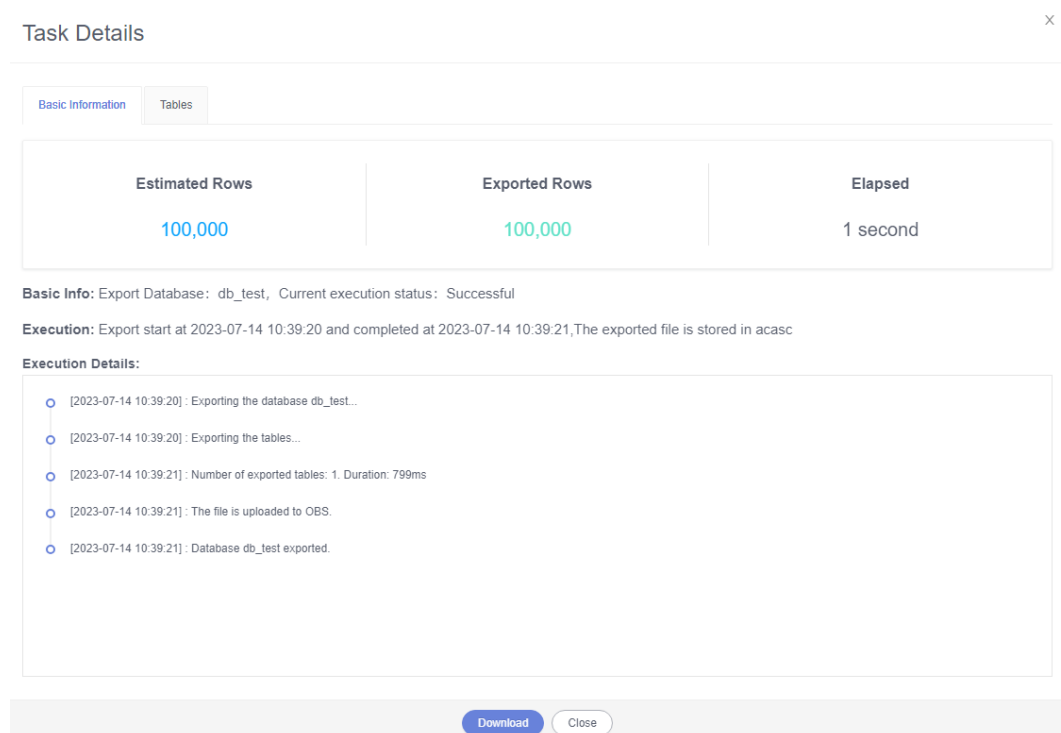
Step 9 In the task list, view the export task you created.

Figure 5-37 Task list

Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
e4023778844646d16942646a775c7	Quick Export	db_test	2023-07-14 10:39:20	2023-07-14 10:39:21	1.61 MB	SQL	Successful	1 second	100000	100%		Details Download

In the row that contains the export task, you can click **Details** in the **Operation** column to view execution details of the task and information about exported tables.

Figure 5-38 Task details



----End

5.10 Intelligent O&M

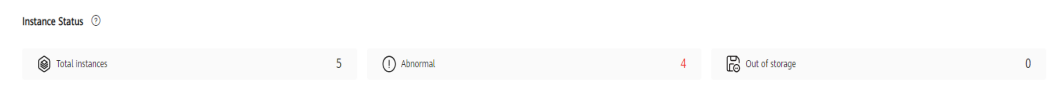
5.10.1 Dashboard

Dashboard helps you get knowledge of overall information about your instances, including instances by status, engine distribution, active alarms, slow query logs, monitoring dashboard, and resource risky instances. Intelligent Diagnosis checks instance health using instance operation data and intelligent algorithms and provides diagnosis results and suggestions.

Viewing the Instance Status

You can view the number of instances by status in the current region, including primary instances and read replicas.

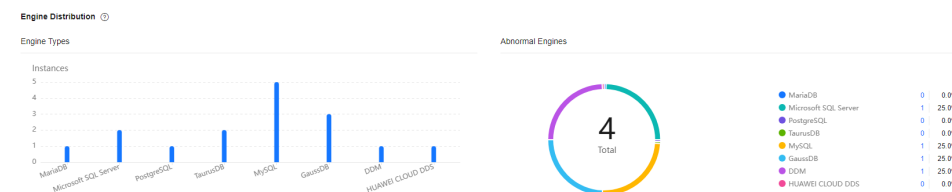
Figure 5-39 Instance status



Viewing Engine Distribution

You can view the distribution of engines in the current region, including engine types and abnormal engines.

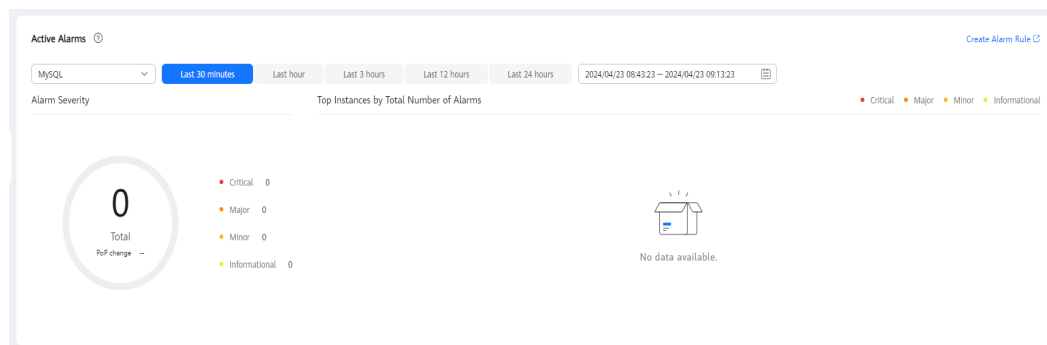
Figure 5-40 Engine distribution



Querying Active Alarms

You can view active alarms of all instances in the current region, including alarms in the Alarm (metric) and Triggered (event) statuses.

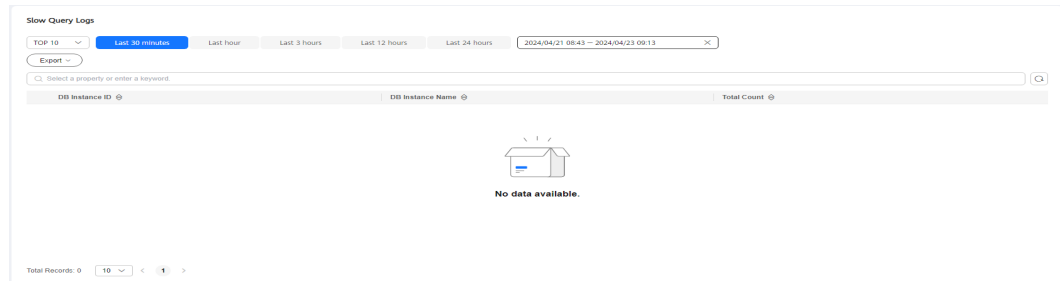
Figure 5-41 Active alarms



Viewing Slow Query Logs

You can view the number of slow query logs of all instances in the current region.

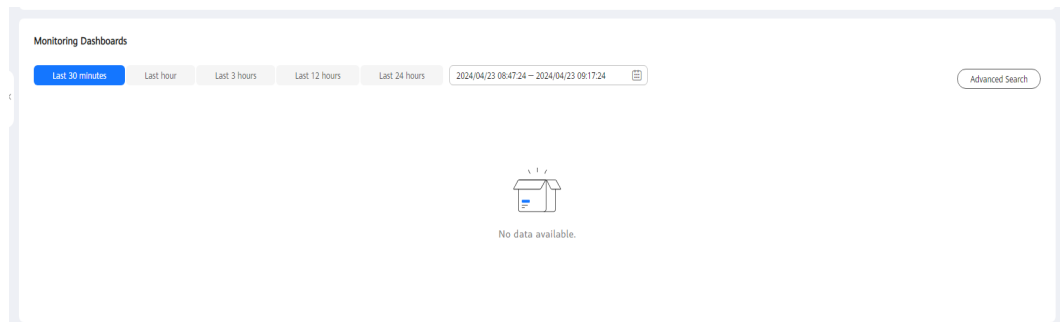
Figure 5-42 Slow query logs



Monitoring Dashboards

You can view metrics of all instances in the current region.

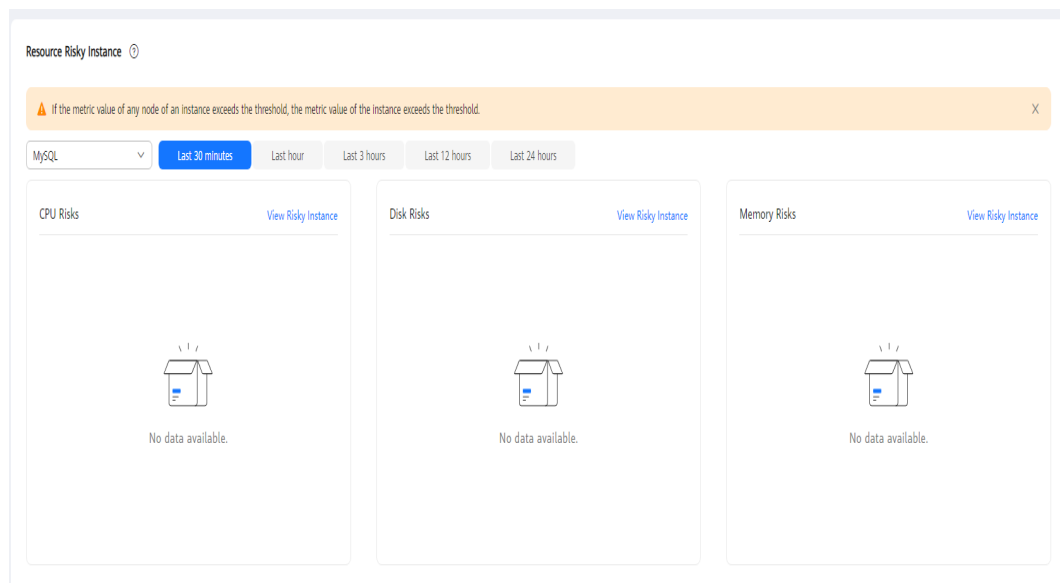
Figure 5-43 Monitoring dashboards



Viewing Resource Risky Instances

You can view metric risks of all instances in the current region.

Figure 5-44 Resource risky instances



5.10.2 Setting an Instance as Paid

Intelligent O&M is available for paid and free instances. Paid instances can enjoy more value-added functions.

For details about instance billing policies, see [Intelligent O&M Billing](#).

If you want to set an instance as paid, go to [Setting an Instance as Paid](#).


If you want to set more than one instance as paid, go to [Setting Instances as Paid](#).

If you want to set your instances as free instances, see [Setting a Paid Instance as Free](#).

Setting an Instance as Paid

Step 1 [Log in to the Huawei Cloud console](#).

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

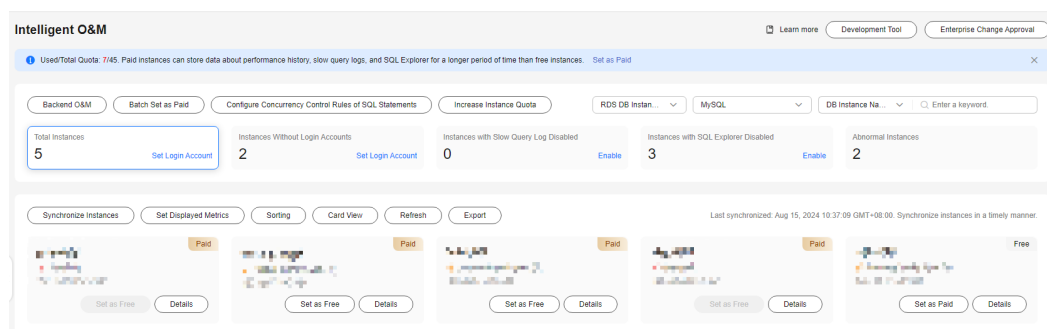
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 5-45 Searching for instances



Step 6 Select the instance that you want to set as paid and click **Set as Paid**.



Step 7 Carefully read the information displayed in the dialog box and click **OK**.

Step 8 On the **Instance List** page, check whether the instance status changes to **Paid**.

----End

Setting Instances as Paid

Step 1 [Log in to the Huawei Cloud console](#).

- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** On the displayed page, click **Batch Set as Paid** or **Set as Paid**.
- Step 6** Carefully read the information displayed in the dialog box, select the instances that you want to set as paid, and click **OK**.
- Step 7** On the **Instance List** page, check whether the instance status changes to **Paid**.
----End

Setting a Paid Instance as Free



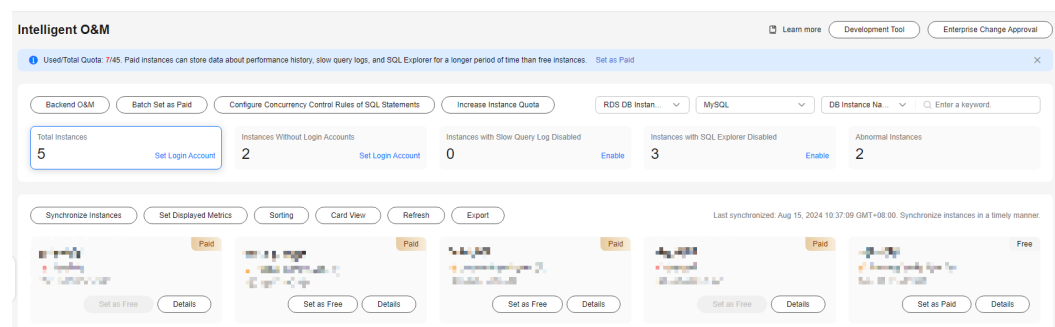
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 5-46 Searching for instances



- Step 6** Locate the instance that you want to set as free and click **Set as Free** on the **Instance Overview** page.
- Step 7** Carefully read the information displayed in the dialog box and click **OK**.
- If an instance is set as paid, you have to wait 5 minutes before it can be changed back to free.
 - On the **Instance List** page, check whether the instance status changes to **Free**.
- End

5.10.3 SQL

5.10.3.1 Slow Query Logs

This section describes how to analyze slow query logs in a specified period. Slow Query Log displays a chart of SQL statements that are taking too long to execute and allows you to sort slow SQL statements by multiple dimensions, such as by user, host, or SQL template. It helps you quickly identify bottlenecks and improve instance performance.


Usage Notes

- To use the slow query log function, you need to toggle on **Collect Slow Query Logs**. Then DAS will store slow query logs for analysis.
- Slow query logs of free instances are retained for only one hour while those of paid instances are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.
- You can enable the slow query logs function for a maximum of 10 free instances. There is no such a limit on paid instances.
- For free instances, you can only view slow query logs generated in the latest hour.

Viewing Slow Query Logs

Step 1 [Log in to the Huawei Cloud console](#).

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

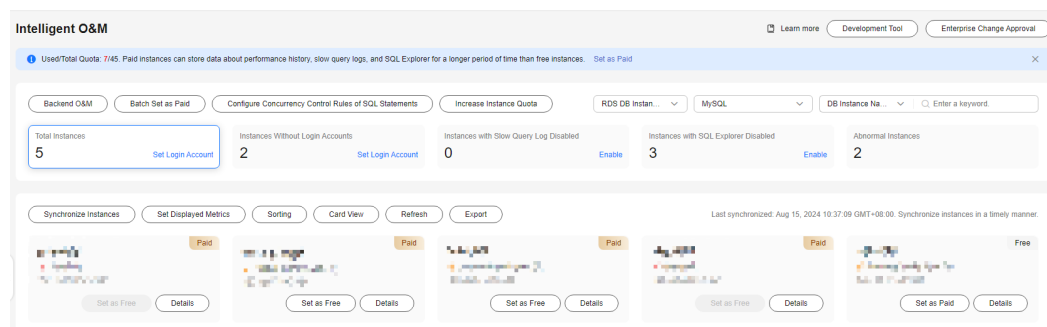
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 5-47 Searching for instances



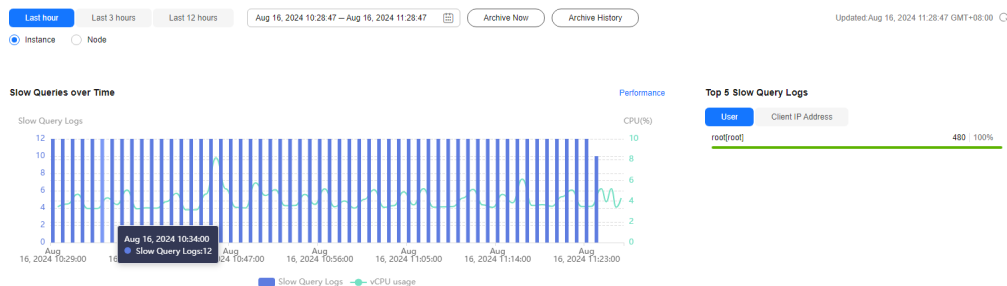
Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL > Slow Query Logs**.

Step 8 Select a time range and view trends, statistics, and details of the slow query logs generated within the time range.

- Log trends

Figure 5-48 Slow queries over time



In the trends graph, you can hover your mouse at any point in time to view slow query logs.

- Log details

View slow query log details in the lower part of the **Slow Query Logs** area. The details include the SQL statement, execution time, database name, client, user, execution duration, lock wait duration, and scanned and returned rows.

Figure 5-49 Viewing slow query log details

Details Statistics

Export View Export List

Default search by SQL statement

NO.	Execution St...	SQL Statement	Database	Client IP Address	User	Execution D...	Lock Wait TI...	Rows Scanned	Rows Retu...	Operation
1	Aug 16, 2024 14...	select sleep...	czh_test	...	root[root]	2,000,272	0	0	1	Concurrency Control Diagnose
2	Aug 16, 2024 14...	select sleep...	czh_test	...	root[root]	2,000,264	0	0	1	Concurrency Control Diagnose
3	Aug 16, 2024 14...	select sleep...	czh_test	...	root[root]	2,000,287	0	0	1	Concurrency Control Diagnose

Click **Export** to export slow query log details to a specific OBS bucket. After the details are exported, you can click **Export History** to view export records. You can also download the details to your local PC.

Figure 5-50 Exporting slow query log details

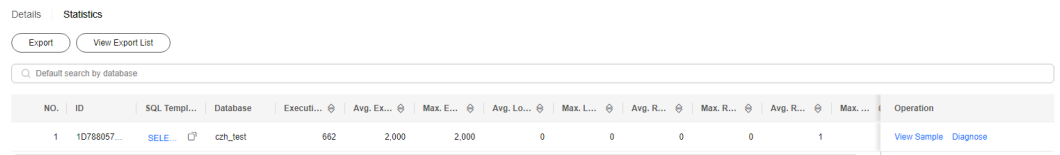


 **NOTE**

This function is available to only paid instances.

- Slow query log statistics

Figure 5-51 Slow query log statistics



NO.	ID	SQL Tempt...	Database	Executi...	Avg. Ex...	Max. E...	Avg. Lo...	Max. L...	Avg. R...	Max. R...	Avg. R...	Max...	Operation
1	10788057...	SELE...	czh_test	662	2,000	2,000	0	0	0	0	1		View Sample Diagnose

Click **Sample** in the **Operation** column to view the sample of the SQL statement template.

On the **Statistics** page, click **Export** to export slow query logs to a specific OBS bucket. Then you can click **Export History** to view export records. You can also download the exported slow query logs to your local PC.

 **NOTE**

This function is available to only paid instances.

----End

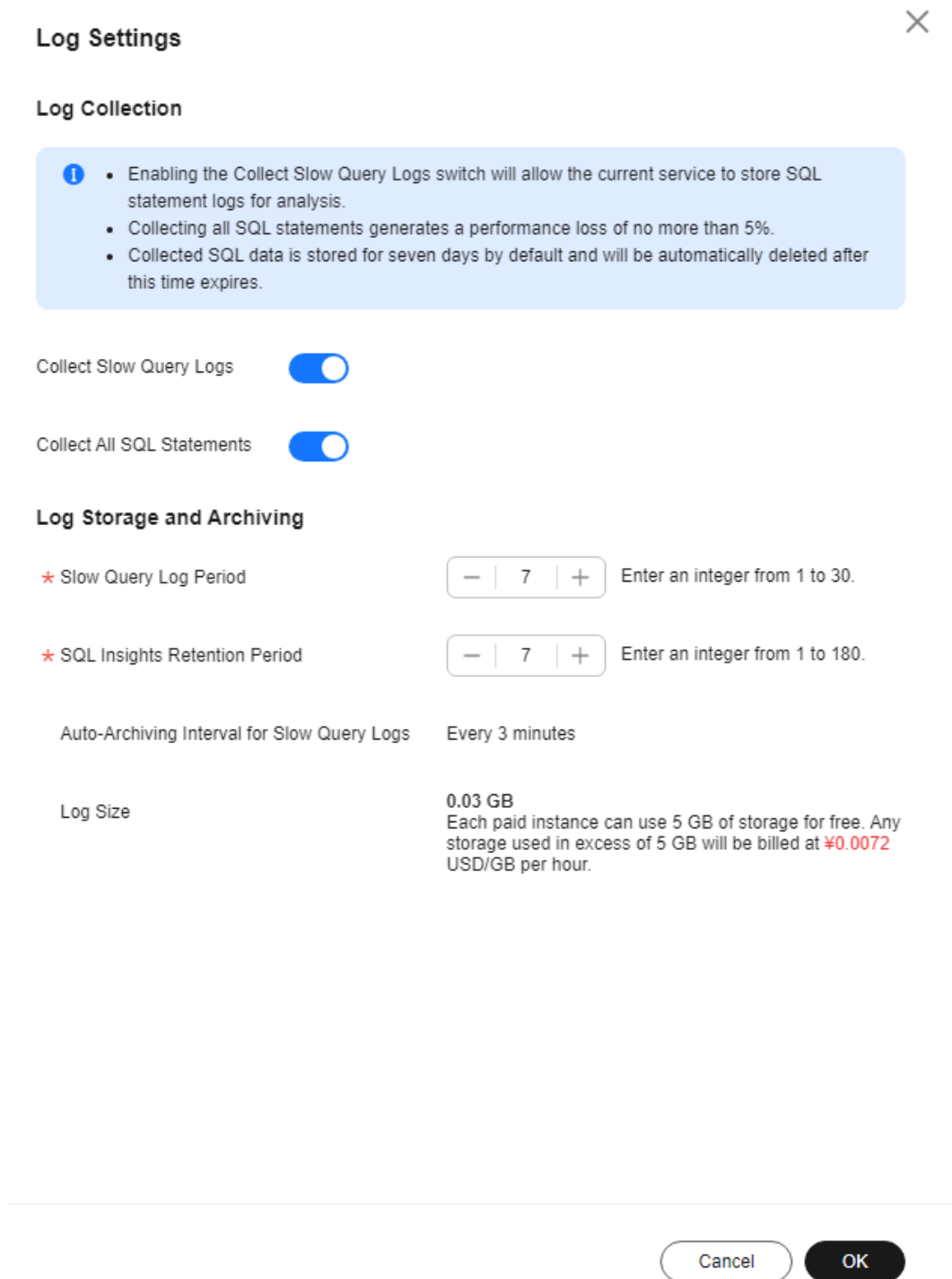
Slow Query Log Storage

After **Collect Slow Query Logs** is enabled, SQL text content will be stored in OBS for analysis.

Slow query logs of free instances are retained for only one hour while those of paid instances are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.

For paid instances, you can click **Log Settings** to set the storage duration on the **Slow Query Logs** tab page.

Figure 5-52 Setting storage duration for slow query logs



Each paid instance can use 5 GB of storage for slow query logs free of charge. Any storage used in excess of 5 GB will be billed on a pay-per-use basis.

5.10.3.2 SQL Explorer

After **Collect All SQL Statements** is enabled, you can gain a comprehensive insight into SQL statements on the **SQL Explorer** page. Top SQL helps you locate exceptions.

SQL Explorer can record all SQL statements executed on your instance and enables you to analyze and search for the tables that are accessed and updated the most frequently and the SQL statements that have the longest lock wait.

Usage Notes

- After **Collect All SQL Statements** is disabled, new SQL statements will not be collected and the collected SQL statements will be deleted.
- Logs of all SQL statements executed on free instances can be retained for only one hour while those for paid instances can be retained for seven days by default and for up to 30 days as a maximum. After the retention period expires, the logs are deleted automatically.
- SQL Explorer cannot record all data. As for RDS for PostgreSQL, it has the following constraints:

SQL Explorer is limited by the memory buffer, so some data may not be recorded when a buffer overrun occurs, for example, when the QPS is over 1000 or the usage of resources such as CPUs or memory becomes too high.

Any SQL statement that exceeds 4,096 bytes by default will be discarded.

SQL Explorer is available to only RDS for PostgreSQL instances of the following versions:

- Major version: 14; minor version: 14.4 or later
- Major version: 13; minor version: 13.6 or later (if the minor version is 13.2 or later but earlier than 13.6, SQL statements executed using psql can be collected, but those executed by other drivers like JDBC may not.)
- Major version: 12; minor version: 12.10 or later (if the minor version is 12.6 or later but earlier than 12.10, SQL statements executed using psql can be collected, but those executed by other drivers like JDBC may not.)
- Major version: 11; minor version: 11.15 or later (if the minor version is 11.11 or later but earlier than 11.15, SQL statements executed using psql can be collected, but those executed by other drivers like JDBC may not.)
- Major version: 10; minor version: 10.20 or later (if the minor version is 10.16 or later but earlier than 10.20, SQL statements executed using psql can be collected, but those executed by other drivers like JDBC may not.)
- Major version: 9.6; minor version: 9.6.24 or later (if the minor version is 9.6.21 or later but earlier than 9.6.24, SQL statements executed using psql can be collected, but those executed by other drivers like JDBC may not.)
- Major version: 9.5; minor version: 9.6.25 or later (for some instances with the minor version of 9.5.25, SQL statements executed using psql can be collected, but those executed by other drivers like JDBC may not.)

Execution Duration Distribution of Top SQL Templates

Step 1 [Log in to the Huawei Cloud console.](#)



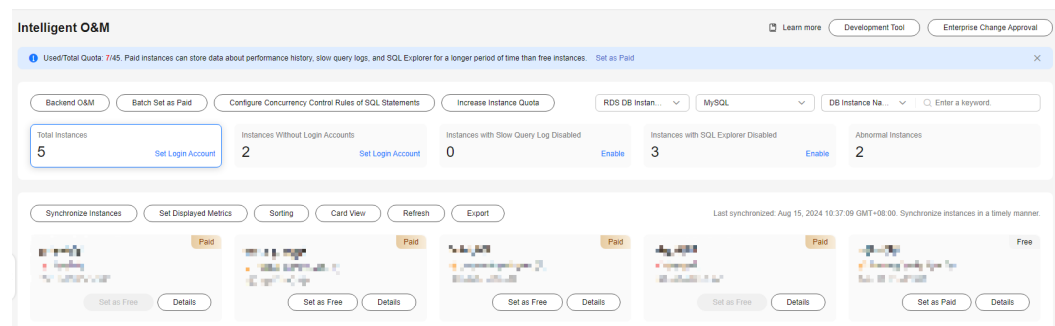
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 5-53 Searching for instances



- Step 6** Locate the target instance and click **Details**.
- Step 7** Choose **SQL > SQL Explorer**.
- Step 8** Toggle on **Collect All SQL Statements** to obtain information about all SQL statements executed on the current instance.

 **NOTE**

Collect All SQL Statements takes effect once it is enabled.

- Step 9** On the **Top SQL** tab page, view execution duration of top SQL statements.

You can select **Last 1 hour**, **Last 3 hours**, or **Last 6 hours** based on service requirements to view the distribution. Or customize a time range that is no longer than one day.

The Execution Duration Distribution graph shows how many times SQL statements with different elapsed time lengths are executed over a specified time range. DAS collects SQL statistics of four elapsed time lengths.

- < 100 ms: number of SQL statement executions whose elapsed time is less than 100 ms
- 100 ms–500 ms: number of SQL statement executions whose elapsed time ranges from 100 ms to 500 ms
- 500 ms–1s: number of SQL statement executions whose elapsed time ranges from 500 ms to 1s
- > 1s: number of SQL statement executions whose elapsed time is longer than 1s

SQL statistics in the four elapsed time lengths are collected over the time range you specified.

- If you select **Last hour**, SQL statement executions are calculated every 10 seconds.
- If you select **Last 6 hours**, SQL statement executions are calculated every minute.
- If you select a time range longer than 6 hours, SQL statement executions are calculated every 5 minutes.

Select **By instance** or **By node** to view execution duration distribution. You can change node to view its execution duration distribution. The primary node is selected by default. If you want to view the execution duration distribution of other nodes, click **Change Node**.

Step 10 Use either of the following methods to view execution duration details, such as average execution duration, total duration, average lock wait duration, and average scanned rows.


- Hover your mouse at any point in time on the graph to view top SQL statements at that time.
- Specify a time range using your mouse on the graph, and you will see top SQL statements during that time range.
- Click **Export** to export details about all top SQL templates in the list. This function is available only to paid instances.
- In the SQL template list, locate a SQL template and click **Details** to view the total execution times, average rows scanned, average execution duration, and the like.

----End

SQL Audit

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 On the **Overview** page, click **Go to Intelligent O&M**.

Step 5 Locate the target instance and click **Details**.

Step 6 Choose **SQL > SQL Explorer**.

Step 7 Click the **SQL Audit** tab.

Step 8 On the **SQL Audit** tab page, view SQL audit tasks.

- Specify the start time, end time, task creation time, and node information to search for SQL audit tasks.
- Click **Add SQL Audit Task** and specify a time range to add a task. You can add an instance- or node-level task based on your service requirements. The added SQL audit task is displayed in the list below.
- Click **Details** in the **Operation** column to view task details. You can specify filters such as **Time Range**, **User**, **Keyword**, or **Database** and click **Query** to

search for the SQL statements executed on the current instance. The selected time range must be after the time when the SQL audit task is added.

----End

5.10.3.3 SQL Diagnosis

This function enables you to diagnose SQL statements and obtain optimization suggestions.


Usage Notes

- Only SELECT, INSERT, UPDATE, and DELETE statements can be diagnosed. An INSERT statement must contain a SELECT clause.
- SQL diagnosis history is stored on the DAS server only. If you delete SQL diagnosis history on the console, it will be also deleted from the DAS server.
- Well-formatted SQL statements are much easier to read. Only line breaks will be added, and there are no logic and semantic changes.
- All SQL statements in the SQL window will be formatted. You cannot format only one of them.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

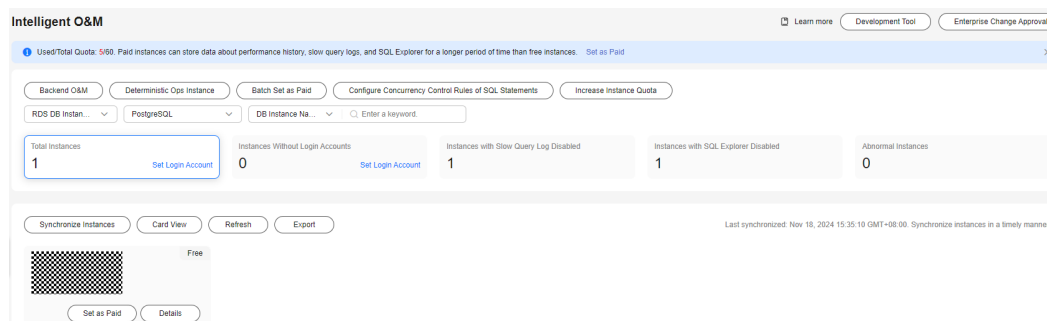
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP address.

Figure 5-54 Searching for instances



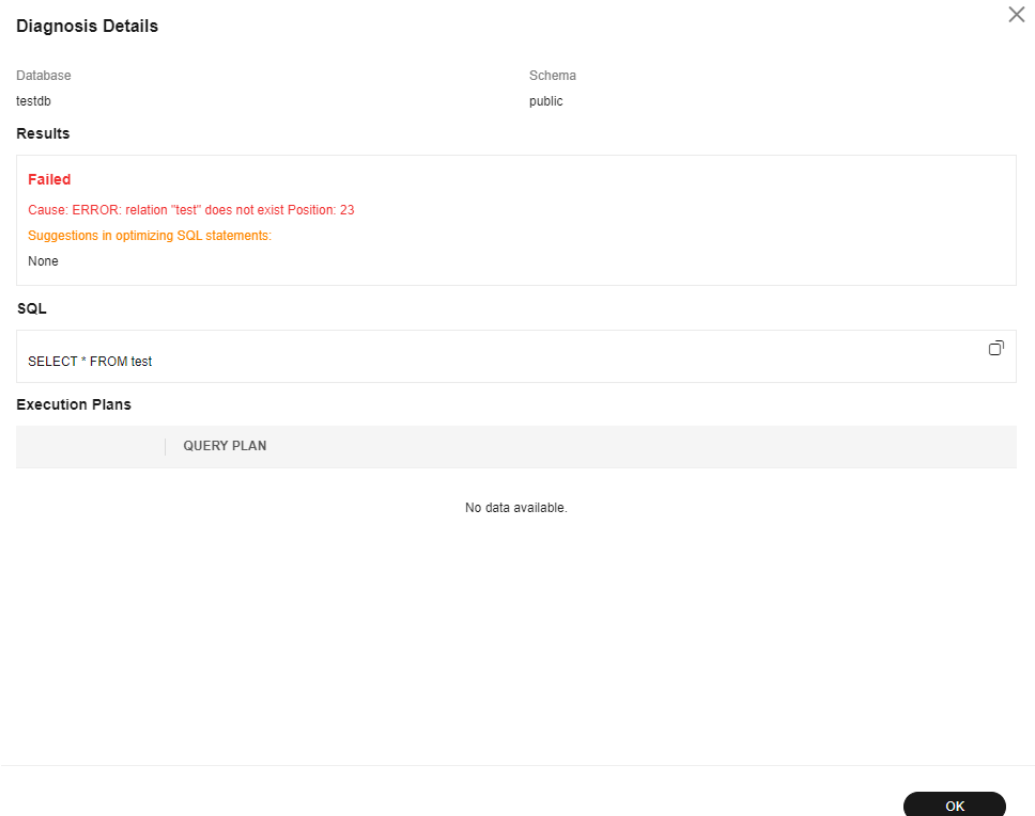
Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL > SQL Diagnosis**. On the displayed dialog box, perform the following operations:

- Diagnosing SQL Statements

On the **SQL Diagnosis** tab page, select the database where you want to diagnose a SQL statement, enter a SQL statement, and click **Diagnose**. The diagnosis result page is displayed. You can optimize the SQL statement based on the diagnosis result.

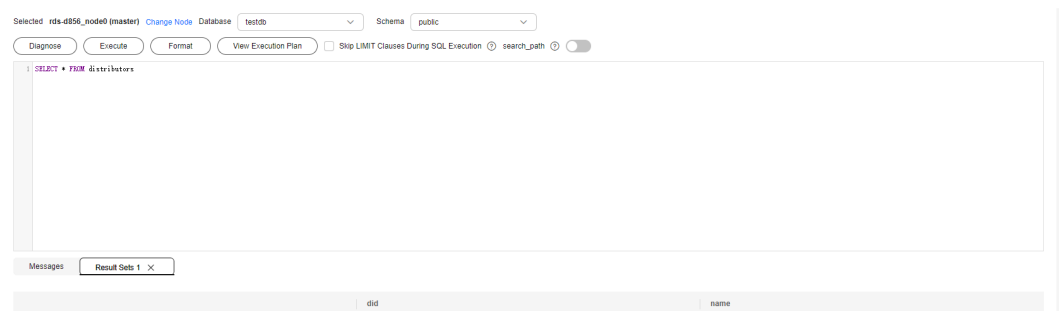
Figure 5-55 SQL diagnosis



- Executing SQL Statements

Select the target database, enter a SQL statement, and click **Execute**. The system executes the statement and displays a result set.

Figure 5-56 Result set



- Formatting SQL Statements

Select the target database, enter SQL statements, and click **Format**. The system formats all the SQL statements.

- Viewing the Execution Plan
Select the target database, enter SQL statements, and click **View Execution Plan**. The system executes all the SQL statements in sequence.

----End

6 RDS for MariaDB

6.1 Account Management

6.1.1 Creating a User

Multiple users with different permissions can be created to access a DB instance or database, but the permissions of these users must be within a certain range.

Procedure



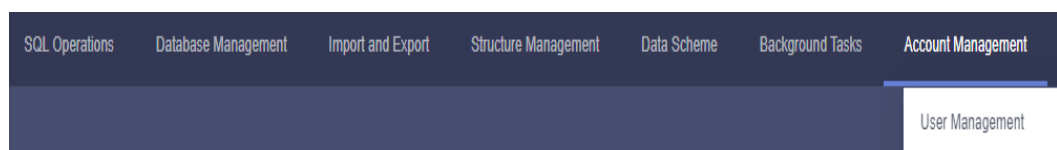
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > User Management**.

Figure 6-1 User management



- Step 7** Click **Create User**.

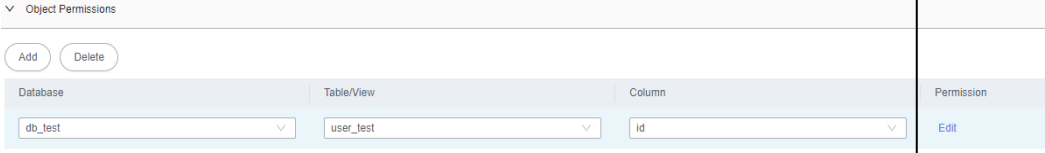
Figure 6-2 Creating a user

Configure required details, such as basic information, advanced settings, global permissions, object permissions, and roles by referring to [Table 6-1](#).

Table 6-1 Parameter description

Type	Parameter	Configuration Description
Basic Information	Username	Name of the new user.
	Host	<p>Whitelisted IP addresses allowed to access the database server.</p> <ul style="list-style-type: none"> If you leave this parameter blank or enter %, the user can access all IP addresses. If you enter multiple IP addresses, separate them with commas (.). For example, if you enter 192.%,193.% for Host, two users with host addresses of 192.% and 193.% will be created, respectively. You can click Add DAS IP Address to add a DAS server IP address to the user host.

Type	Parameter	Configuration Description
	Password	Password of the user. The password: <ul style="list-style-type: none"> • Can include 8 to 32 characters. • Contains at least three types of the following characters: lowercase letters, uppercase letters, digits, and special characters ~!@#%&^*-_+=?,&(). • Cannot be the username or the username spelled backwards. • Cannot be a weak password.
	Confirm Password	The value must be the same as the user password you set.
Advanced Settings	Max. Queries Per Hour	Maximum queries that this user can execute within an hour. If this parameter is left empty or set to 0 , there is no limit on the maximum queries.
	Max. Updates Per Hour	Maximum updates that this user can execute within an hour. If this parameter is left empty or set to 0 , there is no limit on the maximum updates.
	Max. Connections Per Hour	Maximum connections (of this user) to the DAS server within an hour. If this parameter is left empty or set to 0 , there is no limit on the maximum connections.
	Max. User Connections	Maximum concurrent connections to the server. If this parameter is left empty or set to 0 , there is no limit on the maximum concurrent connections.
	SSL Type	Type of certificates for authenticating user requests sent to the server.
	Issuer	Authority that issues X.509 certificates for connecting the user to the server.
	Subject	Subject of the X.509 certificates for connecting the user to the server.
	Algorithm	Method of encrypting connections between the user and the server.
Global Permissions	Permissions granted to the user to perform operations on all databases in the current instance. For details about the global permissions that can be configured, see Table 6-2 . For details about permission usages and explanations, visit the official website .	

Type	Parameter	Configuration Description
Object Permissions		<p>Permissions granted to the user on specific objects.</p> <p>For details about the object permissions that can be configured, see Table 6-2. For details about permission usages and explanations, visit the official website.</p> <p>Example:</p> <p>The following settings grant the user the permission to query the ID of table user_test in database db_test.</p> <p>Figure 6-3 Adding an object permission</p>  <p>On the Object Permissions tab, you can add or delete object permissions and click Save. In the displayed dialog box, click OK.</p>

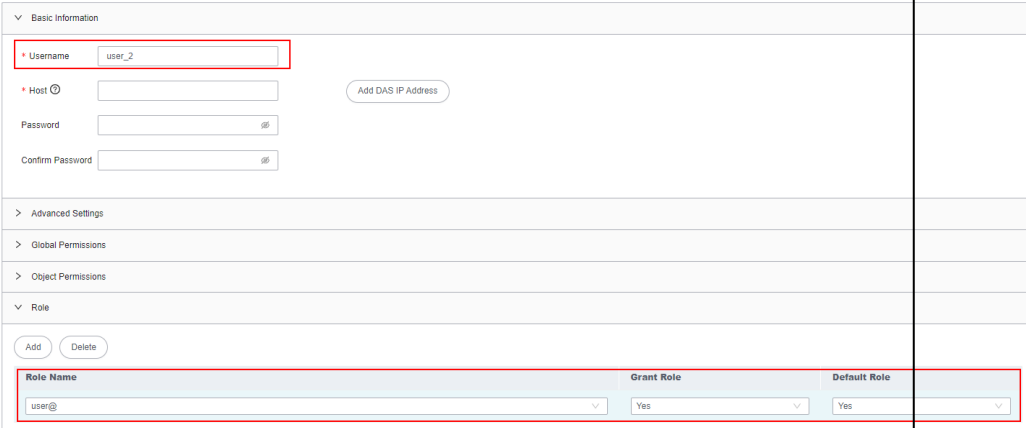
Type	Parameter	Configuration Description
Role		<p>Role of the user. Roles are only supported for MySQL 8.0.</p> <ul style="list-style-type: none"> • Role Name: You can select an existing username in this instance. • Grant Role: Whether the new user can grant permissions of the selected role to another user. • Default Role: Whether the new user can inherit permissions of the selected role. <p>NOTE To manage roles, the current account must have the ROLE_ADMIN permission. You can manually assign the permission. For example, you can run the GRANT ROLE_ADMIN on *.* TO 'root'@' %' command to assign the ROLE_ADMIN permission to user root.</p> <p>Example: The following settings indicate that user_2 can inherit permissions of user@ and can grant permissions of user@ to another user.</p> <p>Figure 6-4 Granting permissions</p>  <p>The screenshot shows a web interface for configuring a user. Under the 'Role' section, there are three dropdown menus: 'Role Name' (set to 'user@'), 'Grant Role' (set to 'Yes'), and 'Default Role' (set to 'Yes'). Red boxes highlight the 'Role Name' dropdown and the entire 'Role' configuration row.</p>

Table 6-2 Permission description

Permission	Description
SELECT	Permission to query a specified object, for example, a global or single database.
INSERT	Permission to insert data into a specified object.
UPDATE	Permission to update data of a specified object.
DELETE	Permission to delete data from a specified object.
CREATE	Permission to create databases and tables for a specified object.

Permission	Description
DROP	Permission to delete databases, tables, and views from a specified object.
RELOAD	Permission to execute FLUSH .
PROCESS	Permission to execute SHOW PROCESSLIST to view all the processes.
GRANT	Permission to grant a specified object the permissions of another account or reclaim permissions from other accounts.
REFERENCES	Permission to create foreign keys for a specified object.
INDEX	Permission to create or delete an index for a specified object.
ALTER	Permission to execute ALTER TABLE for a specified object.
SHOW DATABASES	Permission to run SHOW DATABASES to show all databases.
CREATE TEMPORARY TABLES	Permission to execute CREATE TEMPORARY TABLE for a specified object.
LOCK TABLES	Permission to execute LOCK TABLES on the tables with the SELECT permission for a specified object.
EXECUTE	Permission to execute a stored procedure for a specified object.
REPLICATION SLAVE	Permission to allow the replica server to read binary log events from the source server.
REPLICATION CLIENT	Permission to query locations of the source server or replica server.
CREATE VIEW	Permission to create or alter a view for a specified object.
SHOW VIEW	Permission to execute SHOW CREATE VIEW for a specified object.
CREATE ROUTINE	Permission to create a stored procedure for a specified object.
ALTER ROUTINE	Permission to alter or delete a stored procedure for a specified object.
CREATE USER	Permission to execute CREATE USER , DROP USER , RENAME USER , and REVOKE ALL PRIVILEGES for a specified object.
EVENT	Permission to create, modify, delete, or display the event scheduler for a specified object.

Permission	Description
TRIGGER	Permission to execute a trigger for a specified object. Only users with this permission can create, delete, execute, or display triggers of a table.

Step 8 After configuring required parameters, click **Save**. In the preview dialog box, click **OK**.

Step 9 Return to the user management page.

In the user management list, edit, rename, or delete the created users.

----End

6.1.2 Editing a User

This section describes how to edit user details, including the username, password, global permissions, object permissions, and advanced settings.


Usage Notes

Improper database user settings will cause instance or service exceptions.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Account Management > User Management**.

Step 7 In the user list, locate the user whose information you want to edit and click **Edit** in the **Operation** column.

Step 8 On the displayed page, edit basic information, advanced settings, global permissions, and object permissions, and then click **Save**.

Figure 6-5 Editing user information

▼ Basic Information

* Username

* Host ?

* Password

* Confirm Password

> Advanced Settings

> Global Permissions

> Object Permissions

NOTE

- Permissions for multiple users cannot be modified at the same time. For example, if two users with the same username and different host addresses of 192.% and 193.% are created, modifying permissions of the user with the host address of 1192.% does not affect permissions of the other user.
- When you edit a user, adding host addresses to the user does not create multiple users. For example, if a user already has a host address, 192.%, adding host address 194.% to it does not create another user with the host address of 194.%. This operation only changes the host address of the user from 192.% to 192.%,194.%.

<input type="checkbox"/>	Username	Host	Global Permissions	Object Permissions	Operation
<input type="checkbox"/>	mariaadb.sys	localhost	0	1	Edit Delete
<input type="checkbox"/>	test	192.%,194.%	1	0	Edit Delete

Step 9 In the preview dialog box, click **OK**.

----End

6.1.3 Deleting a User

This section describes how to delete a user that is no longer needed.

Precautions

Deleted users cannot be recovered. Exercise caution when performing this operation.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > User Management**.
- Step 7** In the user list, locate the user that you want to delete and click **Delete** in the **Operation** column.

Figure 6-6 Deleting a user

<input type="checkbox"/>	Username	Host	Global Permissions	Object Permissions	Operation
<input type="checkbox"/>	mariaadb_sys	localhost	0	1	Edit Delete
<input type="checkbox"/>	test	192.168.1.104	1	0	Edit Delete

- Step 8** In the displayed dialog box, click **Yes**.
----End

6.2 Database Management

This section describes how to create, manage, or delete databases on the DAS console without running SQL commands.

Creating a Database



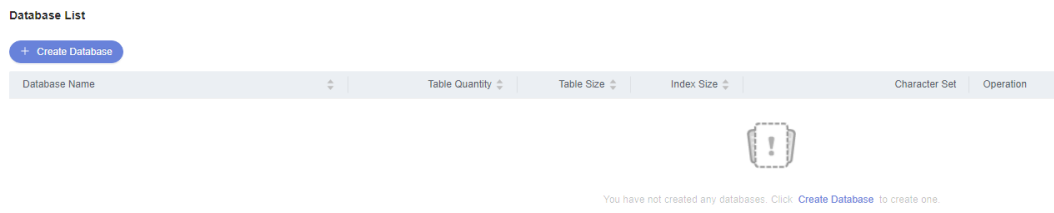
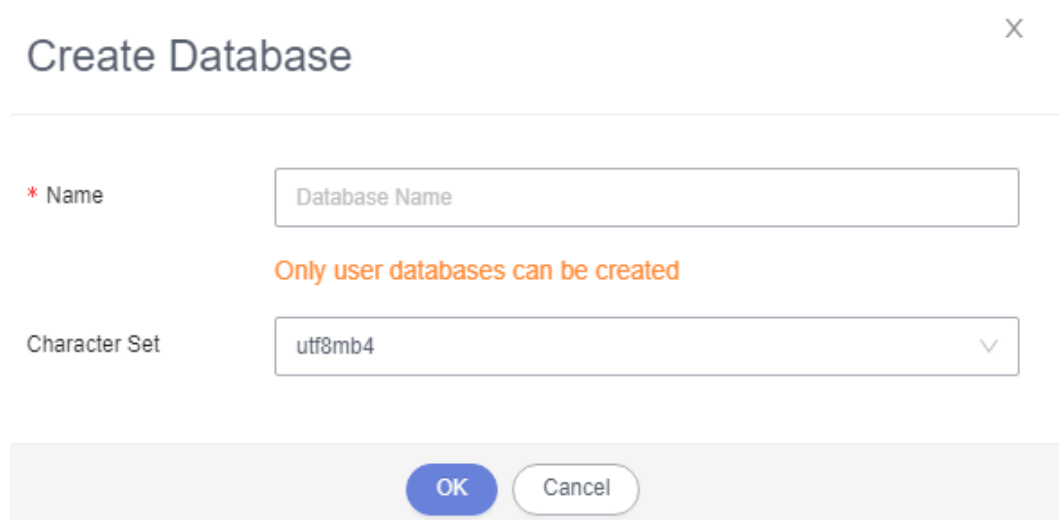
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** In the upper left corner of the database list on the **Home** page, click **Create Database**.

Figure 6-7 Creating a database



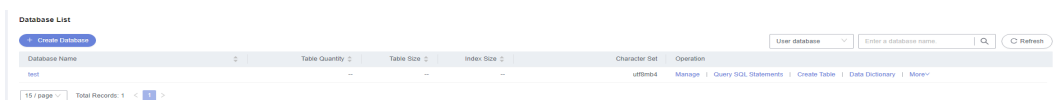
Step 7 In the displayed dialog box, enter a database name, specify a character set, and click **OK**.

Figure 6-8 Configuring database parameters



Step 8 View the created database in the database list.

Figure 6-9 Viewing the created database



----End

Managing Databases

You can manage database objects such as tables, views, stored procedures, events, triggers, and functions in a created database, and perform SQL query operations.

- [Table Management](#)
- [View Management](#)
- [Stored Procedure Management](#)
- [Event Management](#)
- [Trigger Management](#)
- [Function Management](#)
- [SQL query](#)

Dropping a Database



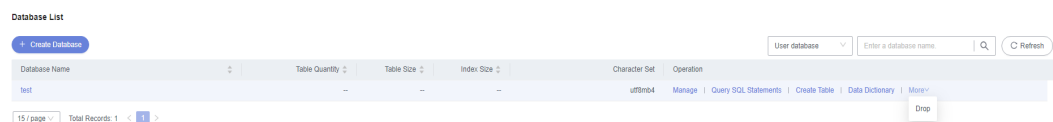
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** In the database list, locate the database you want to drop.
- Step 7** Choose **More > Drop** in the **Operation** column.

Figure 6-10 Dropping a database



- Step 8** Confirm the information and click **Yes**.

NOTE

Dropping a database is a high-risk operation. The database and all data in it will be removed and cannot be restored. Exercise caution when performing this operation.

----End

6.3 SQL Operations

6.3.1 SQL Window

DAS allows you to easily run various SQL statements in a graphical SQL window and to perform operations on databases, such as adding, deleting, editing, and viewing a database.

Introduction to SQL Window

Figure 6-11 SQL window

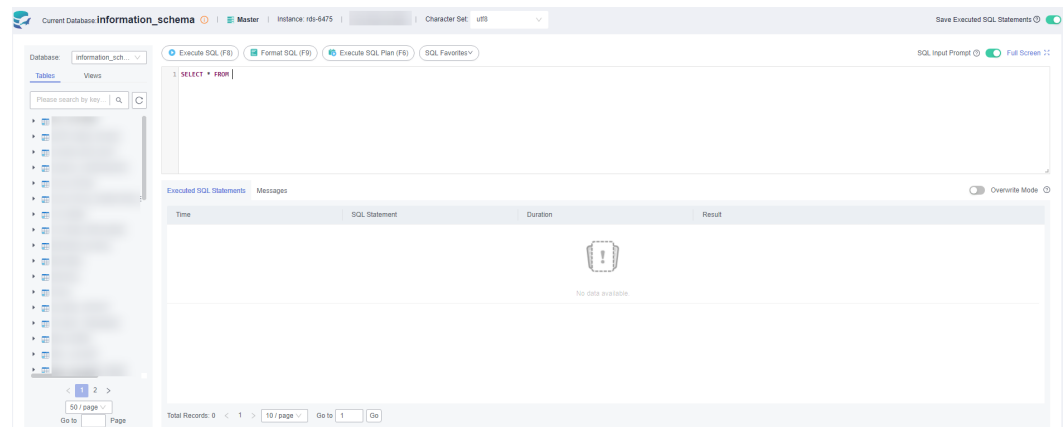




Table 6-3 Function description

Function	Description
Execute SQL	Executes SQL statements. SQL operations are performed on tables and views in a database.
Format SQL	Improves readability of SQL statements. Formatting SQL statements enables statements to be displayed in line break mode, but does not change their logic and semantics. SQL formatting takes effect for all the SQL statements in the SQL window. You cannot format only one selected statement.
Execute SQL Plan	Reports execution of SQL statements to make troubleshooting easy and optimize SQL processing performance.
SQL Favorites	Allows you to add, view, and manage frequently-used SQL statements.
Save Executed SQL Statements	After this function is enabled, the system saves the recently executed SQL statements to the server.
SQL Input Prompt	Helps you quickly enter a specific database, table, or field name when you enter a SQL statement in the SQL window.
Full Screen	Shows SQL statements on a full screen.
Executed SQL Statements	Shows SQL execution details.
Messages	Shows the information returned after a SQL statement is executed.

Function	Description
Result Set	Shows SQL execution results. Allows you to view details about a single row, add a row, submit for editing, delete a row, export a row, copy a row, copy a column, set a column, and more.
Overwrite/ Append Mode	<ul style="list-style-type: none">● Append Mode: Each time a SQL statement is executed, the new result set is appended to the previous one.● Overwrite Mode: Each time a SQL statement is executed, the new result set overwrites the previous one.



Opening the SQL Window

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- End

6.3.2 Executing SQL Statements

This section describes how to execute SQL statements.

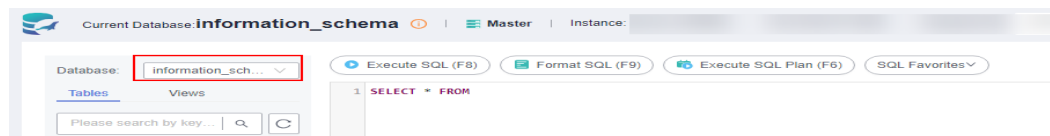
Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

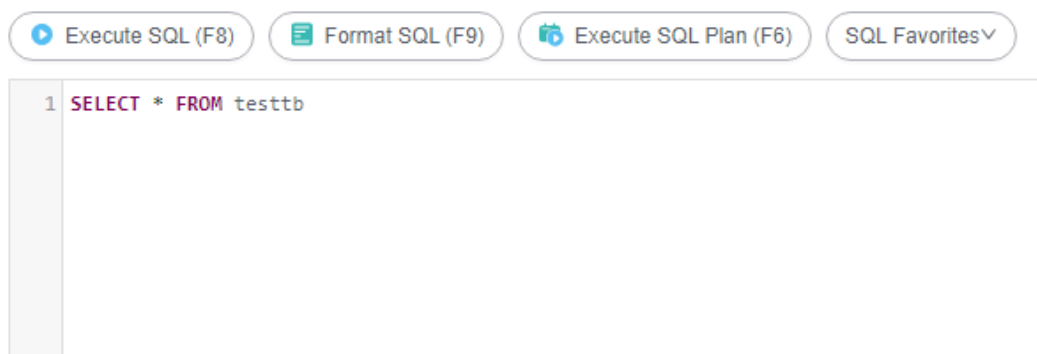
Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

Step 7 In the upper left corner of the page, select a database from the drop-down list.

Figure 6-12 Selecting a database



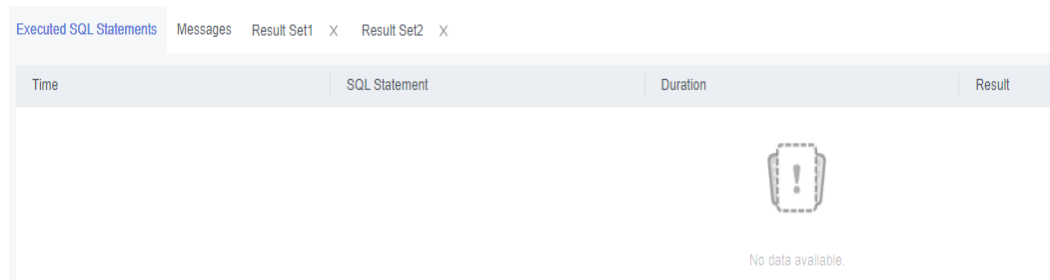
Step 8 Enter a SQL statement in the SQL window and click **Execute SQL**.



- Enabling **SQL Input Prompt** is recommended. It helps you select the required database, table, or field name when you enter a SQL statement in the SQL window.
- To protect query result sets from being displayed as garbled characters, select an encoding format other than the default encoding format, UTF-8.
- You can execute multiple SQL statements at a time. Separate them using semicolons (;). You can click **Full Screen** to view logics in SQL statements clearly.
 - To execute some of the SQL statements, select the statements before executing them.
 - To execute all SQL statements, do not select any SQL statements or select all SQL statements.

Step 9 View execution details of the current SQL statement and previously executed SQL statements in the lower part of the page.

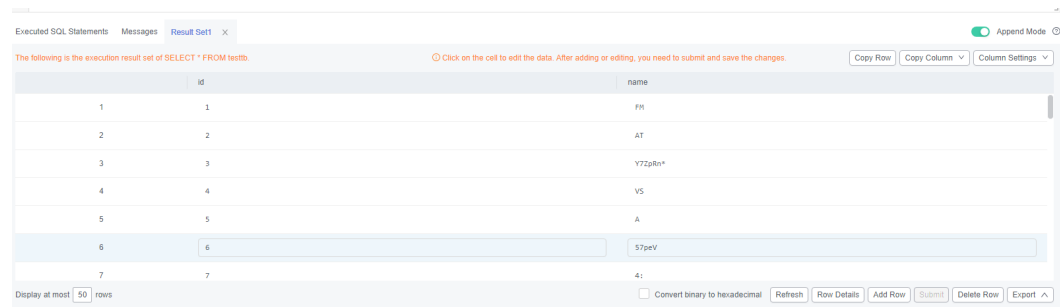
Figure 6-13 Viewing execution records



Step 10 Click the **Messages** tab, view SQL execution details, including affected rows, progress, and time required.

Step 11 On the **Result Set** tab, view SQL execution results.

Figure 6-14 Viewing result sets



You can also perform the operations described in [Table 6-4](#) on result sets.

Table 6-4 Operations

Function	Description
Copy Row and Copy Column	Copies a row or column for reuse.
Column Settings	Customizes the display of columns when there are a number of columns in the query result.
Convert binary to hexadecimal	Converts binary data in the result set into hexadecimal data for display.
Refresh	Refreshes changed data.
Row Details	Displays the column field name, type, and data of the selected row.
Add Row	Adds an empty row to the result set.
Submit	Views the SQL statements to be modified. After you click OK , the result set is updated.
Delete Row	Deletes the selected row, including data.
Export	The SQL, CSV, and Excel files are supported. No more than 7.84 MB of data with 10,000 records can be exported. The actual size of an Excel file may exceed 7.84 MB due to its format.
Export More	Redirects you to the data export page and allows you to export over 10,000 rows of data.

NOTE

- If the result set involves a view, data in the result set cannot be edited.
- If the type of the result set is metadata, the data cannot be edited or displayed on multiple pages.
- If the result set involves multiple tables, data in the result sets cannot be edited.
- If the result set involves only one table and does not include all the primary key columns of the table or no primary key is found, data in the result set cannot be edited.
- Data in virtual tables (for example, tables generated during execution of a stored procedure) cannot be edited.

----End

6.3.3 SQL Execution Plan

This section describes how to analyze the execution efficiency of a SQL statement.

Procedure



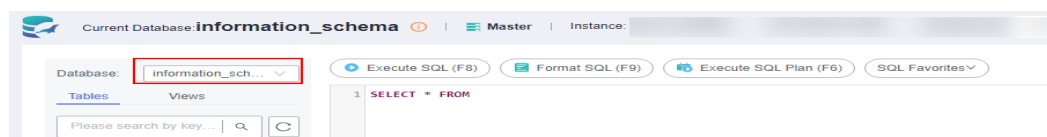
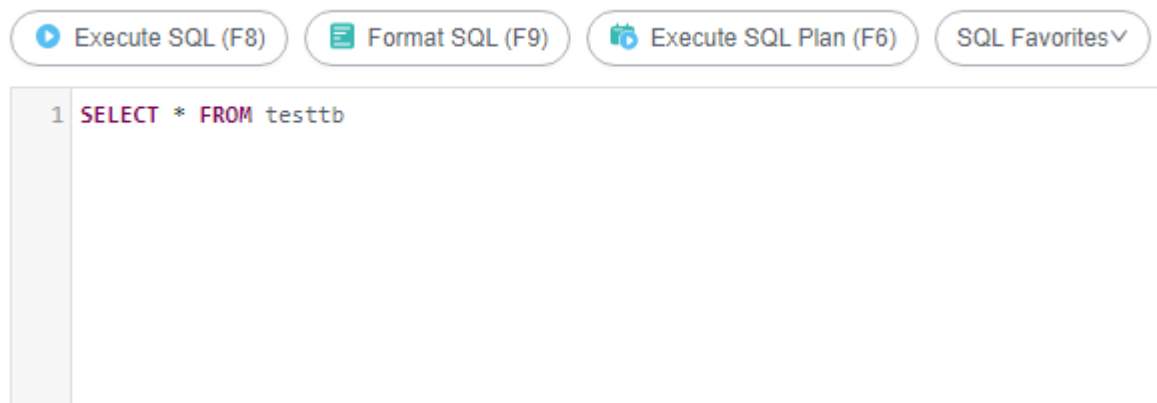
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- Step 7** In the upper left corner of the page, select a database from the drop-down list.

Figure 6-15 Selecting a database



- Step 8** Enter a SQL statement in the SQL window and click **Execute SQL Plan**.

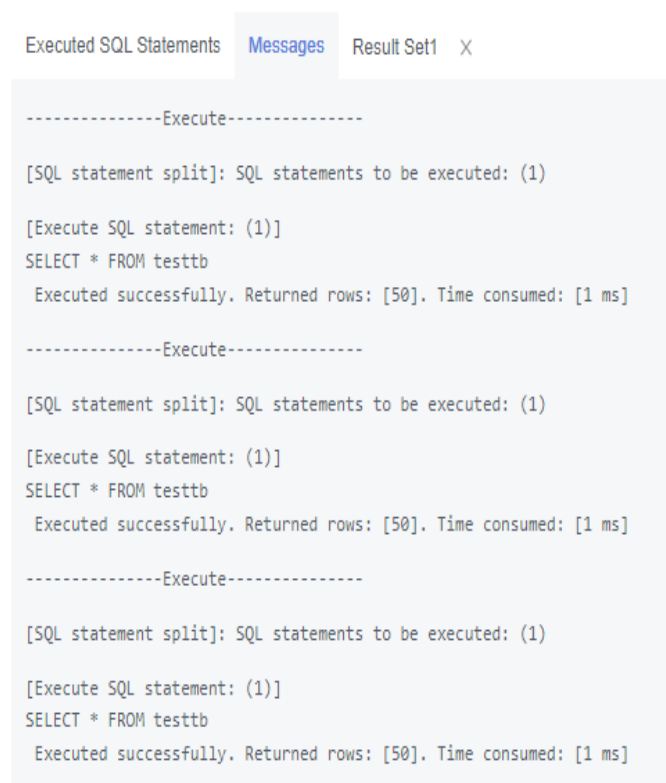
Figure 6-16 Executing SQL plan



Step 9 View the execution plan.

- On the **Messages** tab page, view execution information, including SQL splitting, execution status, and elapsed time.

Figure 6-17 Viewing messages



- On the **Execution Plan** tab page, view SQL execution details. Execution plan details of SQL statements are displayed on different tabs.

Figure 6-18 Viewing the execution plan



----End

6.3.4 SQL Favorites

This section describes how to add frequently-used SQL statements and to view and manage them.

Procedure



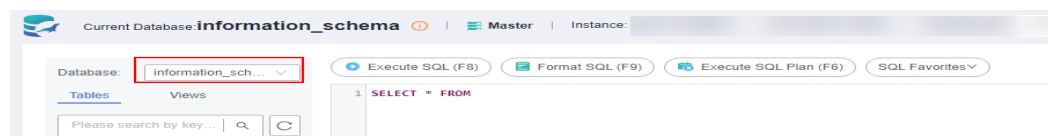
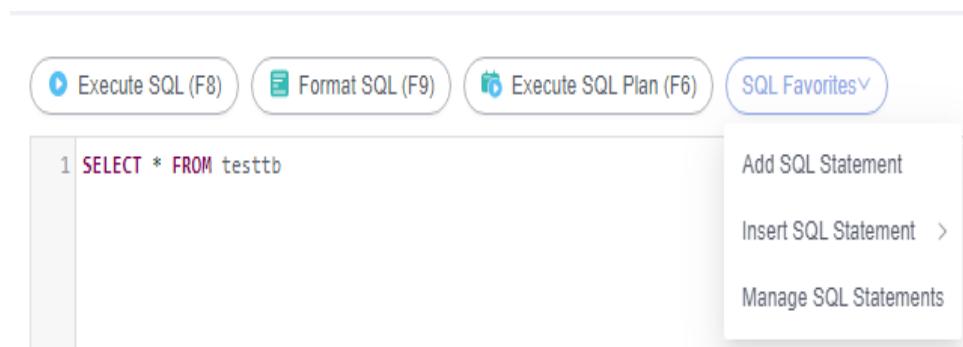
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- Step 7** In the upper left corner of the page, select a database from the drop-down list.

Figure 6-19 Selecting a database



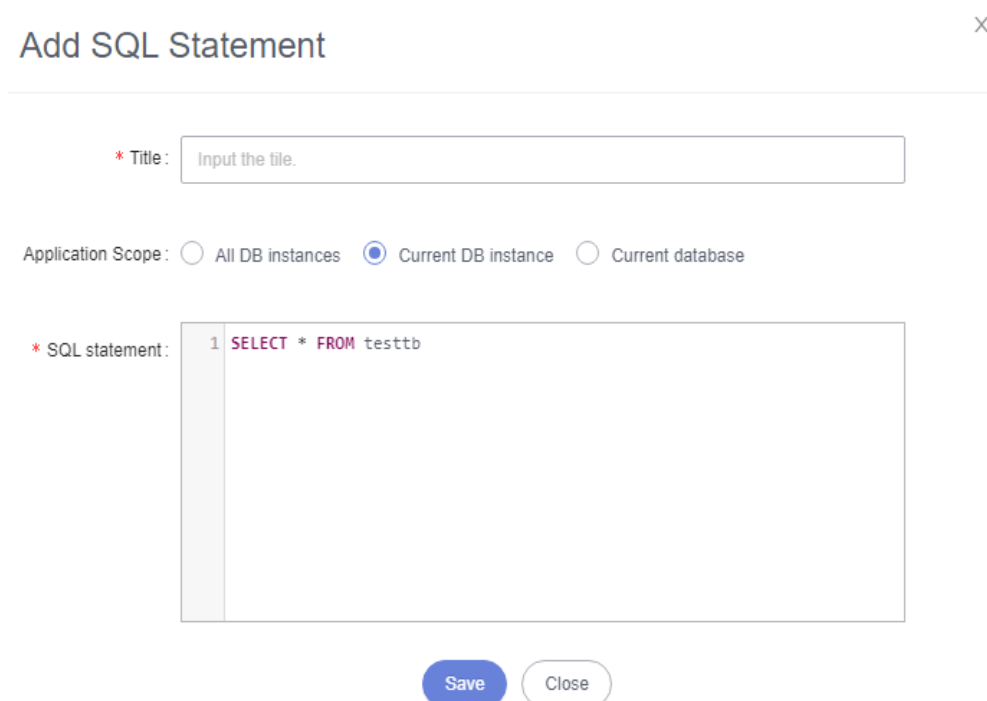
- Step 8** Choose **SQL Favorites**.

Figure 6-20 SQL favorites



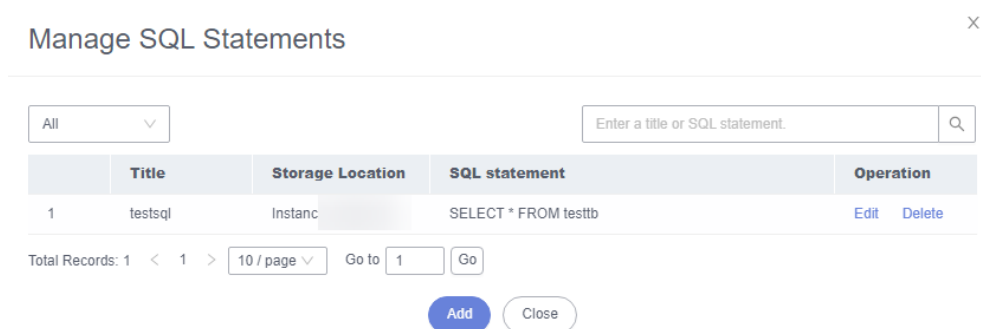
- **Add SQL Statement:** allows you to add frequently-used SQL statements. Specifically, specify a title, select an application scope, enter SQL statements, and then click **Save**.

Figure 6-21 Adding a SQL statement



- **Insert SQL Statement:** allows you to view the SQL statements you have added. If there are no SQL statements stored in your account, this option will not be displayed.
- **Manage SQL Statements:** allows you to manage your SQL statements, including adding, editing, and deleting SQL statements.

Figure 6-22 Managing SQL statements



----End

6.3.5 SQL History

DAS can save the SQL statements you executed in the SQL window for future view. You can also execute the SQL statements again with no need to enter them again in the SQL window.

Prerequisites

You have enabled **Save Executed SQL Statements** in the upper right corner of the **SQL Query** page. After this function is enabled, executed SQL statements will be saved on the DAS management host.


Constraints on Usage

SQL statement execution records can be stored for up to one year.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

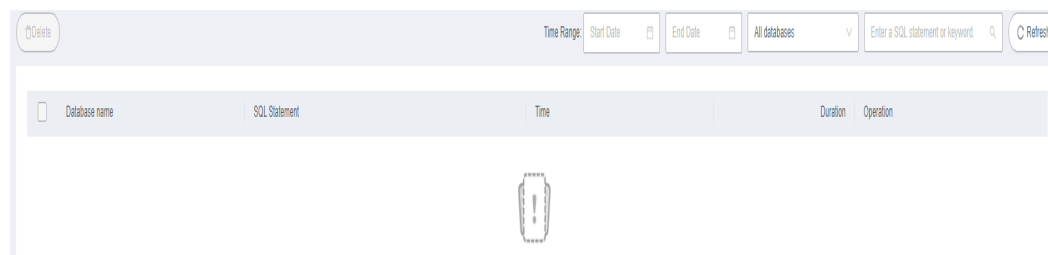
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **SQL Operations > SQL History**.

Step 7 On the displayed page, search for execution information about the target SQL statement by time range, database name, or keyword.

Figure 6-23 Executed SQL statements



- To access the **Database Management** page, click a database name.
- To copy a SQL statement, click it in the **SQL Statement** column.
- To execute a SQL statement, click **Open in SQL window** in the **Operation** column.

----End

6.4 Table Management

6.4.1 Creating a Table

A MariaDB data table consists of basic information, columns, generated columns, indexes, and foreign keys, among which generated columns, indexes, and foreign keys are optional. Configure these items as required.

Procedure



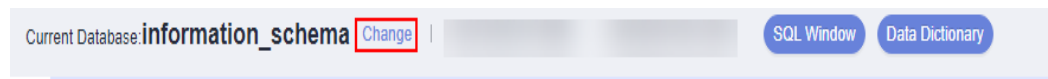
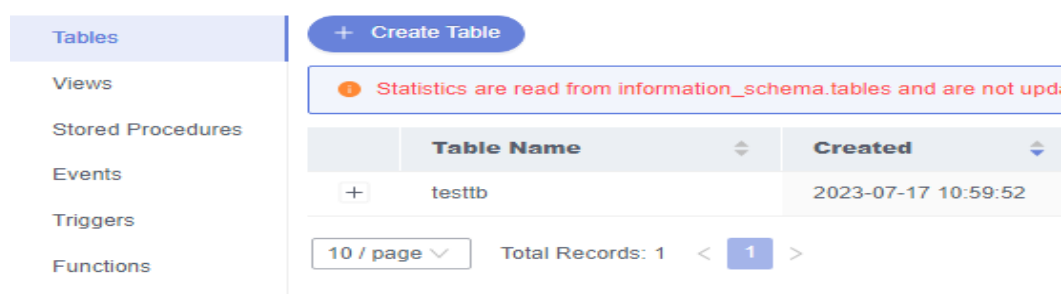
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a table.

Figure 6-24 Switching to another database



- Step 8** Click **Create Table**.

Figure 6-25 Creating a table



- Step 9** Configure basic information as follows:

Enter a table name, specify the storage engine, character set, collation, and enter a comment in sequence. The table name is mandatory.

Figure 6-26 Basic information

1 Basic Information 2 Column

* Table Name

Storage Engine InnoDB

Character Set utf8mb4

Collation utf8mb4_general_ci

Comment

Advanced Settings

Step 10 (Optional) Configure advanced settings.

Specify parameters based on service requirements.

Figure 6-27 Advanced settings

Advanced Settings

Partition Yes No

Partition Definition

Auto Increment Initial Value

Table Space

Row Format

To learn more about partitioned tables, see the following note:

Table partitioning is used to divide a large table into several small tables based on conditions. Different rows in the table can be allocated to different physical partitions. Creating a partitioned table is not recommended because there are many constraints on MariaDB partitioned tables.

If you need to create a partitioned table, you can create one by referring to the following example. The supported partitioning methods are RANGE, LIST, COLUMNS, KEY, and HASH.

For example, if you want to create partitioned table **employees**, enter the following content for **Partition Definition** in the **Advanced Settings** area:

Creating a partitioned table:

```
CREATE TABLE employees (  
  id INT NOT NULL,  
  fname VARCHAR(30),  
  lname VARCHAR(30),  
  hired DATE NOT NULL DEFAULT '1970-01-01',  
  separated DATE NOT NULL DEFAULT '9999-12-31',  
  job_code INT NOT NULL,  
  store_id INT NOT NULL  
)  
PARTITION BY RANGE (store_id) (  
  PARTITION p0 VALUES LESS THAN (6),  
  PARTITION p1 VALUES LESS THAN (11),  
  PARTITION p2 VALUES LESS THAN (16),  
  PARTITION p3 VALUES LESS THAN (21)  
);
```

Specifying a partition definition:

```
PARTITION BY RANGE (store_id) (  
  PARTITION p0 VALUES LESS THAN (6),  
  PARTITION p1 VALUES LESS THAN (11),  
  PARTITION p2 VALUES LESS THAN (16),  
  PARTITION p3 VALUES LESS THAN (21)  
)
```

Step 11 Click **Next**.

Step 12 On the **Column** page, click **Add**.

- Set **Column Name**, **Type**, **Length**, **Nullable**, **Primary Key**, **Comment**, and **Extended Information** as needed.

 **NOTE**

- In the **Type** column, you can select only the parameters from the drop-down list box.
 - In the **Length** column, retain the default value. For some columns whose length is variable, you can change their lengths.
 - If **Primary Key** is selected, **Nullable** will be grayed out.
 - **Auto Increment** can be set for one column only. When it is selected, **Primary Key** must be selected, and no default values can be set.
- If you do not need to add generated columns, indexes, or foreign keys, click **Create** at the bottom of the page. In the displayed **SQL Preview** dialog box, click **Execute**.

Figure 6-28 Configuring field information

- If you need to add generated columns, indexes, and foreign keys, click **Next**. Then, set the column name, type, length, nullable, primary key, expression, storage type, comment, and extended information. To continue to set an index or foreign key for the table, click **Next**.

Figure 6-29 (Optional) Adding virtual columns

Figure 6-30 (Optional) Adding indexes

Figure 6-31 (Optional) Adding foreign keys

NOTE

When you create a foreign key, the type of columns in the referenced table must be the same as that of included columns, and must be the primary key or have a unique index.

Step 13 After the setting is complete, click **Create**.

Step 14 In the **SQL Preview** dialog box, click **Execute**.

----End

6.4.2 Opening a Table

If a table has primary keys, you can add, delete, modify, or query table data as you do in Excel.


Precautions

Data in a table that has no primary keys cannot be edited.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

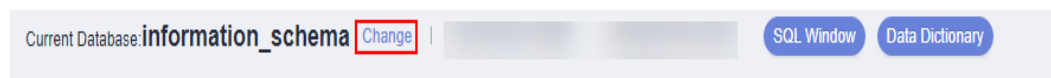
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to open a table.

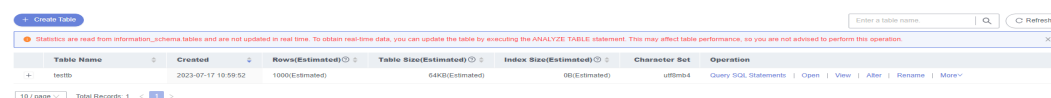
Figure 6-32 Switching to another database



Step 8 On the displayed **Objects** tab, choose **Tables** on the left.

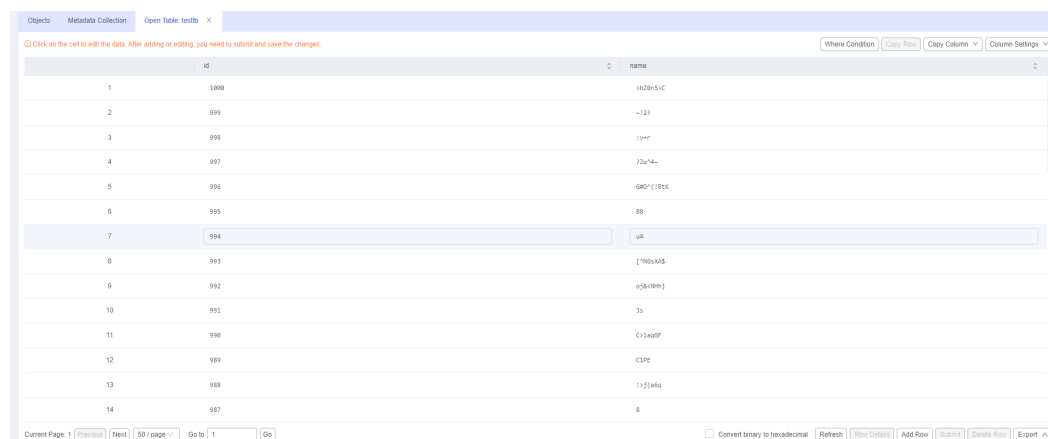
Step 9 Locate the table you want to open and click **Open** in the **Operation** column.

Figure 6-33 Opening a table



Step 10 On the displayed page, view table details.

On the table details page, click a cell to edit data. After adding or editing data, click **Submit** to save the changes.

Figure 6-34 Editing table data

You can also perform operations described in [Table 6-5](#) on the table.

Table 6-5 UI operations

Name	Description
Where Condition	Filters records.
Copy Row	Copies data of the selected row. Specifically, double-click the target row and then click Copy Row .
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.
Column Settings	Allows you to set the columns you want to display.
Convert binary to hexadecimal	Prevents binary data in columns from being displayed as garbled characters. If there is binary data in columns, you must select this option.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.
Add Row	Allows you to add rows.
Submit	Allows you to submit and save the changes to data.
Delete Row	Allows you to delete the selected rows.
Export	Exports a maximum of 10,000 data records to a CSV or SQL file.

----End

6.4.3 Viewing Details of a Table

This section describes how to view basic information of a table and the SQL statement for creating the table.

Procedure



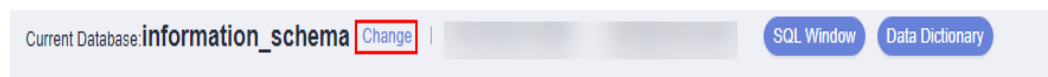
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you view details of a table.

Figure 6-35 Switching to another database



- Step 8** On the displayed **Objects** tab, choose **Tables** on the left. In the table list, locate the table whose details you want to view and click **View** in the **Operation** column.

Figure 6-36 Viewing details of a table

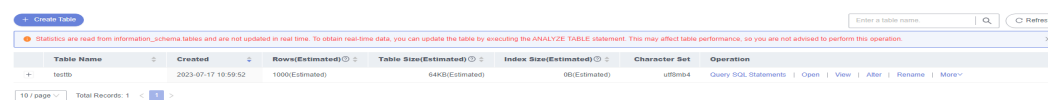
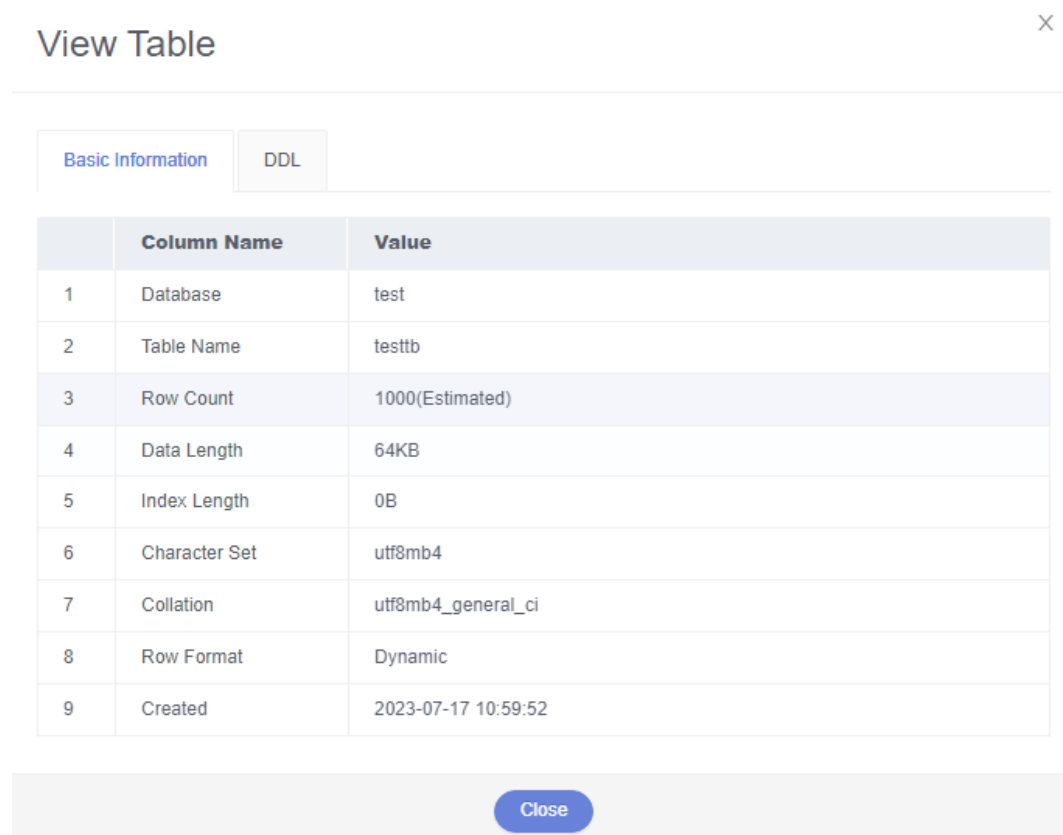
The screenshot shows a table with the following columns: Table Name, Created, Rows(Estimated), Table Size(Estimated), Index Size(Estimated), Character Set, and Operation. The table contains one row with the following data: testtbl, 2023-07-17 10:59:52, 1000(Estimated), 64KB(Estimated), 0B(Estimated), utf8mb4. The Operation column contains a 'View' button.

Table Name	Created	Rows(Estimated)	Table Size(Estimated)	Index Size(Estimated)	Character Set	Operation
testtbl	2023-07-17 10:59:52	1000(Estimated)	64KB(Estimated)	0B(Estimated)	utf8mb4	Query SQL Statement Open View Alter Rename More

- Step 9** In the displayed dialog box, view basic information of the table and the SQL statement for creating the table.

Figure 6-37 Viewing details of a table



	Column Name	Value
1	Database	test
2	Table Name	testtb
3	Row Count	1000(Estimated)
4	Data Length	64KB
5	Index Length	0B
6	Character Set	utf8mb4
7	Collation	utf8mb4_general_ci
8	Row Format	Dynamic
9	Created	2023-07-17 10:59:52

----End



6.4.4 Altering a Table

After a table is created, you can alter information of the table, including basic information, columns, generated columns, indexes, and foreign keys.

Usage Notes

Improper alterations on a table will cause instance or service exceptions.

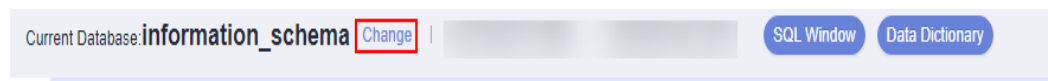
Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to alter a table.

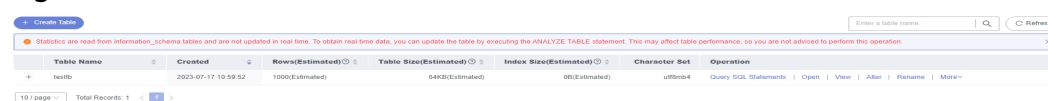
Figure 6-38 Switching to another database



Step 8 On the displayed **Objects** tab, choose **Tables** on the left.

Step 9 In the right pane, locate the table that you want to alter and click **Alter** in the **Operation** column.

Figure 6-39 Table list



Step 10 Open the page for modifying the table and modify table information. For details, see [Creating a Table](#).

Step 11 Click **Alter**.

Step 12 In the **SQL Preview** dialog box, click **Execute**.

----End


6.4.5 Renaming a Table

This section describes how to rename a table.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

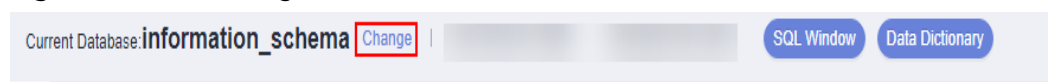
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

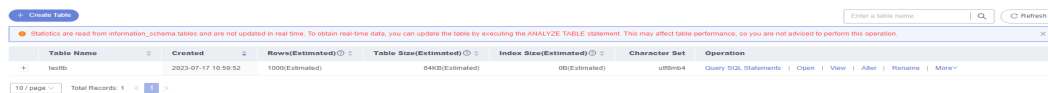
Step 7 Click **Change** on the right of the current database to switch to the database where you want to rename a table.

Figure 6-40 Switching to another database



- Step 8** On the displayed **Objects** tab, choose **Tables** on the left.
- Step 9** In the right pane, locate the table that you want to rename and click **Rename** in the **Operation** column.

Figure 6-41 Renaming a table



- Step 10** In the displayed dialog box, enter a new table name and click **OK**.
- End

6.4.6 Clearing a Table

This section describes how to clear data in a table.

Precautions

Cleared tables cannot be recovered. Exercise caution when performing this operation.

Procedure



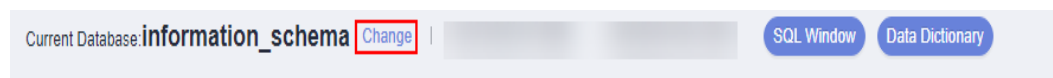
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to clear a table.

Figure 6-42 Switching to another database



- Step 8** On the displayed **Objects** tab, choose **Tables** on the left.
- Step 9** In the right pane, locate the table you want to clear and choose **More > Clear** in the **Operation** column.

Figure 6-43 Clearing a table



Step 10 In the displayed dialog box, click **Yes**.

----End

6.4.7 Dropping a Table

This section describes how to drop a table that is no longer needed.


Precautions

Dropped tables cannot be recovered. Exercise caution when performing this operation.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to drop a table.

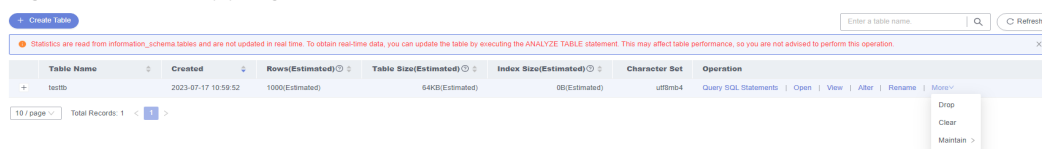
Figure 6-44 Switching to another database



Step 8 On the displayed **Objects** tab, choose **Tables** on the left.

Step 9 In the right pane, locate the table that you want to drop and choose **More > Drop** in the **Operation** column

Figure 6-45 Dropping a table



Step 10 In the displayed dialog box, click **Yes**.

----End

6.4.8 Maintaining a Table

While working with MariaDB databases, you do a lot of changes such as data insert, update, and deletion, which may cause table fragmentation. As a result, the database server performance is deteriorated. To handle this, periodic maintenance is required.

Functions


Table 6-6 Function description

Function	Description
Check	<p>Allows you to check whether there are errors in database tables using the CHECK TABLE statement. You can check a table with any of the following methods: Check, Quick, Fast, Changed, and Extended. The CHECK TABLE statement adds a read-only lock to the table.</p> <ul style="list-style-type: none">• Check: scans rows to verify that deleted links are valid. Alternatively, calculate a key checksum for the rows and verifies the validity using the obtained checksum.• Quick: checks only the tables that have not been closed properly.• Fast: neither scans rows nor checks for incorrect links.• Changed: checks only the tables that have been changed since the last check and the tables that have not been closed properly.• Extended: searches for keywords in each row. This ensures that the table is 100% consistent, but takes a long time.
Repair	<p>Allows you to use the REPAIR TABLE statement to repair possibly corrupted or incorrect tables. You can repair tables using any of the following three methods: Check, Quick, and Extended.</p> <ul style="list-style-type: none">• Check: a simple repair, which repairs data and index files.• Quick: the quickest repair, which repairs only index files, but not data files.• Extended: the slowest repair, which creates indexes row by row to repair data and index files.

Checking a Table

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

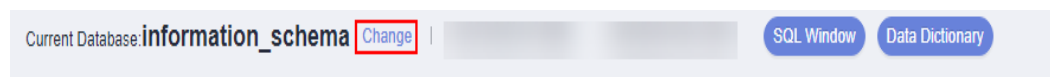
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to check a table.

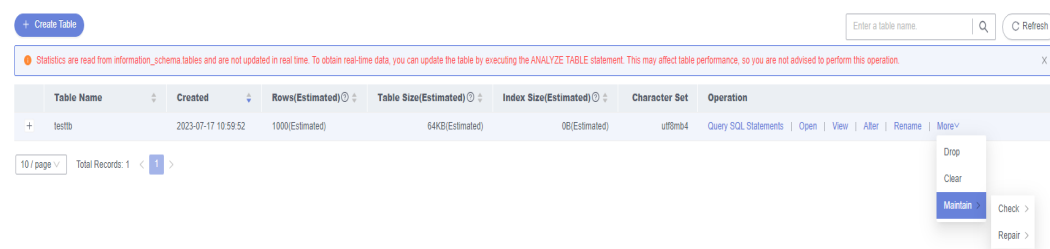
Figure 6-46 Switching to another database



Step 8 On the displayed **Objects** tab, choose **Tables** on the left.

Step 9 Locate the table you want to check and choose **More > Maintain > Check** in the **Operation** column.

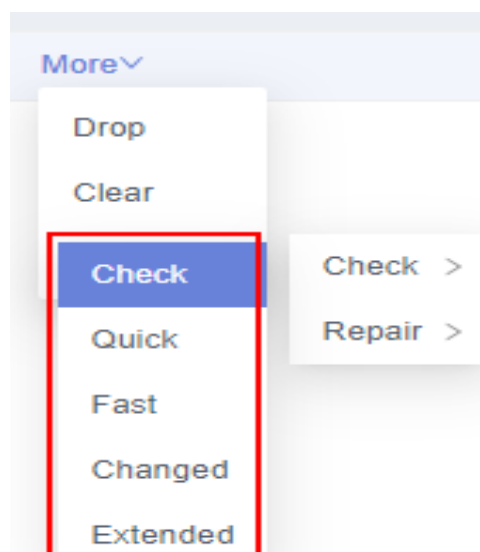
Figure 6-47 Checking a table



Step 10 Select a check method as required.

You can check a table with any of the following methods: **Check**, **Quick**, **Fast**, **Changed**, and **Extended**.

Figure 6-48 Selecting a check method




Step 11 In the displayed dialog box, click **Yes**.

----End

Repairing a Table

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to repair a table.

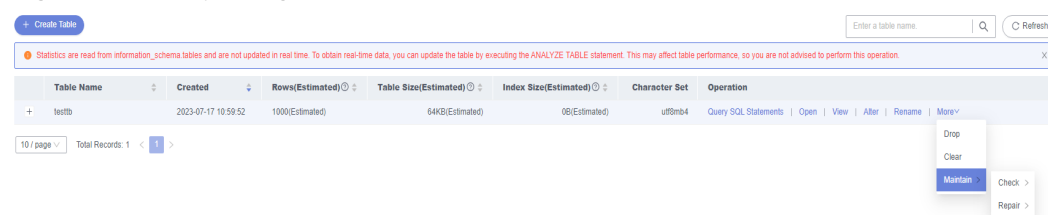
Figure 6-49 Switching to another database



Step 8 On the displayed **Objects** tab, choose **Tables** on the left.

Step 9 Locate the table you want to repair and choose **More > Maintain > Repair** in the **Operation** column.

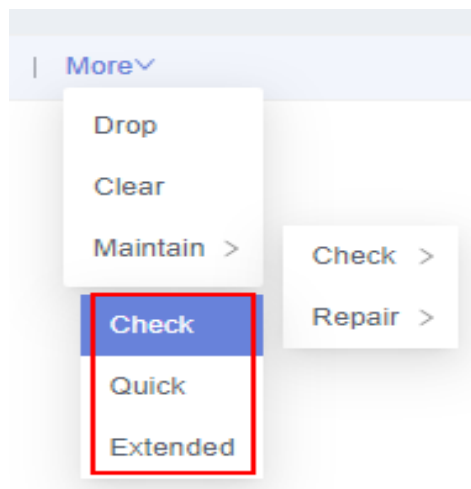
Figure 6-50 Repairing a table



Step 10 Select a repair method as required.

You can repair tables using any of the following three methods: **Check**, **Quick**, and **Extended**.

Figure 6-51 Selecting a repair method



- Step 11** In the displayed dialog box, click **Yes**.
----End

6.5 View Management

6.5.1 Creating a View

This section describes how to create a view on the DAS console.

Procedure



- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a view.

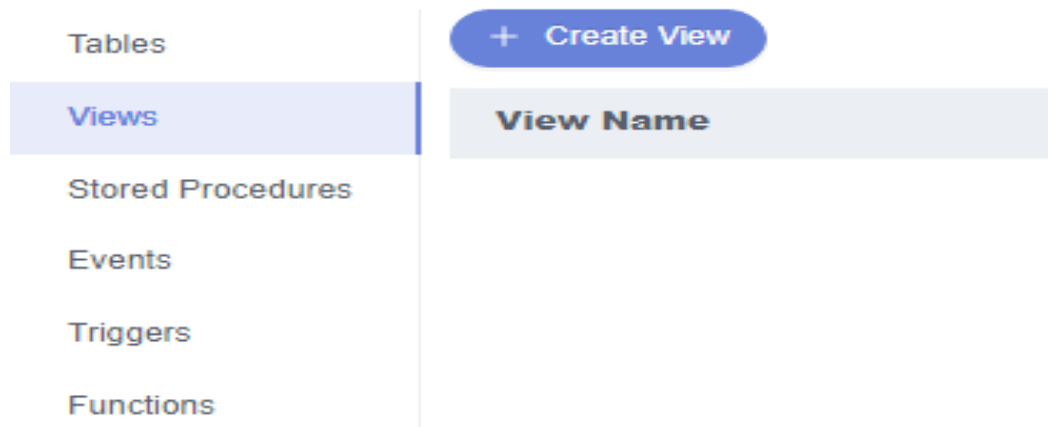
Figure 6-52 Switching to another database



Step 8 On the **Objects** tab page, choose **Views**.

Step 9 Click **Create View**.

Figure 6-53 Creating a view



Step 10 On the displayed page, specify information such as view name, security, check option, and algorithm from drop-down lists as required, and click **Create**.

Figure 6-54 Creating a view



Table 6-7 Parameter description

Parameter	Description
View Name	(Mandatory) Enter a view name.
Definer	Enter a definer.
Algorithm	<p>(Optional) You can leave this parameter blank or set it to MERGE, TEMPTABLE, or UNDEFINED.</p> <ul style="list-style-type: none"> • UNDEFINED: The required algorithm is automatically selected. • MERGE: A combination algorithm. Executing this algorithm will combine and execute SQL statements of the view and those of the external query view. • EMPTABLE: The result is stored in a temporary table for query.

Parameter	Description
Security	(Optional) You can leave this parameter blank or set it to DEFINER or INVOKER . <ul style="list-style-type: none">• DEFINER: When the view is executed, the user account specified by DEFINER will be used to check access privileges for the view.• INVOKER: When the view is executed, the user account specified by INVOKER will be used to check access privileges for the view.
Check Option	(Optional) You can leave this parameter blank or set it to LOCAL or CASCADED . <ul style="list-style-type: none">• If you select CASCADED for Check Option, the view that the current view depends on will also have the check option.• If you select LOCAL for Check Option, the system checks whether the view that the current view depends on has check options. If yes, the system checks the view that the current view depends on. If no, the system does not check the view.
View Definition Statement	Enter a SQL statement for creating the view. You only need to enter the SELECT part.

Step 11 In the dialog box, confirm the SQL scripts.

- If the information is correct, click **Execute**.
- If you need to modify the information, click **Back**.

Step 12 Check whether that the created view appears in the view list.

----End

6.5.2 Opening a View

This section describes how to view details of a view on the DAS console.


Precautions

View do not have primary keys and their data can only be queried.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

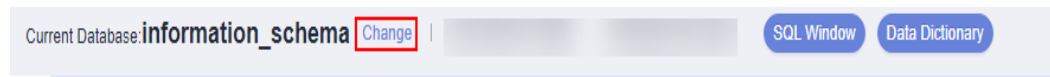
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

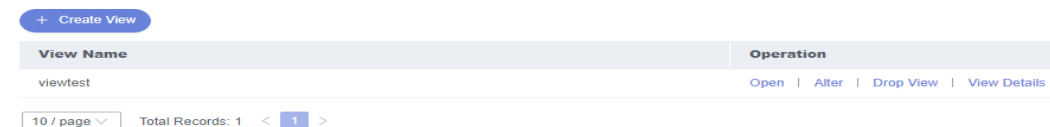
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to open a view.

Figure 6-55 Switching to another database



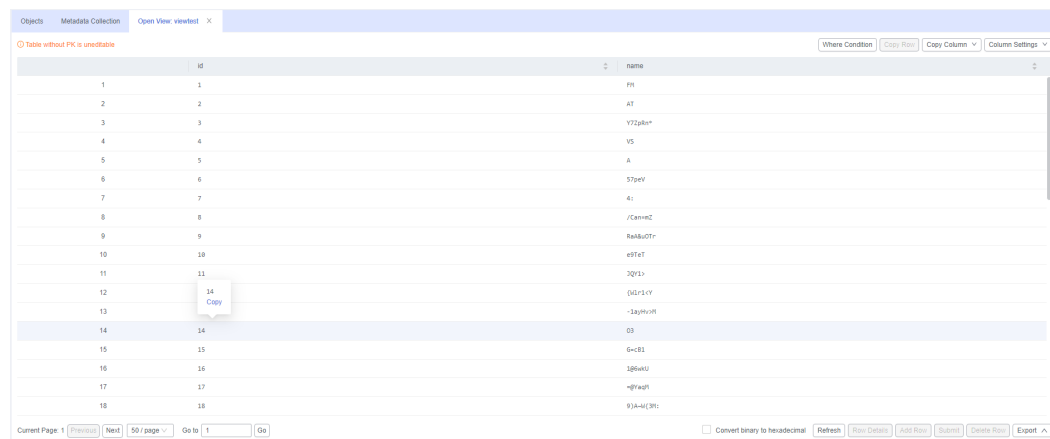
- Step 8** On the displayed **Objects** page, choose **Views**. In the right pane, locate the view that you want to open and click **Open** in the **Operation** column.

Figure 6-56 Opening a view



- Step 9** View data in the current view.

Figure 6-57 Viewing details of a view



You can also perform operations described in **Table 6-8** on the view.

Table 6-8 UI operations

Name	Description
Where Condition	Filters records.
Copy Row	Allows you to copy data of a selected row. Specifically, select the row you want to copy and click Copy Row .

Name	Description
Copy Column	Allows you to copy data of a selected column. Specifically, click Copy Column and select a column from the drop-down list.
Copy	Allows you to copy a piece of data. Specifically, hover the cursor on the data and click Copy .
Column Settings	Allows you to set the columns you want to display.
Convert binary to hexadecimal	Prevents binary data in columns from being displayed as garbled characters. If there is binary data in columns, you must select this option.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.
Export	Exports a maximum of 10,000 data records to a CSV or SQL file.

----End

6.5.3 Altering a View

This section describes how to modify the definition, security, and algorithm of a view on the DAS console.

Usage Notes

Improper alterations on a view will cause instance or service exceptions.

Procedure



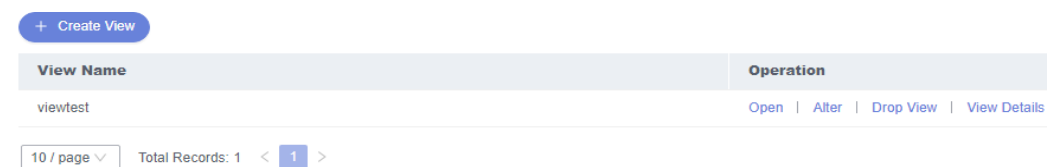
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to alter a view.

Figure 6-58 Switching to another database

Step 8 On the displayed **Objects** page, choose **Views**. In the right pane, locate the view that you want to alter and click **Alter** in the **Operation** column.

Figure 6-59 Altering a view

Step 9 On the displayed page, modify information of the view, including the security, algorithm, and definition.

Figure 6-60 Editing a view

Step 10 Click **Alter** at the bottom of the page.

Step 11 In the dialog box, confirm the SQL scripts.

- If the information is correct, click **Execute**.
- If you need to modify the information, click **Back**.

----End

6.5.4 Dropping a View

This section describes how to drop a view that is no longer needed.


Precautions

Dropped views cannot be recovered. Exercise caution when performing this operation.

Procedure

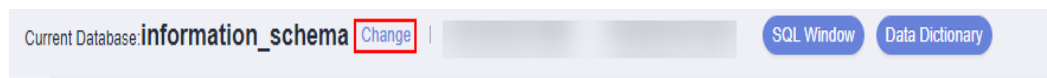
Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

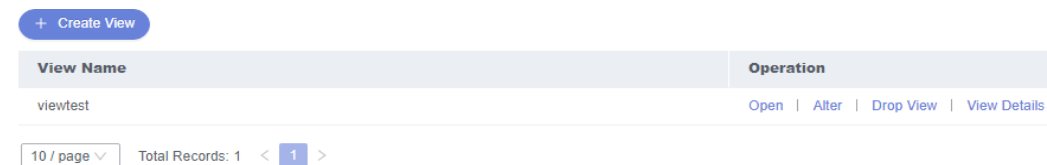
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to drop a view.

Figure 6-61 Switching to another database



- Step 8** On the displayed **Objects** page, choose **Views**. In the right pane, locate the view that you want to drop and click **Drop View** in the **Operation** column.

Figure 6-62 Dropping a view



- Step 9** In the displayed dialog box, click **Yes**.

----End

6.5.5 Viewing Details of a View

This section describes how to view details of a view, which show the SQL statement for creating it.

Procedure



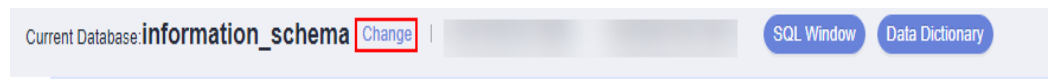
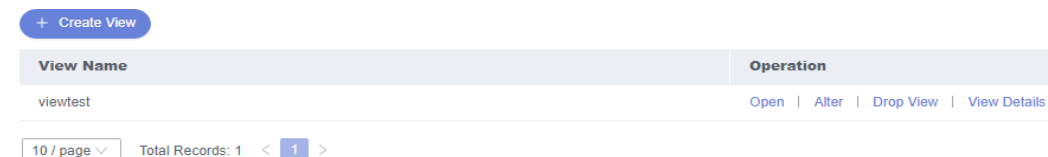
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to view details of a view.

Figure 6-63 Switching to another database

Step 8 On the displayed **Objects** tab, choose **Views** on the left. In the right pane, locate the view whose details you want to view and click **View Details** in the **Operation** column.

Figure 6-64 Viewing details of a view

Step 9 In the displayed dialog box, view the SQL statement for creating the view.
----End

6.6 Stored Procedure Management

6.6.1 Creating a Stored Procedure

A stored procedure is a set of SQL statements used to implement specific functions. After being compiled, stored procedures are stored in databases. You can execute the stored procedures by specifying their names and related parameters.

A stored procedure consists of a set of SQL statements that can complete specific tasks or process complex services. This section describes how to create a stored procedure. You can use loop statements in a stored procedure to insert objects repeatedly.


Prerequisites

- You have obtained the CREATE ROUTINE permission.
- You have obtained the EXECUTE permission.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

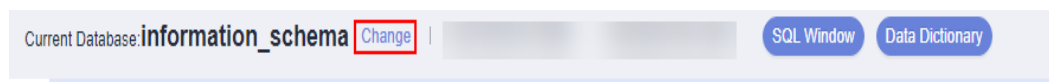
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

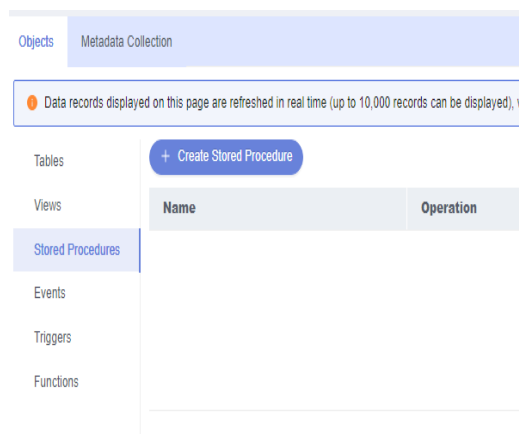
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a stored procedure.

Figure 6-65 Switching to another database



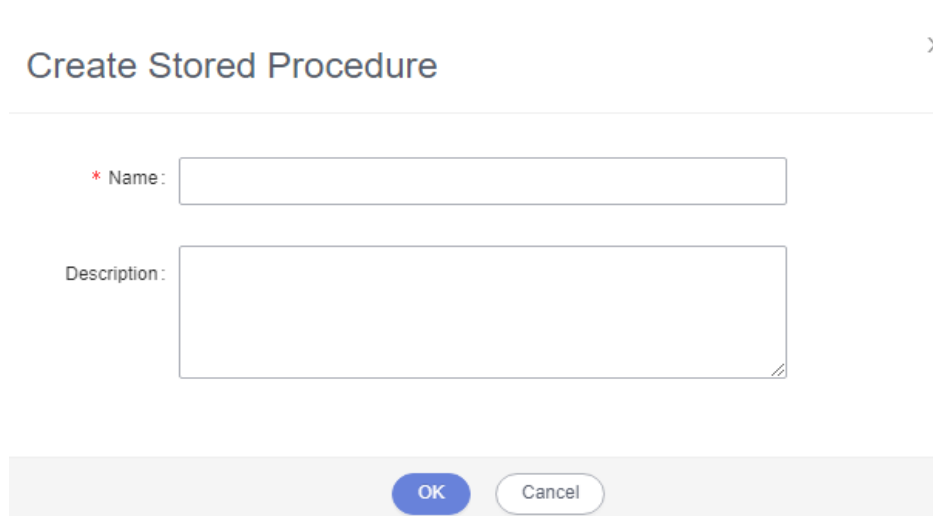
- Step 8** On the displayed **Objects** page, select **Stored Procedures**. In the upper left corner of the page, click **Create Stored Procedure**.

Figure 6-66 Creating a stored procedure



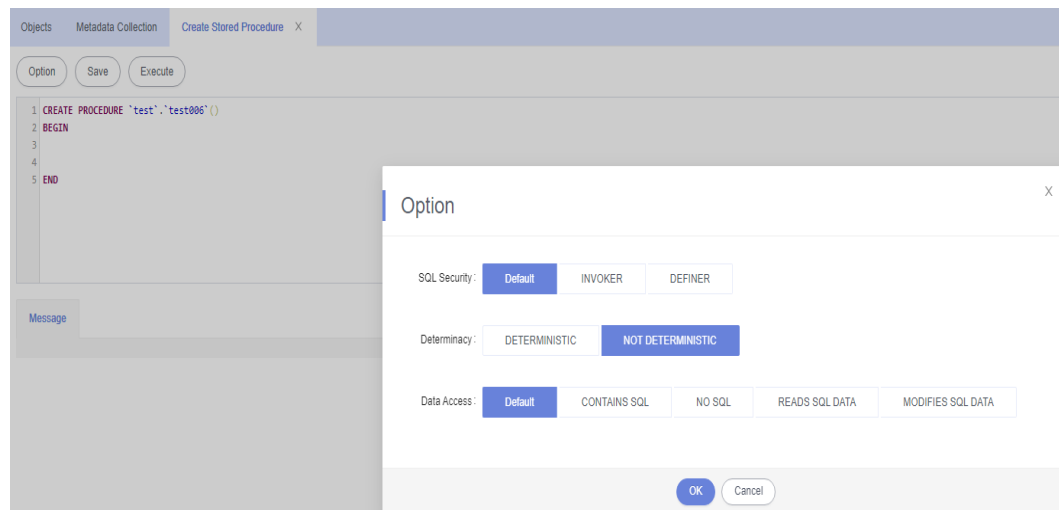
- Step 9** In the displayed dialog box, enter a stored procedure name and description and click **OK**.

Figure 6-67 Specifying stored procedure information



- Step 10** Click **Option** in the upper left corner. In the displayed dialog box, set option parameters based on service requirements.

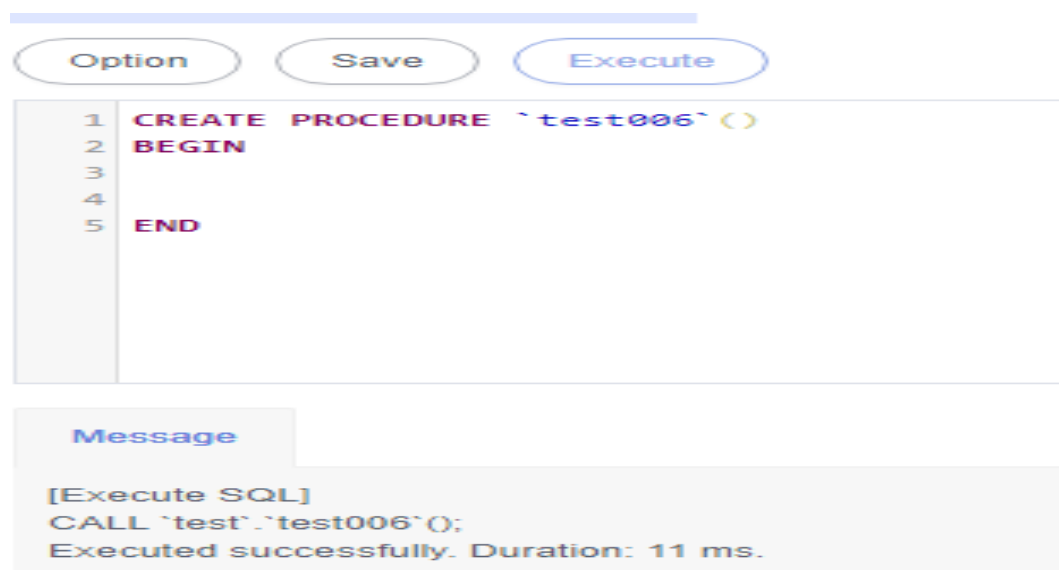
Figure 6-68 Setting parameters



Step 11 After setting the option parameters, save or execute the stored procedure.

Step 12 View the execution status in the **Message** area.

Figure 6-69 Viewing the execution of the stored procedure



----End

6.6.2 Altering or Executing a Stored Procedure

This section describes how to alter or execute a stored procedure on the DAS console.

Usage Notes

Improper alterations on a stored procedure will cause instance or service exceptions.

Procedure



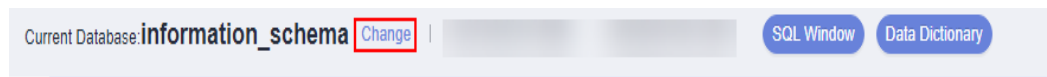
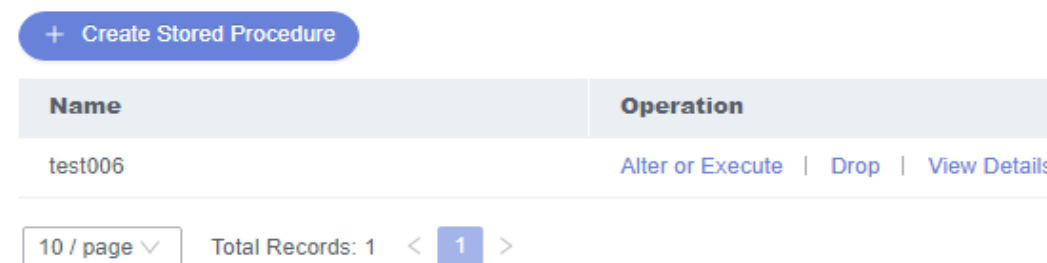
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to alter or execute a stored procedure.

Figure 6-70 Switching to another database



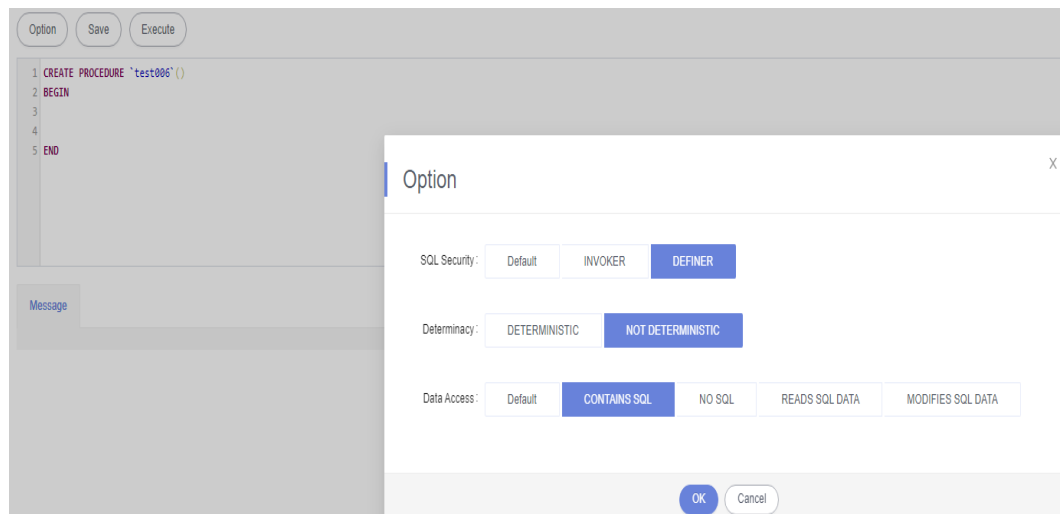
- Step 8** On the displayed **Objects** page, choose **Stored Procedures**. In the right pane, locate the stored procedure you want to alter or execute and click **Alter or Execute** in the **Operation** column.

Figure 6-71 Altering or executing a stored procedure



- Step 9** On the displayed page, click **Option** and set parameters. Click **OK** and then click **Save**.

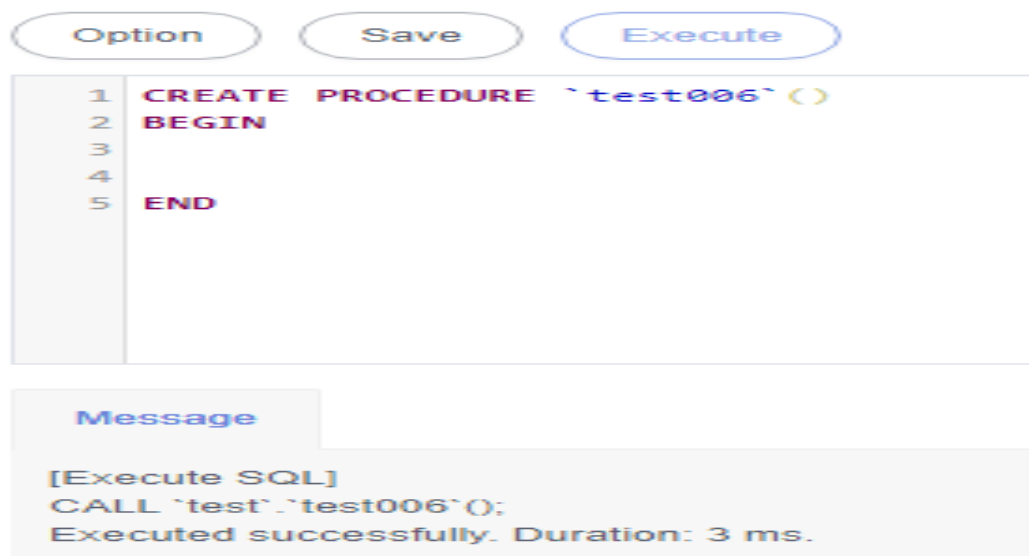
Figure 6-72 Specifying stored procedure information



Step 10 Click **Execute**.

Step 11 View the execution status in the **Message** area.

Figure 6-73 Viewing the execution of the stored procedure



----End

6.6.3 Dropping a Stored Procedure

This section describes how to drop a stored procedure that is no longer needed.

Precautions

Dropped stored procedures cannot be recovered. Exercise caution when performing this operation.

Procedure



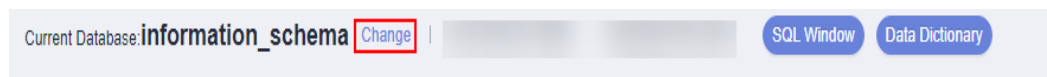
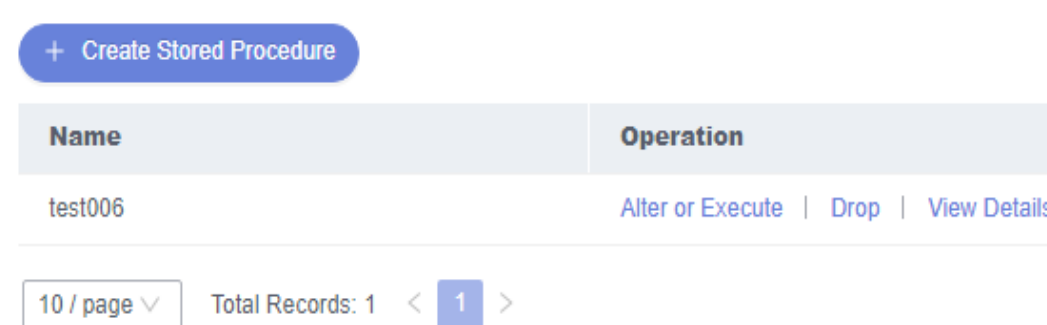
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to drop a stored procedure.

Figure 6-74 Switching to another database



- Step 8** On the displayed **Objects** page, choose **Stored Procedures**. In the right pane, locate the stored procedure you want to drop and click **Drop** in the **Operation** column.

Figure 6-75 Dropping a stored procedure



- Step 9** In the displayed dialog box, click **Yes**.

----End

6.6.4 Viewing Details of a Stored Procedure

This section describes how to view details of a stored procedure on the DAS console. The details show the SQL statement for creating the stored procedure.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)



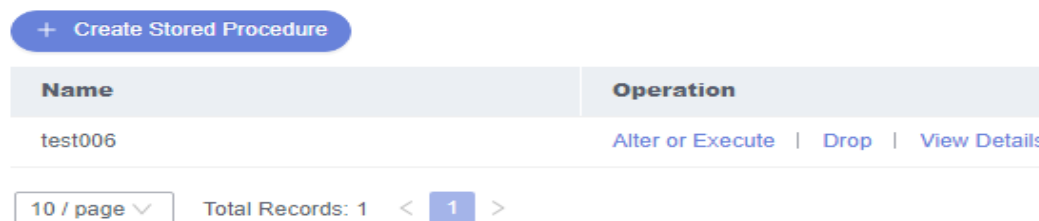
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to view details of a stored procedure.

Figure 6-76 Switching to another database



- Step 8** On the **Objects** tab page, choose **Stored Procedures**.
- Step 9** Locate the stored procedure whose details you want to view and click **View Details** in the **Operation** column.

Figure 6-77 Viewing details of a stored procedure



- Step 10** In the displayed dialog box, view the SQL statement for creating the stored procedure.

----End

6.7 Event Management

6.7.1 Creating an Event

This section describes how to create an event to periodically respond to specific operations.

Precautions


- If you set **event_scheduler** to **ON** and enable the event function, you can manage events.

- If you set **event_scheduler** to **OFF**, you can create events but the events do not take effect even if the event function is enabled.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

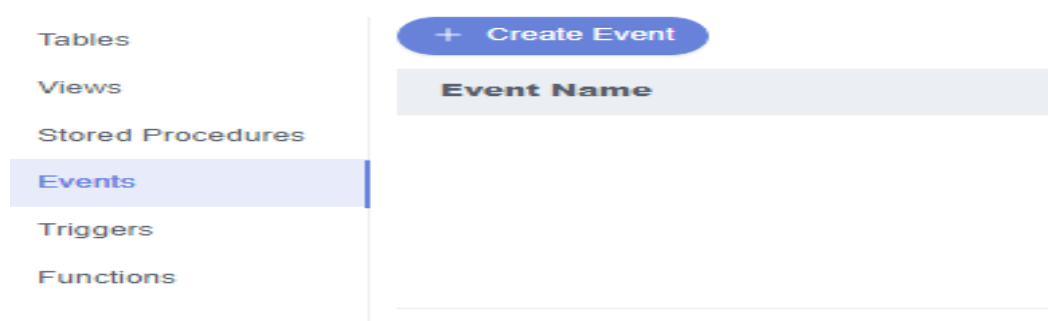
Step 7 Click **Change** on the right of the current database to switch to the database where you want to create an event.

Figure 6-78 Switching to another database



Step 8 On the displayed **Objects** page, select **Events**. In the upper left corner of the page, click **Create Event**.

Figure 6-79 Creating an event



Step 9 Enter an event name (mandatory) and event definition statements (mandatory), set the execution time, status, and comment, and click **Create**.

Figure 6-80 Event details

Basic Information

* Event Name: Execution Time:

Dropped upon expiration

Status:

Comment:

* Event Definition Statements:

```
1 begin
2
3 /**event body**/
4
5 end
```

- **Event Definition Statements**
Indicates the SQL statements to be executed when a scheduled event is triggered.
- **Dropped upon expiration**
 - Indicates that the events to be executed at a fixed point in time will be deleted after they are executed.
 - Indicates that the events to be periodically executed will be deleted at the specified end time.

Step 10 In the displayed dialog box, click **Execute**.

If there are no errors reported, the event takes effect.

----End



6.7.2 Altering an Event

This section describes how to alter the name, status, execution time, and definition statement of an event on the DAS console.

Usage Notes

Improper alterations on an event will cause instance or service exceptions.

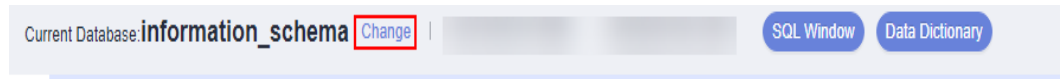
Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to alter an event.

Figure 6-81 Switching to another database



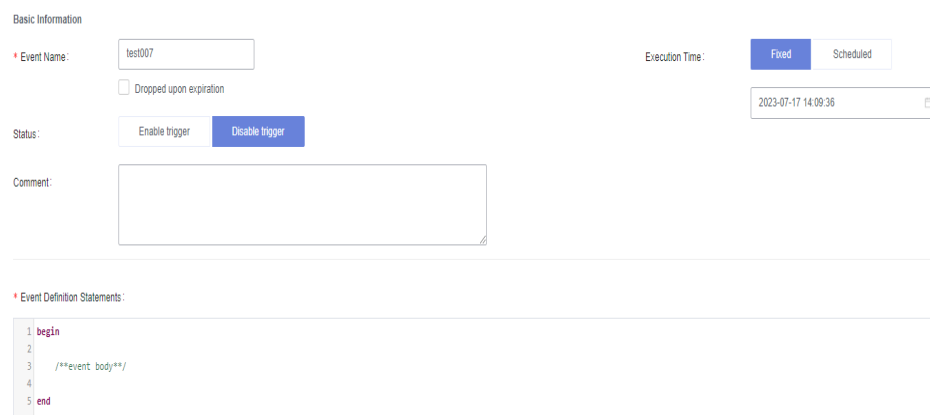
Step 8 On the displayed **Objects** page, choose **Events**. In the right pane, locate the event that you want to alter and click **Alter** in the **Operation** column.

Figure 6-82 Altering an event

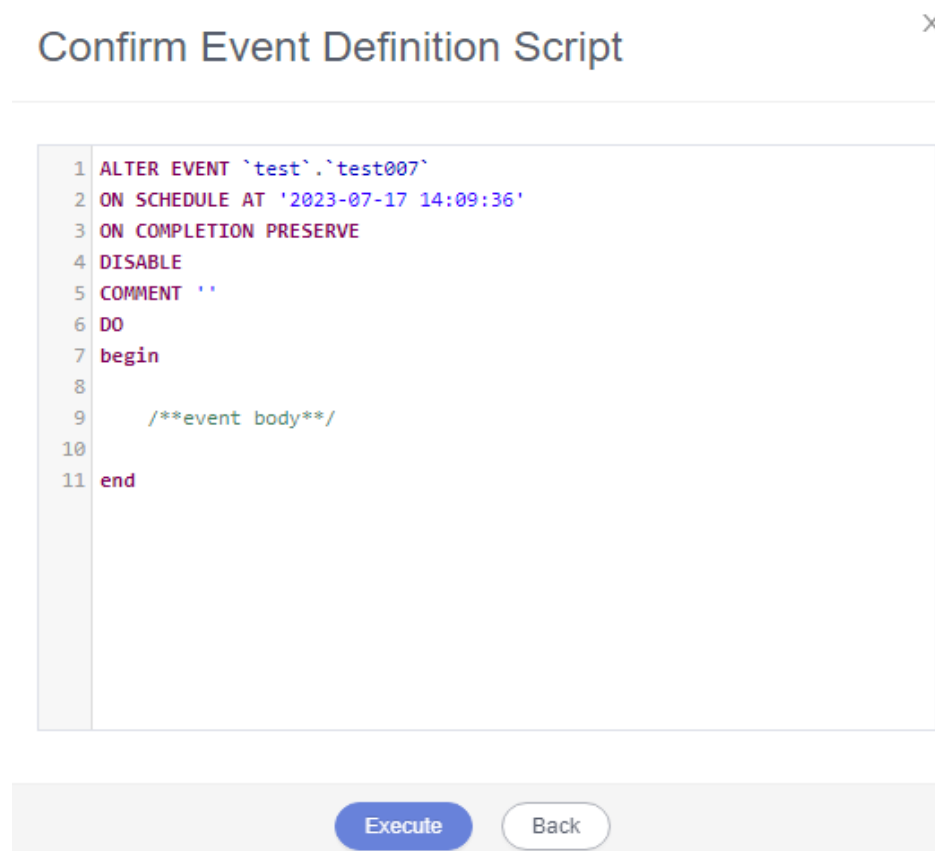


Step 9 On the displayed page, modify the required information and click **Alter**.

Figure 6-83 Altering event information



Step 10 In the displayed dialog box, click **Execute**.

Figure 6-84 Event script

----End



6.7.3 Dropping an Event

This section describes how to drop an event that is no longer needed.

Precautions

Dropped events cannot be recovered. Exercise caution when performing this operation.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

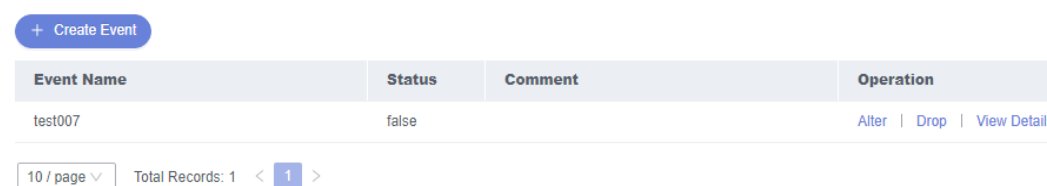
Step 7 Click **Change** on the right of the current database to switch to the database where you want to drop an event.

Figure 6-85 Switching to another database



Step 8 On the displayed **Objects** page, choose **Events**. In the right pane, locate the event you want to drop and click **Drop** in the **Operation** column.

Figure 6-86 Dropping an event



Step 9 In the displayed dialog box, click **Yes**.

----End


6.7.4 Viewing Details of an Event

This section describes how to view details of an event on the DAS console. The details show the SQL statement for creating the event.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

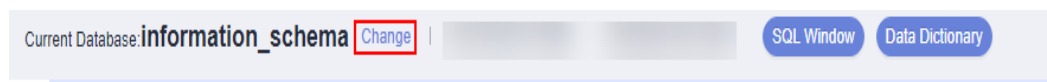
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.


Step 7 Click **Change** on the right of the current database to switch to the database where you want to view details of an event.

Figure 6-87 Switching to another database



Step 8 On the displayed **Objects** tab, choose **Events** on the left. In the right pane, locate the event whose details you want to view and click **View Details** in the **Operation** column.

Figure 6-88 Viewing details of an event



Event Name	Status	Comment	Operation
test007	false		Alter Drop View Details

10 / page Total Records: 1 < 1 >

Step 9 In the displayed dialog box, view the SQL statement for creating the event.
----End

6.8 Trigger Management

6.8.1 Creating a Trigger

This section describes how to create a trigger on the DAS console. A trigger is a set of SQL statements stored in the database catalog. Whenever an event associated with a table occurs, a SQL trigger is executed or fired to insert, update, or delete data.

Procedure



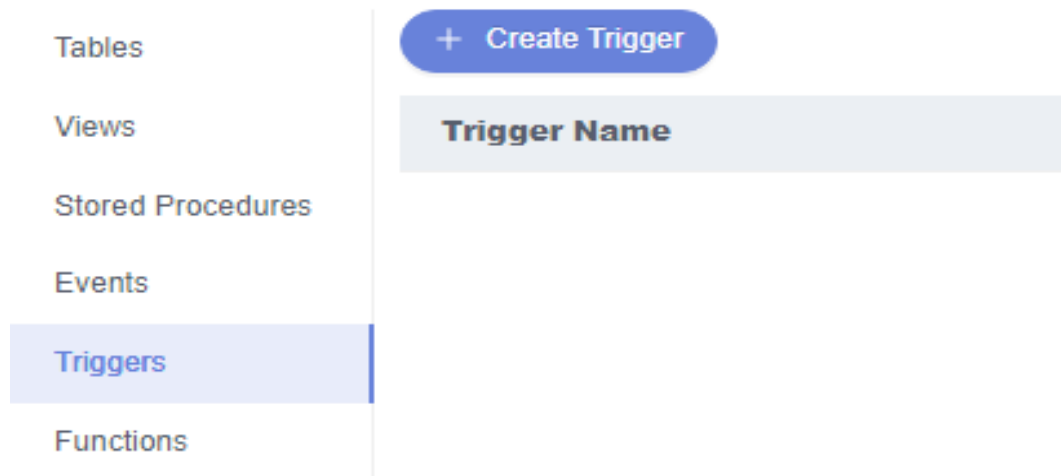
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a trigger.

Figure 6-89 Switching to another database



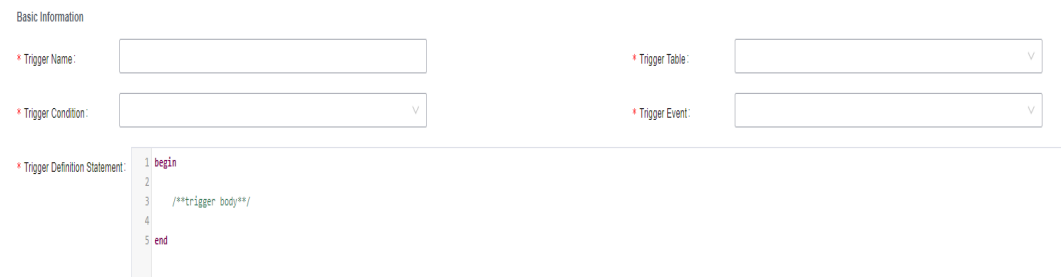
Step 8 On the displayed **Objects** page, choose **Triggers**. In the upper left corner of the page, click **Create Trigger**.

Figure 6-90 Creating a trigger



Step 9 On the displayed page, set required parameters and edit trigger definition statements. Then, click **Create**.

Figure 6-91 Specifying trigger information



Step 10 In the displayed dialog box, click **Execute**.

Figure 6-92 Confirming the script



6.8.2 Altering a Trigger

This section describes how to alter the name, table, condition, and event of a trigger as well as the SQL statement for defining the trigger on the DAS console.

Usage Notes

Improper alterations on a trigger will cause instance or service exceptions.

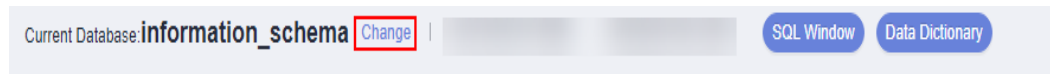
Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

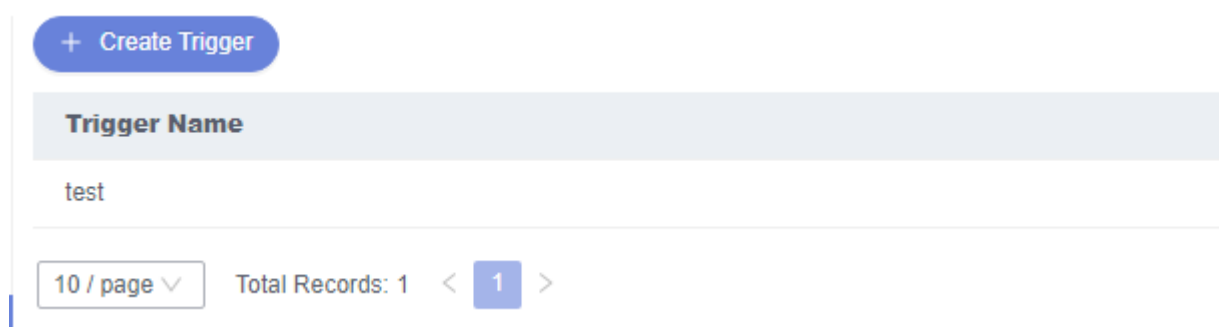
Step 7 Click **Change** on the right of the current database to switch to the database where you want to alter a trigger.

Figure 6-93 Switching to another database



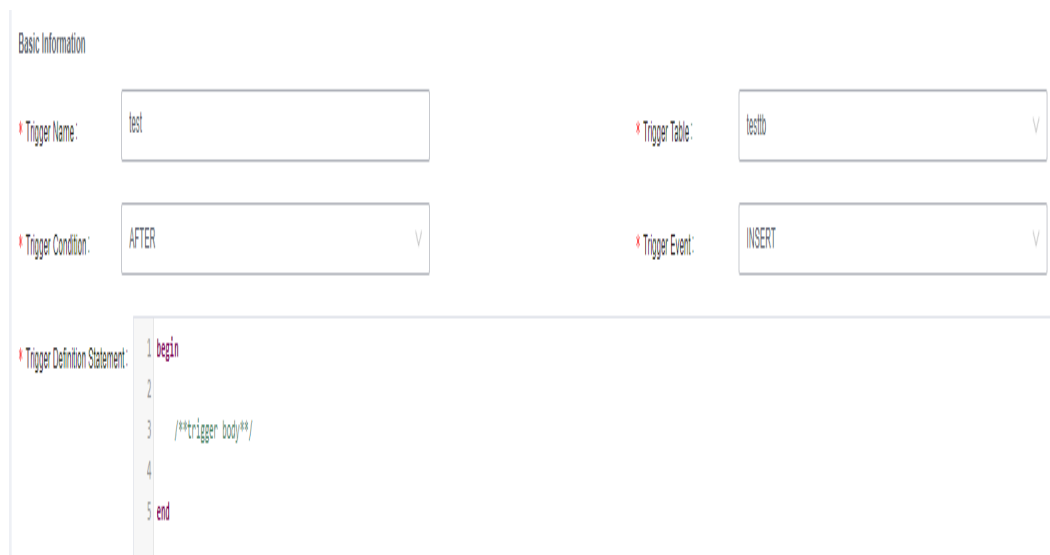
Step 8 On the displayed **Objects** page, select **Triggers**. In the right pane, locate the trigger you want to alter and click **Alter** in the **Operation** column.

Figure 6-94 Altering a trigger



Step 9 On the displayed page, modify the required parameters and click **Alter**.

Figure 6-95 Altering trigger information



Step 10 In the displayed dialog box, click **Execute**.

----End

6.8.3 Dropping a Trigger

This section describes how to drop a trigger that is no longer needed.

Precautions

Dropped triggers cannot be recovered. Exercise caution when performing this operation.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to drop a trigger.

Figure 6-96 Switching to another database



- Step 8** On the displayed **Objects** page, select **Triggers**. In the right pane, locate the trigger you want to drop and click **Drop Trigger** in the **Operation** column.

Figure 6-97 Dropping a trigger



- Step 9** In the displayed dialog box, click **Yes**.

----End

6.8.4 Viewing Details of a Trigger

This section describes how to view details of a trigger on the DAS console. The details show the SQL content for creating the trigger.

Procedure



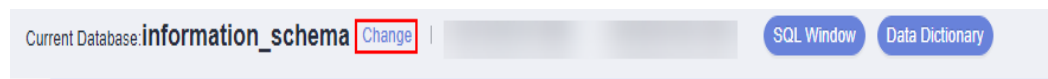
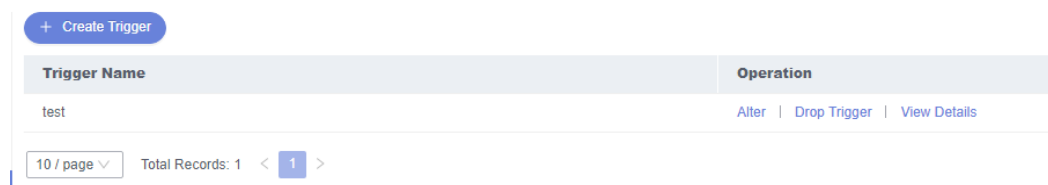
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to view details of a trigger.

Figure 6-98 Switching to another database



- Step 8** On the displayed **Objects** tab, choose **Triggers** on the left. In the right pane, locate the trigger whose details you want to view and click **View Details** in the **Operation** column.

Figure 6-99 Viewing details of a trigger



- Step 9** In the displayed dialog box, view the SQL statement for creating the trigger.
----End

6.9 Function Management

6.9.1 Creating a Function

Functions can improve modularity of applications and code reusability. This section describes how to create a function on the DAS console.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)



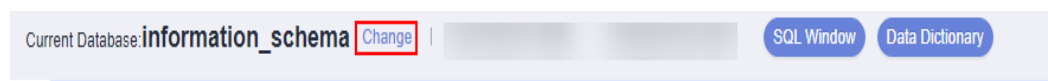
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to create a function.

Figure 6-100 Switching to another database



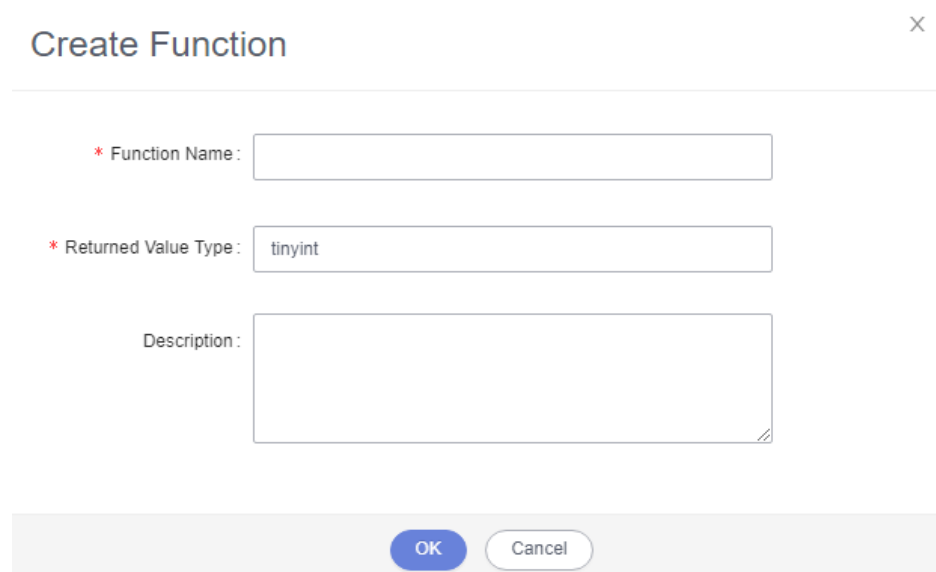
- Step 8** On the displayed **Objects** page, select **Functions**. In the upper left corner of the page, click **Create Function**.

Figure 6-101 Creating a function



- Step 9** In the displayed dialog box, enter a function name, returned value type, and description, and click **OK**.

Figure 6-102 Specifying function information



Create Function ×

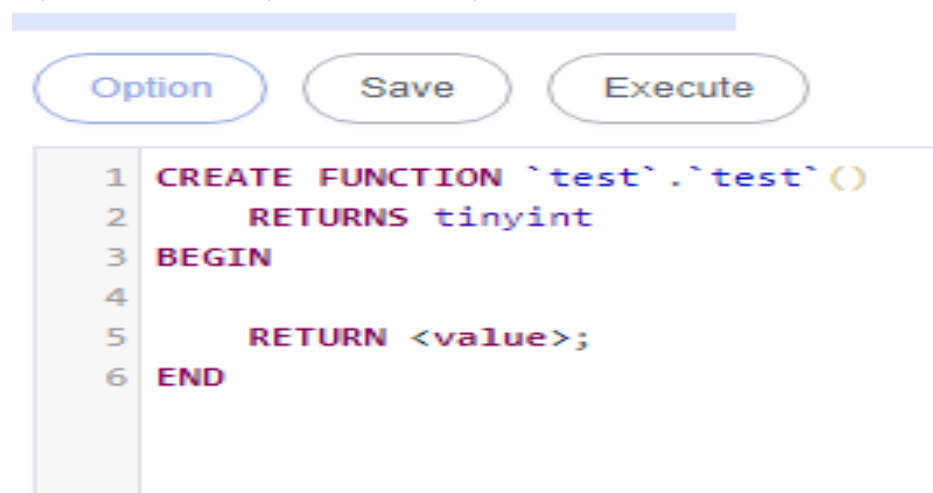
* Function Name:

* Returned Value Type:

Description:

Step 10 On the displayed page, edit the function body.

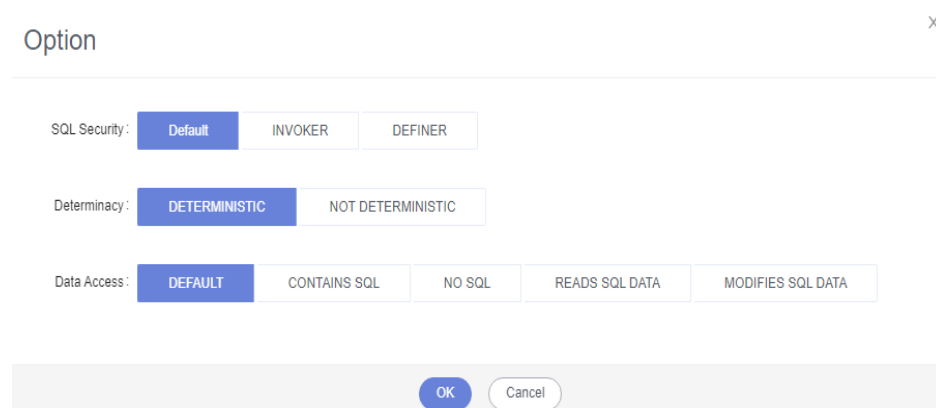
Figure 6-103 Editing a function body



```
1 CREATE FUNCTION `test`.`test`()
2 RETURNS tinyint
3 BEGIN
4
5 RETURN <value>;
6 END
```

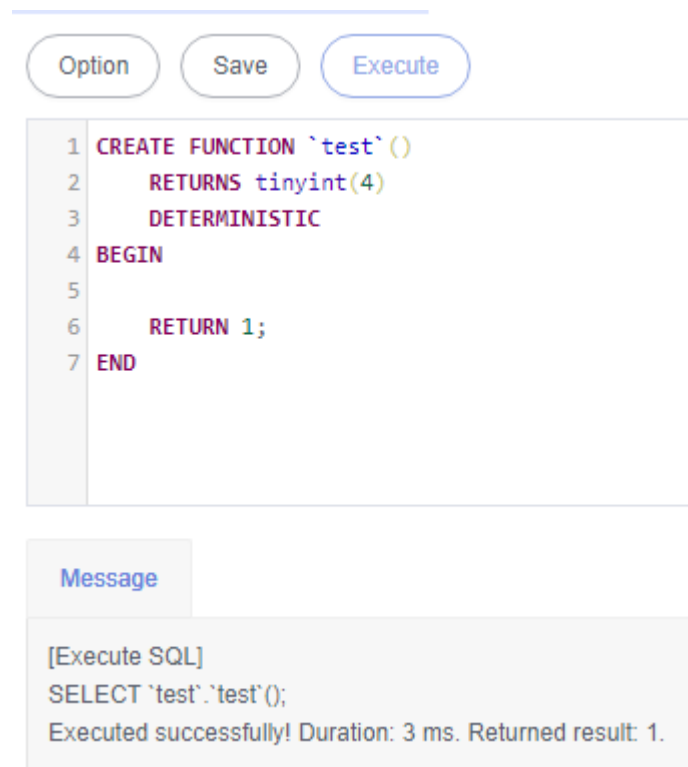
Step 11 In the upper left corner, click **Option**. In the displayed dialog box, set required parameters and click **OK**.

Figure 6-104 Setting required parameters



Step 12 Click **Save** or **Execute** and view the status in the **Message** area.

Figure 6-105 Executing a function



----End

6.9.2 Altering or Executing a Function

This section describes how to alter or execute a function on the DAS console.

Usage Notes

Improper alterations on a function will cause instance or service exceptions.

Procedure



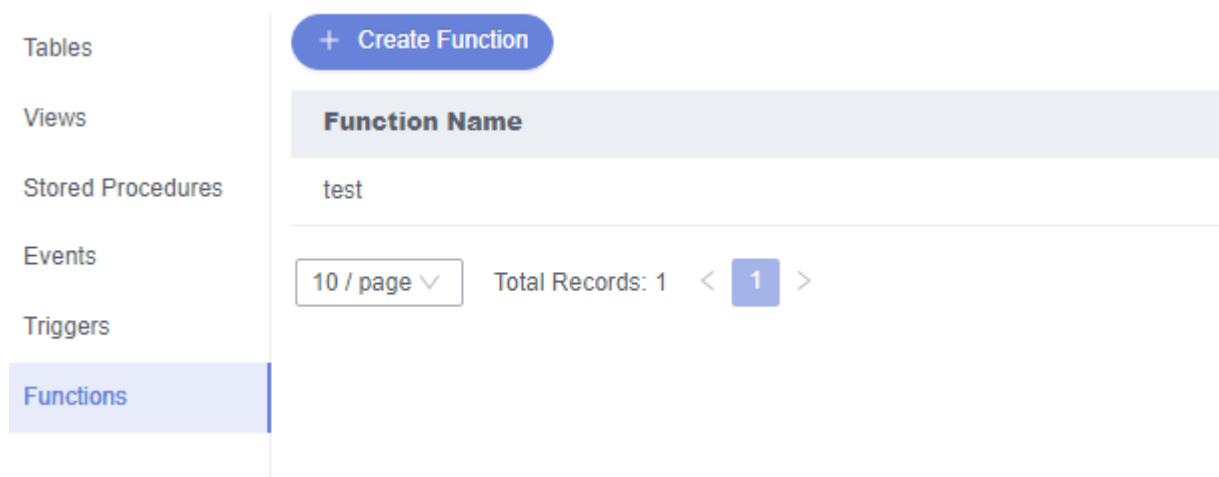
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to alter or execute a function.

Figure 6-106 Switching to another database

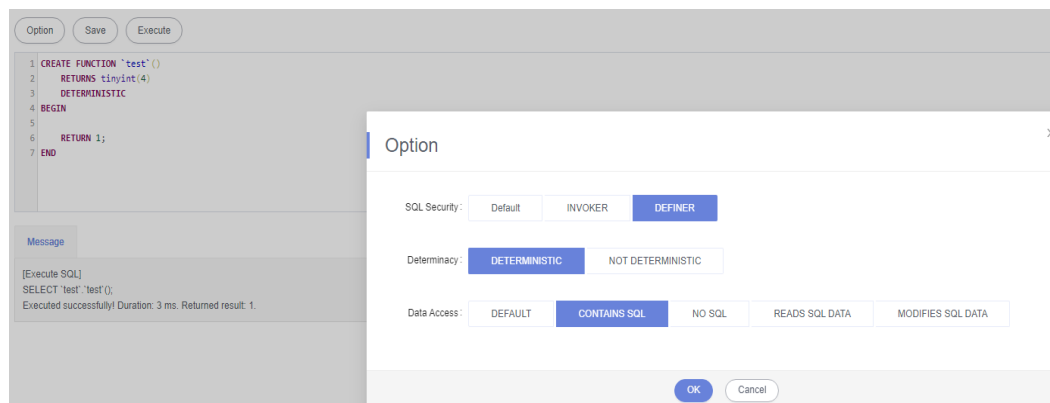


- Step 8** On the **Objects** page, select **Functions**. In the right pane, locate the function you want to alter or execute and click **Alter or Execute** in the **Operation** column.

Figure 6-107 Altering or executing a function



- Step 9** On the displayed page, click **Option** and set parameters as required. Then, click **Save** to save the settings or click **Execute**.

Figure 6-108 Altering a function

----End

6.9.3 Dropping a Function

This section describes how to drop a function that is no longer needed.

Precautions

Dropped functions cannot be recovered. Exercise caution when performing this operation.

Procedure



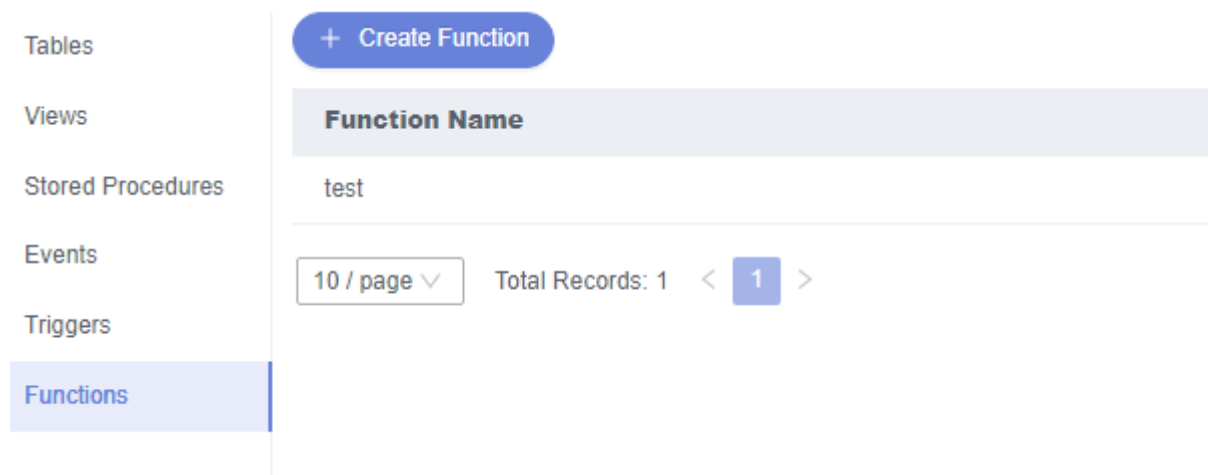
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** Click **Change** on the right of the current database to switch to the database where you want to drop a function.

Figure 6-109 Switching to another database

- Step 8** On the **Objects** page, select **Functions**. In the right pane, locate the function you want to drop and click **Drop** in the **Operation** column.

Figure 6-110 Dropping a function

Step 9 In the displayed dialog box, click **Yes**.

----End


6.9.4 Viewing Details of a Function

This section describes how to view details of a function on the DAS console. The details show the SQL statement for creating the function.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

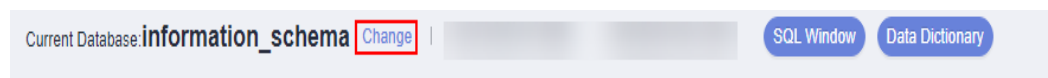
Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

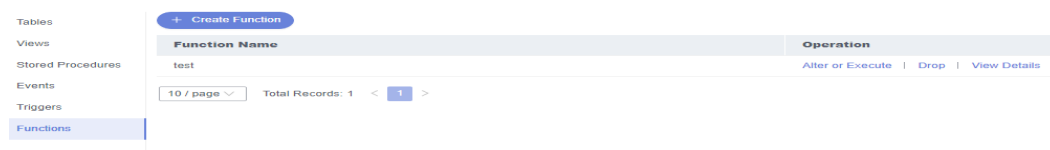
Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Click **Change** on the right of the current database to switch to the database where you want to view details of a function.

Figure 6-111 Switching to another database

Step 8 On the displayed **Objects** tab, choose **Functions** on the left. In the right pane, locate the function whose details you want to view and click **View Details** in the **Operation** column.

Figure 6-112 Viewing details of a function

Step 9 In the displayed dialog box, view the SQL statement for creating the function.

----End

6.10 Data Import and Export

6.10.1 Importing Data

This section describes how to import data from your local PC or an OBS bucket for data backup and migration.


Usage Notes

- Import data into a table for backup or migration. If you import a CSV or SQL file, the file must have the same data type as the target table.
- Only one file that is no larger than 1 GB can be imported at a time.
- Only data files in the CSV or SQL format can be imported. If the number of instance tables exceeds 10,000, the CSV format cannot be used.
- Binary fields such as BINARY, VARBINARY, TINYBLOB, BLOB, MEDIUMBLOB, and LONGBLOB are not supported.
- The size of a single SQL statement to be imported must be less than 100 MB.
- Only OBS buckets of the current IAM account can be imported.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Import**.

Step 7 Click **Create Task**.

Figure 6-113 Creating an import task

Create Task
×

Import Type

sql
CSV

File Source

Upload file
Choose from OBS

Attachment Storage ?

5257 v

Bucket ACL Info

No OBS bucket? [Create OBS Bucket](#)

Creating an OBS bucket is free of charge, but storing files in it will incur fees.

+
 Click here to upload a file, or drag one here. (.sql)

Upload only one attachment that is no larger than 1 GB.

Database

prd v

Charset

UTF8
GBK
Auto Detetct

Options

Ignore errors, that is, skip the step where the SQL statement fails to be executed.

Delete the uploaded file upon an import success.

Remarks

Create
Cancel

Table 6-9 Parameter description

Parameter	Description
Import Type	Set Import Type to sql or CSV .

Parameter	Description
File Source	<p>Import a file from your local PC or an OBS bucket.</p> <ul style="list-style-type: none">• Upload file If you select Upload file for File Source, you need to set Attachment Storage and upload the required file. To keep your data secure, provide your own OBS bucket to store the file you uploaded. In this way, DAS automatically connects to your OBS bucket for in-memory reading. No data is stored on DAS. Creating OBS buckets is free of charge, but saving files will incur certain costs. If you select Delete the uploaded file upon an import success, the file you uploaded will be automatically deleted from the OBS bucket after being imported to the destination database.• Choose from OBS If you select Choose from OBS for File Source, you need to select a file from the bucket. The file uploaded from an OBS bucket will not be deleted upon an import success.
Attachment Storage	<p>Select an OBS bucket to store the file. Click Bucket ACL Info to check whether a public OBS bucket is selected.</p> <ul style="list-style-type: none">• SAFE: The bucket ACL permission set does not contain ALL USERS.• WARN: The bucket ACL permission set contains ALL USERS.• UNKNOWN: The bucket ACL permission set is unknown, maybe due to the lack of IAM permissions. You are advised to go to the OBS page to view the bucket ACL configuration.
Database	Select the database that you want to import the file to.
Charset	Select a charset as needed.
Options	<p>If you select Ignore errors, that is, skip the step where the SQL statement fails to be executed, the system will skip any errors detected when SQL statements are being executed.</p> <p>If you select Delete the uploaded file upon an import success, the file you uploaded will be automatically deleted from the OBS bucket after being imported to the destination database. This option is only available to the files uploaded from your local PC.</p>
Remarks	Enter remarks as required.

Step 8 After setting import parameters, click **Create**.

Confirm the information again before you click **OK** because original data may be overwritten after data import.

Step 9 On the displayed page, view import progress in the task list.

Click **Details** in the **Operation** column to view task details.

----End

6.10.2 Exporting Data

DAS allows you to export a large amount of data at a time to facilitate data query or to back up data for migration. This section describes how to export data.

DAS allows you to export an entire database, some data tables, or result sets of SQL statements.

Usage Notes

- If you do not select **Generate a file for each table** when exporting data, the exported data file is in **.zip** format. Data files in this format cannot be directly imported. You need to decompress the file before importing it again.
- If **Generate a file for each table** is selected during data export, the exported data file is in **.sql** or **.csv** format. In this case, the exported data file can be directly imported again.
- If the **Exporting a Database** function is used to export over 10,000 instance tables, an error message will be displayed indicating that the number of tables is too large and data cannot be exported. In this case, use the **Exporting SQL Results** function instead.
- Only OBS buckets of the current IAM account can be exported.


Prerequisites

You have created a user database on the DAS console. For details, see [Creating a Database](#).

Exporting a Database

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

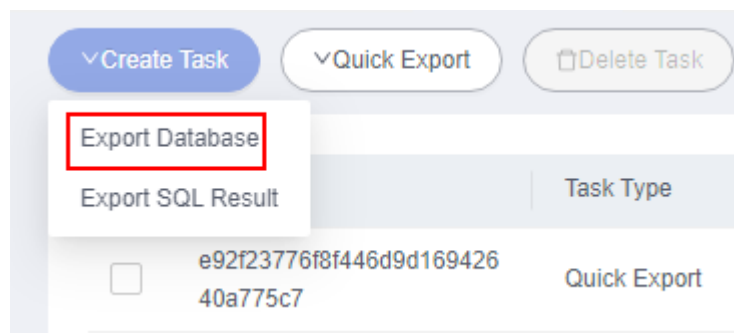
Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

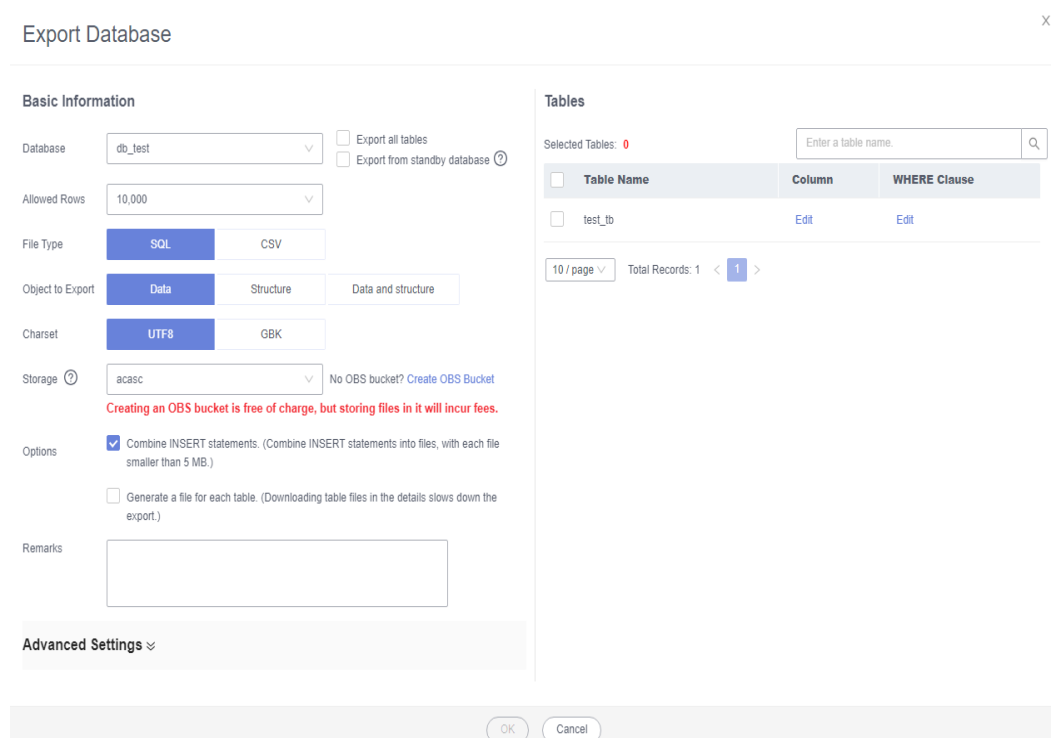
Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

Step 7 In the upper left corner of the page, click **Create Task** and choose **Export Database**.

Figure 6-114 Creating a task for exporting a database

Step 8 In the displayed dialog box, configure basic information and advanced settings as required.

Figure 6-115 Creating a task for exporting a database

- If you select **Export all tables**, data in an entire database or in specific tables will be exported.
- Databases are classified into user databases and system databases. System database cannot be exported. If system database data is required, deploy system database services in a user database, so that you can export the system database data from the user database.
- DAS connects to your standby database to export data. This prevents the primary database from being affected by data export. However, if the standby database has a high replication delay, the exported data may not be the latest.
- DAS does not store any user data. The exported data files are stored in the OBS bucket that you have created. You can specify the storage path. You can

click **Bucket ACL Info** in the **Create Task** dialog box to check whether a public OBS bucket is selected.

- Creating OBS buckets is free of charge, but saving files will incur certain costs.

Step 9 After settings are complete, click **OK**.

Step 10 In the task list, locate the created task and view the task ID, type, status, and progress.

Step 11 Click **Details** in the **Operation** column to view task details.

Figure 6-116 Task list


Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
4c341463a2146b7b20584c430200140	Database	db_test	2023-07-14 10:42:10	2023-07-14 10:42:11	260.89 KB	SQL	Successful	1 second	10000	100%		Details Download
#9202377804640916942640a775c7	Quick Export	db_test	2023-07-14 10:39:20	2023-07-14 10:39:21	1.61 MB	SQL	Successful	1 second	100000	100%		Details Download

----End

Exporting SQL Results

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

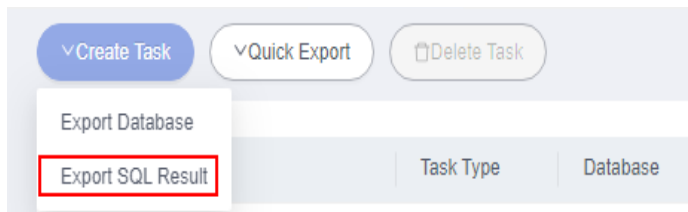
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

Step 7 In the upper left corner of the page, click **Create Task** and choose **Export SQL Result**.

Figure 6-117 Creating a task for exporting SQL results



Step 8 In the displayed dialog box, configure basic information and advanced settings as required.

Figure 6-118 Creating a task for exporting SQL results

Export SQL Result X

Basic Information

Database: Export from standby database ?

Allowed Rows:

File Type:

Charset:

Storage ?: No OBS bucket? [Create Bucket](#)

Creating an OBS bucket is free of charge, but storing files in it will incur fees.

Options: Combine INSERT statements. (Combine INSERT statements into files, with each file smaller than 5 MB.)

Generate one file for each result.

SQL to Execute:

Remarks:

Advanced Settings ∨

- In a SQL result export task, the executed SQL statements cannot exceed 5 MB.
- To export multiple SQL result sets at a time, enter SQL statements in the SQL text box. Enter each SQL statement on a separate line and add a semicolon (;) at the end. After the export task is complete, SQL files are generated. One SQL statement corresponds to one file.
- DAS does not store any user data. The exported data files are stored in the OBS bucket that you have created.
- You can click **Bucket ACL Info** in the **Create Task** dialog box to check whether a public OBS bucket is selected.
- Creating OBS buckets is free of charge, but saving files will incur certain costs.

Step 9 After settings are complete, click **OK**.

Step 10 In the task list, locate the created task and view the task ID, type, status, and progress.

Step 11 Click **Details** in the **Operation** column to view task details.

Figure 6-119 Task list

Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
020227708446000108420400010001	SQL Backup	db_test	2023-07-14 10:4 8:00	2023-07-14 10:4 8:00	200.84 KB	SQL Backup	Successful	1 second	10000	100%		Details Download
020227708446000108420400010002	Database	db_test	2023-07-14 10:4 8:00	2023-07-14 10:4 8:01	200.89 KB	SQL	Successful	1 second	10000	100%		Details Download
020227708446000108420400010003	Quick Export	db_test	2023-07-14 10:3 8:00	2023-07-14 10:3 8:01	1.61 MB	SQL	Successful	1 second	100000	100%		Details Download

----End

Downloading Data Files


Data exported using the data export function is stored in the OBS bucket you created. You can download exported data files in any of the following ways:

- Download on the DAS Console.
- Download on the OBS management console.

Quick Export (Not Promoted)

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

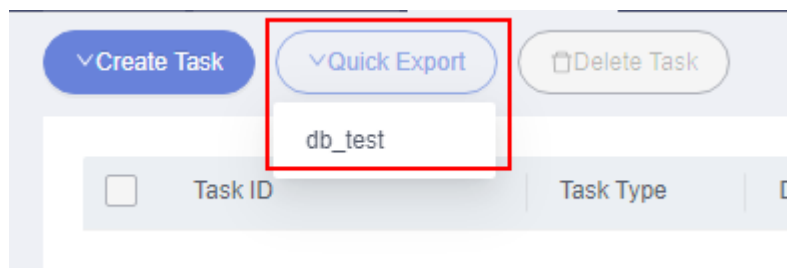
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

Step 7 In the upper left corner of the page, click **Quick Export** and select the database that you want to export data from.

Figure 6-120 Quick export

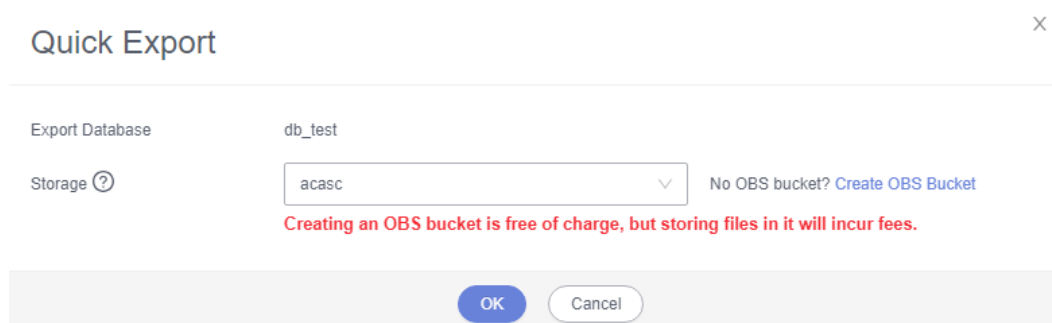


NOTE

A maximum of 200,000 rows can be quickly exported from a single table. To export more data, choose **Create Task > Export Database**.

Step 8 On the **Quick Export** page, select a storage path and click **OK**.

Figure 6-121 Quick export



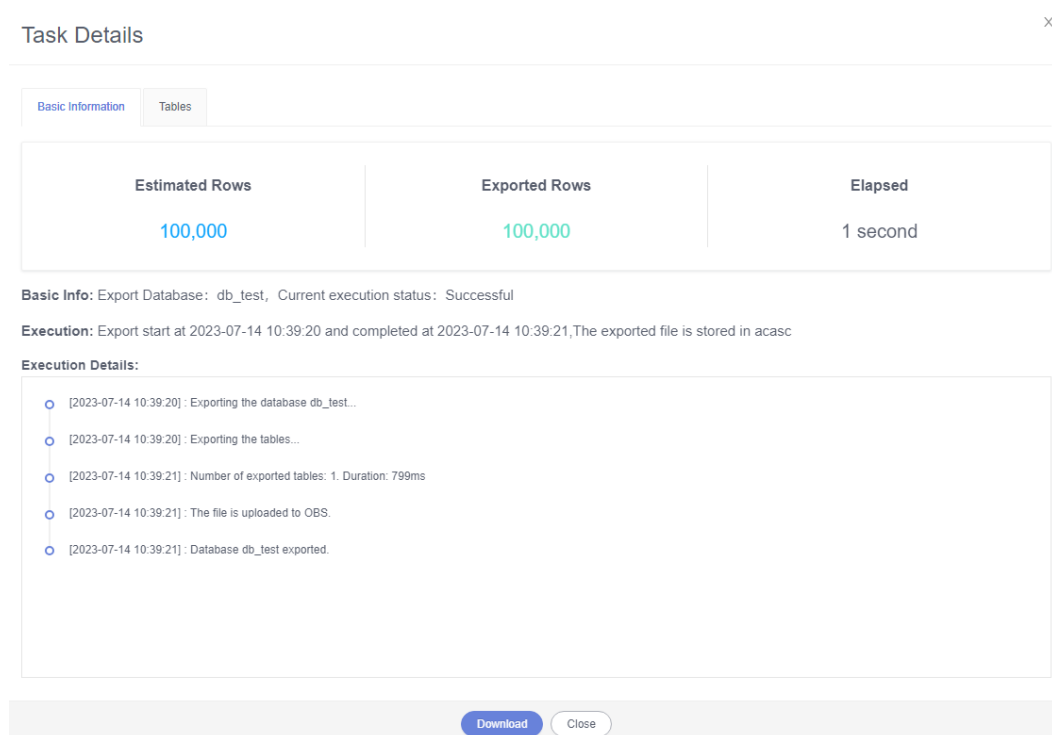
Step 9 In the task list, view the export task you created.

Figure 6-122 Task list

Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
e92237709844699169426 49a175c7	Quick Export	db_test	2023-07-14 10:3 9:20	2023-07-14 10:3 9:21	1.61 MB	SQL	Successful	1 second	100000	100%		Details Download

In the row that contains the export task, you can click **Details** in the **Operation** column to view execution details of the task and information about exported tables.

Figure 6-123 Task details



-----End

6.11 Data Generator (Not Promoted)

During the functional testing of a program, a large amount of test data complying with specific rules needs to be inserted into the database. DAS can help you

generate test data based on specific rules. This section describes how to generate test data on the DAS console.

Procedure



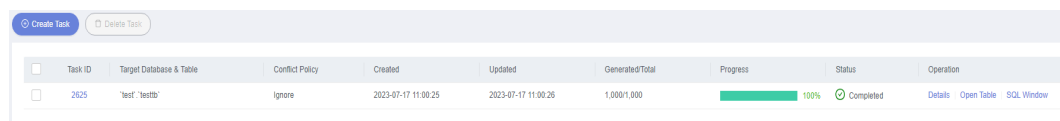
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Data Scheme > Data Generator**.
- Step 7** On the displayed page, click **Create Task**.

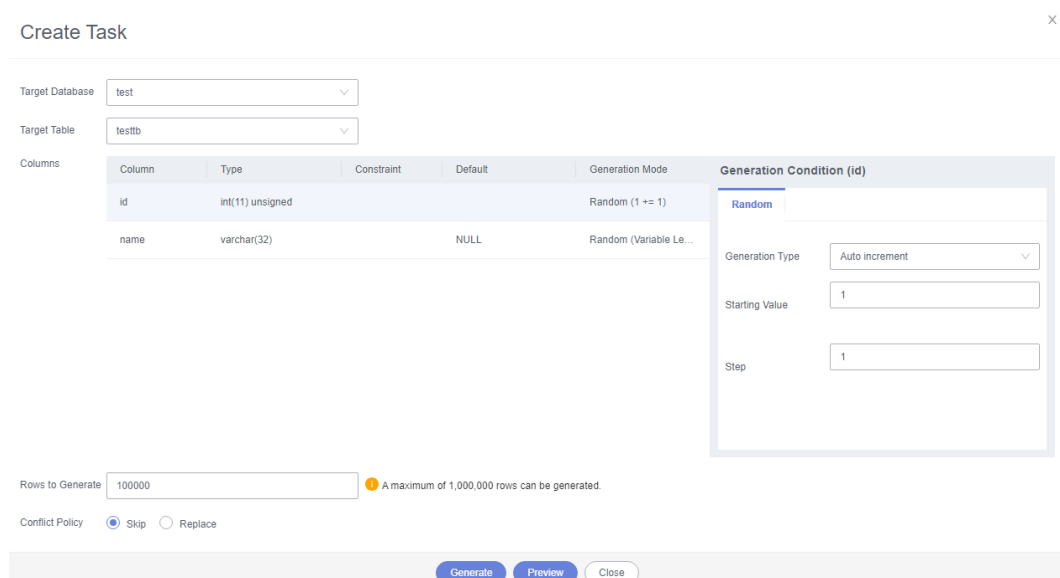
Figure 6-124 Creating a data generation task



Task ID	Target Database & Table	Conflict Policy	Created	Updated	Generated/Total	Progress	Status	Operation
2625	'test': 'testtb'	Ignore	2023-07-17 11:00:25	2023-07-17 11:00:26	1,000/1,000	<div style="width: 100%;"></div> 100%	Completed	Details Open Table SQL Window

- Step 8** In the displayed dialog box, configure required parameters.

Figure 6-125 Configuring task parameters



Create Task

Target Database: test

Target Table: testtb

Column	Type	Constraint	Default	Generation Mode	Generation Condition (id)
id	int(11) unsigned			Random (1 +- 1)	Random
name	varchar(32)		NULL	Random (Variable Le...	Generation Type: Auto increment Starting Value: 1 Step: 1

Rows to Generate: 100000 A maximum of 1,000,000 rows can be generated.

Conflict Policy: Skip Replace

Buttons: Generate, Preview, Close

- **Rows to Generate**
A maximum of 1,000,000 rows of data can be generated.

- **Conflict Policy**
If you select **Skip**, the system skips data rows in conflict and continues generating data. If you select **Replace**, the system replaces existing rows with new ones that have the same primary key.
- **Generation Mode**
You can set the rules for randomly generated data based on the column settings. For example, if the column type is time, you can set the start time, end time, and format, or select **Based on current time**.

Step 9 Click **Preview** to check whether the data that will be generated can meet your requirements. If not, adjust the generation rules.

Figure 6-126 Data preview

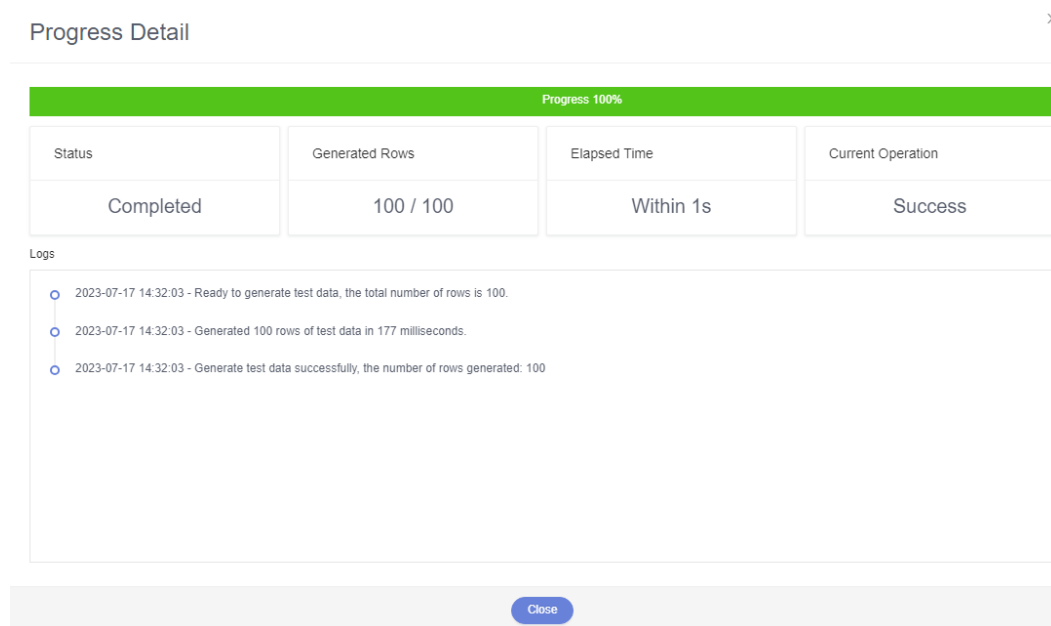
Preview ×

id	name
1	%I00Dt*
2	oZuC(g
3	qB
4	{FW
5	~6%ZUSzBj
6	2ecS}
7	h?bs
8	?jg
9	vPP
10	7d)?

10 / page Total Records: 100 < 1 2 3 4 5 ... 10 >

Close

Click **Generate**.

Figure 6-127 Test data generation progress

Step 10 In the task list, view the information, progress, and status of the current task.

In the task list, locate the created task and click **Details**. You can also delete the task as required.

Figure 6-128 Task list

<input type="checkbox"/>	Task ID	Target Database & Table	Conflict Policy	Created	Updated	Generated/Total	Progress	Status	Operation
<input type="checkbox"/>	2626	'test', 'testtb'	Ignore	2023-07-17 14:32:03	2023-07-17 14:32:03	100/100	100%	Completed	Details Open Table SQL Window
<input type="checkbox"/>	2625	'test', 'testtb'	Ignore	2023-07-17 11:00:25	2023-07-17 11:00:25	1,000/1,000	100%	Completed	Details Open Table SQL Window

----End

6.12 Task Management


6.12.1 Scheduling Tasks (Not Promoted)

DAS allows you to execute SQL statements by scheduling tasks. Scheduling types include **immediate**, **scheduled**, and **periodic**. You can select a scheduling type when creating a task. Error control and transaction control can be performed on SQL statements during scheduling, and task dependency chains can be set for dependent SQL statements.

Creating a Scheduling Task

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Background Tasks > Task Scheduling**.

 **NOTE**

You can create a scheduling task only after agreeing to save SQL statements in a database.

Step 7 On the **Scheduling Tasks** tab, click **Create Task**.

Step 8 On the displayed page, enter a task name and specify a scheduling type and execution time tolerance.

Figure 6-129 Creating a task



Table 6-10 Parameter description

Parameter	Description
Task Name	Task name, which is user-defined.
Type	<p>The options can be Immediate, Scheduled, and Periodic. You can select a scheduling type as required.</p> <ul style="list-style-type: none"> • Immediate: indicates that a scheduled task is executed immediately after being submitted. The task is executed only once. • Scheduled: indicates that a task is executed at a scheduled point in time after being submitted. The task is executed only once. • Periodic: indicates that a task is executed periodically at the specified time after being submitted.
Execution Time Tolerance (s)	<p>Refers to how many seconds the system keep executing this task after the expected execution time comes.</p> <p>The default value is 3600. The value ranges from 1 to 86,400.</p>

Step 9 Under **SQL Statements**, click **Add**. On the displayed page, set parameters as needed and click **Save**.

Figure 6-130 Adding SQL statements

Add SQL Group
X

* Group Name

* Instance

* Database

* SQL Statements

1

Skip Errors(recommended)

Enable Transactions(recommended)

Dependent SQL Group

Allow Concurrent Execution(recommended)

Table 6-11 Parameter description

Parameter	Description
Group Name	Group name, which is user-defined.
Instance	Target instance.
Database	Associated database.
SQL Statements	You can manually input SQL statements or import existing SQL files.
Skip Errors	Configuring this parameter is recommended. After this parameter is configured, the system will skip any errors detected when SQL statements in the SQL group are being executed. If this function is disabled, the system will stop executing SQL statements.

Parameter	Description
Enable Transactions	Configuring this parameter is recommended. After this parameter is configured, SQL statements in the current SQL group will be executed as a transaction, and if a DML error occurs, a rollback will be performed. If this function is disabled, each SQL statement in the group is executed separately.
Dependent SQL Group	The system executes all SQL statements in the dependent SQL group first and then those statements in the current group.
Allow Concurrent Execution	Configuring this parameter is recommended. After this parameter is configured, the system will concurrently execute SQL statements in the current SQL group and other SQL groups, except for dependent SQL groups. CAUTION SQL statements in the current SQL group are executed still in serial mode.

Step 10 Click **Submit** at the bottom of the **Create Task** tab.

----End

Managing Scheduling Tasks

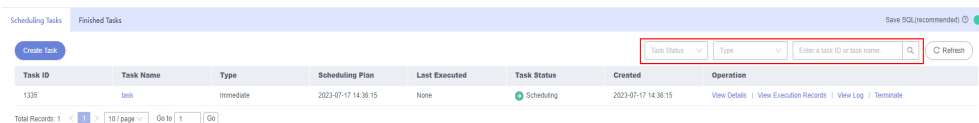
Tasks are displayed on the **Scheduling Tasks** and **Finished Tasks** tab pages by status.

- **Scheduling Tasks:** The scheduling tasks are periodic tasks that are being scheduled or paused.

On the **Task Scheduling** page, click the **Scheduling Tasks** tab.

You can search for tasks by status, scheduling type, task ID, or task name.

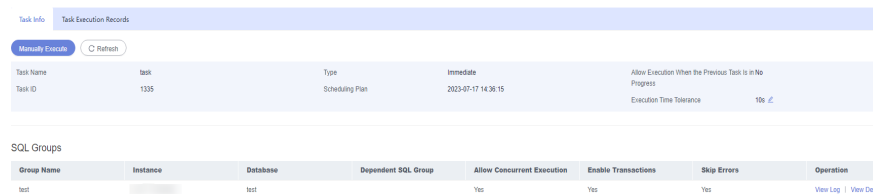
Figure 6-131 Searching for a task



You can also perform the following operations on scheduling tasks:

- **View Details:** Click it to view the task information.

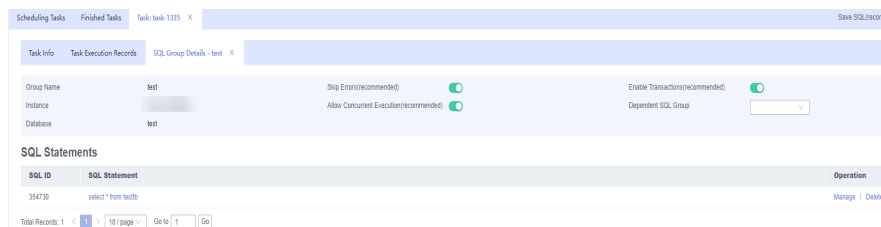
Figure 6-132 Details



Click the name of a scheduling task to go to the **Task Info** page and click **Manually Execute** to trigger a scheduling immediately. After the execution completes, view execution details on the **Scheduling Execution Records** page.

In the **SQL Groups** area, click **View Details**. On the displayed page, view, modify, copy, and delete SQL statements.

Figure 6-133 Managing SQL statements

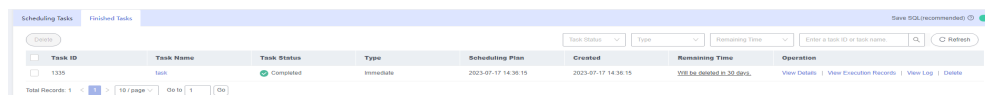


- **Scheduling Execution Records:** Click it to view the task execution details and logs.
- **View Log:** Click it to view log details.
- **Terminate:** Click it to stop a scheduled task. A stopped task will be moved to the **Finished Tasks** list.
- **Pause:** Click it to pause a task. The task status changes from **Scheduling** to **Pause**. You can also click **Resume** to restore the scheduling.
- **Finished Tasks:** Tasks in the **Finished Tasks** list are periodic tasks that have been terminated or immediate and scheduled tasks that have completed.

On the **Task Scheduling** page, click the **Finished Tasks** tab.

You can search for tasks by status, scheduling type, task ID, or task name.

Figure 6-134 Viewing task information



You can also perform the following operations on scheduling tasks:

- **View Details:** Click it to view the task information.
Click the name of a scheduled or immediate task that has completed. On the displayed page, click **Manually Execute**. After the execution completes, view execution details on the **Scheduling Execution Records** page.
In the **SQL Groups** area, click **View Details**. On the displayed page, view, modify, copy, and delete SQL statements.
- **View Execution Records:** Click it to view the task execution details, group execution status, SQL statements, and group logs.
- **View Log:** Click it to view log details.
- **Delete:** Click it to delete a task from the database.

Creating a Task Scheduling Alarm Rule

To monitor the status of DAS tasks, you can create an alarm rule on the Cloud Eye console. After the alarm rule is created, if a metric reaches the specified threshold

or there is an event, Cloud Eye immediately informs you of the exception through SMN.

- Step 1** Log in to the Huawei Cloud console.
- Step 2** Choose **Service List > Cloud Eye**.
- Step 3** In the navigation pane, choose **Alarm Management > Alarm Rules**.
- Step 4** Click **Create Alarm Rule** in the upper right corner.
- Step 5** On the displayed page, set parameters as prompted.
 1. Configure basic information of the alarm rule.

Figure 6-135 Basic information

Table 6-12 Parameters

Parameter	Description
Name	Alarm rule name. The system generates a random name, which you can modify. Example value: alarm-b6al
Description	(Optional) Supplementary information about an alarm rule

2. Select an object to be monitored and set alarm parameters.

Figure 6-136 Alarm parameters

Table 6-13 Alarm parameters

Parameter	Description	Example Value
Alarm Type	Alarm type, which can be Metric or Event	Metric
Event Type	If you select Event for Alarm Type , you need to select an event type, which can be System event or Custom event .	System event
Event Source	If you select Event for Alarm Type , you need to select an event source. <ul style="list-style-type: none">- If you select System event for Event Type, you need to select a cloud service for which the event is generated. Example value: Elastic Cloud Server- If you select Custom event for Event Type, the event source must be the same as the reported field and written in the <i>Service.Item</i> format.	-
Monitoring Scope	If you select Metric for Alarm Type , you need to select a resource scope to which the alarm rule applies. You can select All resources , Resource groups , or Specific resources . NOTE <ul style="list-style-type: none">- If you select All resources, an alarm will be triggered when any resource of the current cloud product meets the alarm policy. To exclude resources that do not need to be monitored, click Select Resources to Exclude.- If you select Resource groups, an alarm will be triggered when any resource in the group meets the alarm policy. To exclude resources that do not need to be monitored, click Select Resources to Exclude.- If you select Specific resources, click Select Specific Resources and select resources.	All resources

Parameter	Description	Example Value
Method	<ul style="list-style-type: none"> - Configure manually: If you select Event for Alarm Type and Custom event for Event Type, Configure manually is selected by default. - Associate template: If an associated template is modified, the alarm policy will be modified as well. <p>NOTE</p> <ul style="list-style-type: none"> ▪ If you select Cloud product for Resource Level, only changes to policies for the specified cloud product in an associated template will be automatically synchronized. ▪ If you select Specific dimension for Resource Level, only changes to policies for the specified dimension in an associated template will be automatically synchronized. 	Configure manually
Alarm Policy	<p>If you select Event for Alarm Type and Custom event for Event Type, you need to set Alarm Policy.</p> <p>If you select Custom event for Event Type, as long as an event occurs (for example, the running status is abnormal), an alarm will be triggered.</p> <p>NOTE</p> <p>A maximum of 50 alarm policies can be added to an alarm rule. If any one of these alarm policies is met, an alarm is triggered.</p>	-

3. Set alarm notification parameters as prompted.

Figure 6-137 Alarm notification parameters

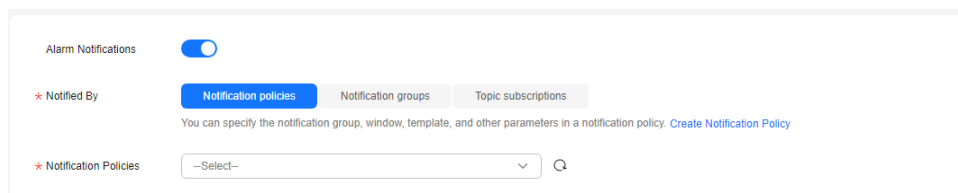


Table 6-14 Alarm notification parameters

Parameter	Description
Alarm Notifications	Whether to send notifications to users via SMS, email, voice notification, HTTP, HTTPS, FunctionGraph (function), FunctionGraph (workflow), WeCom chatbot, DingTalk chatbot, Lark chatbot, and WeLink chatbot.

Parameter	Description
Notified By	You can select Notification groups or Topic subscriptions . <ul style="list-style-type: none"> – Notification groups: Configure notification templates on Cloud Eye. – Topic subscriptions: Configure notification templates on SMN.
Notification Policies	If Notification policies is selected for Notified By , you need to select one or more notification policies. You can specify the notification group, window, template, and other parameters in a notification policy.

4. In the **Advanced Settings** area, configure an enterprise project and a tag.

Figure 6-138 Advanced Settings

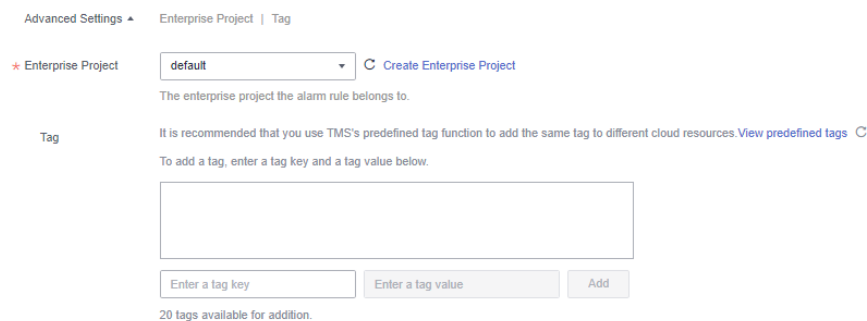


Table 6-15 Parameters

Parameter	Description
Enterprise Project	Enterprise project that an alarm rule belongs to. Only users with the enterprise project permissions can view and manage the alarm rule. For details about how to create an enterprise project, see Creating an Enterprise Project .
Tag	<p>A tag is a key-value pair. Tags identify cloud resources so that you can easily categorize and search for your resources. You are advised to create predefined tags on TMS. For details, see Creating Predefined Tags.</p> <p>If your organization has configured tag policies for Cloud Eye, you need to add tags to alarm rules based on tag policies. If a tag does not comply with the policies, an alarm rule may fail to be created. Contact your organization administrator to learn more about tag policies.</p> <ul style="list-style-type: none"> – A key can contain a maximum of 128 characters, and a value can contain a maximum of 225 characters. – A maximum of 20 tags can be created.

5. Click **Create**.

After the alarm rule is created, if a metric reaches the specified threshold, Cloud Eye will immediately inform you of an error.

----End

For more information, see [Creating an Alarm Rule](#).

6.12.2 Scheduled Backup (Not Promoted)


Scheduled backup allows you to periodically back up important database tables and data or SQL result sets so that data can be restored timely in case of data loss.

Configuring the AK/SK

Configure AK and SK before you periodically back up database tables or SQL result sets.

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

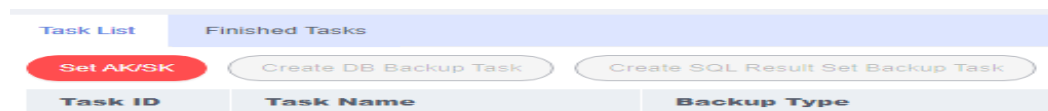
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Background Tasks > Scheduled Backup**.

Step 7 On the **Task List** tab, click **Set AK/SK** in the upper left corner.

Figure 6-139 Configuring the AK/SK



Step 8 In the displayed dialog box, specify **Storage**, enter an AK and SK, and click **Test AK/SK**. After the test succeeds, click **OK**.

Figure 6-140 Configuring AK/SK information

Set AK/SK

×

Set AK/SK: With the AK/SK pair ([learn more about access keys](#)) preset in an OBS bucket, you can upload or download files to or from an OBS bucket. You are advised to set an AK/SK pair for secure operations because DAS encrypts access keys before storing them.

* Storage

No OBS bucket? [Create OBS Bucket](#)

* AK

[Obtain AK/SK](#)

* SK

[Test AK/SK](#)

OK
Cancel

Table 6-16 Parameter description

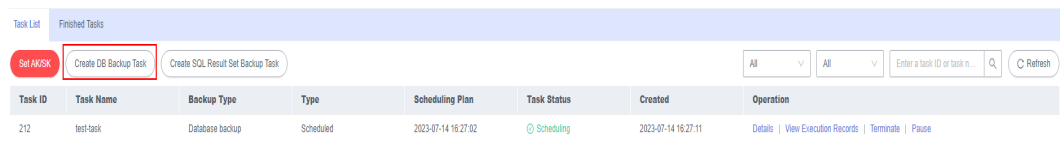
Parameter	Description
Storage	The system stores encrypted files in OBS buckets.
AK and SK	AK and SK : Access key ID (AK) and secret access key (SK) are required credentials for you to access Huawei cloud services using development tools like APIs, CLI, and SDKs. The system uses AKs to identify users and SKs to verify encrypted signatures, ensuring that requests are secret, complete, and correct.

----End

Creating a DB Backup Task

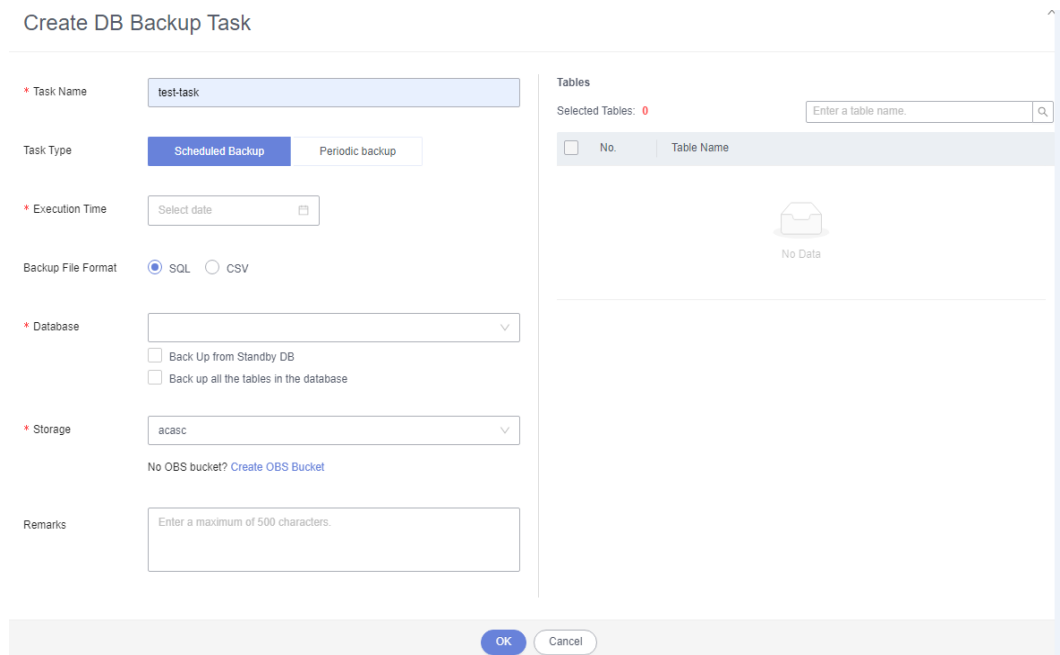
Step 1 On the **Task List** page, click **Create DB Backup Task**.

Figure 6-141 Creating a DB backup task



Step 2 Enter a task name, select a task type, backup file format, database, and storage path, and enter remarks.

Figure 6-142 Page for creating a database backup task

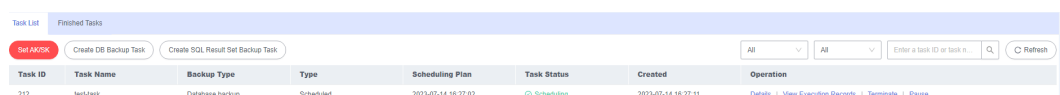


Step 3 Confirm the settings and click **OK**.

Step 4 View that the status of the current backup task is **Scheduling** in the task list.

You can also view task details and execution records and terminate or pause the task.

Figure 6-143 Viewing backup tasks



- You can click **Details** to view backup logs.
- You can click **View Execution Records** to view the backup status.
- You can click **Terminate** to end the backup task.
- You can click **Pause** suspend the backup task.

You can also click **Download** to download backup data.

Figure 6-144 Downloading backup data

Task ID	Backup Type	Database	Started	End Time	Backup Status	Operation
c74d51fe05314c47b828bd182e9d06727	Database backup	db_test	2023-07-14 16:31:30	2023-07-14 16:31:33	Successful	Details Download

----End

Creating a SQL Result Set Backup Task

- Step 1** On the task list tab, click **Create SQL Result Set Backup Task**.
- Step 2** Enter a task name, select a task type, backup file format, database, and storage path, and enter SQL statements to be executed and remarks.

Figure 6-145 Creating a SQL result set backup task

Create SQL Result Set Backup Task ✕

*** Task Name**

Task Type Scheduled Backup Periodic backup

*** Execution Time** 📅

Backup File Format SQL_Insert CSV

*** Database** ▼

Back Up from Standby DB

*** Storage** ▼

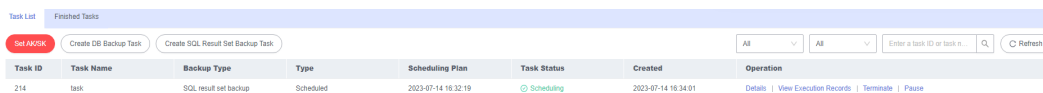
No OBS bucket? [Create OBS Bucket](#)

*** SQL to Execute**

Remarks

OK
Cancel

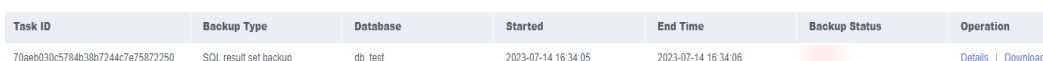
- Step 3** Confirm the settings and click **OK**.
- Step 4** View that the status of the current backup task is **Scheduling** in the task list.
You can also view details and execution records and terminate or suspend a scheduling task.

Figure 6-146 Viewing backup tasks

Task ID	Task Name	Backup Type	Type	Scheduling Plan	Task Status	Created	Operation
214	task	SQL result set backup	Scheduled	2023-07-14 16:32:19	Scheduling	2023-07-14 16:34:01	Details View Execution Records Terminate Pause

- You can click **Details** to view backup logs.
- You can click **View Execution Records** to view the backup status.
- You can click **Terminate** to end the backup task.
- You can click **Pause** suspend the backup task.

You can also click **Download** to download backup data.

Figure 6-147 Downloading backup data

Task ID	Backup Type	Database	Started	End Time	Backup Status	Operation
70aeb030c5784b38b7244c7e75872250	SQL result set backup	db_test	2023-07-14 16:34:05	2023-07-14 16:34:06		Details Download

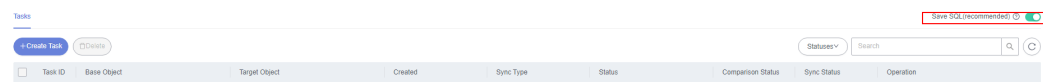
----End

6.13 Table Structure Comparison and Synchronization (Not Promoted)

This section describes how to check the structure difference by comparing and synchronizing table structures when you perform a migration or verification.



Usage Notes

To create a table structure comparison and synchronization task, you need to toggle on **Save SQL** first so that DAS can store your data. If you do not toggle on it, you cannot create table structure comparison and synchronization tasks.



Task ID	Base Object	Target Object	Created	Sync Type	Status	Comparison Status	Sync Status	Operation
---------	-------------	---------------	---------	-----------	--------	-------------------	-------------	-----------

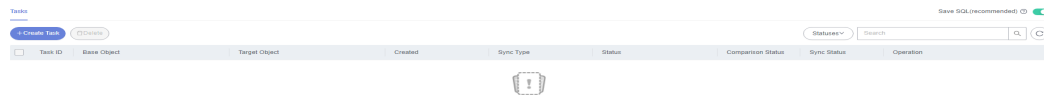
Procedure

- Step 1** Log in to the [Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Structure Management > Table Structure Comparison and Synchronization**.

Search for tasks by status and view task details.

Step 7 On the displayed page, click **Create Task** in the upper left corner.

Figure 6-148 Creating a table structure comparison and synchronization task



Step 8 On the displayed page, configure required parameters and click **Next**.

Source Instance: []

Source Database: [test]

Target Instance: [Current instance | Another instance]

Target Database: []

Error Tolerance: Skip comparison error Skip sync error

Sync Type: [Global | Specified | One-to-one | One-to-more] ⓘ

Global: synchronizes all the databases with duplicate names to the target database.

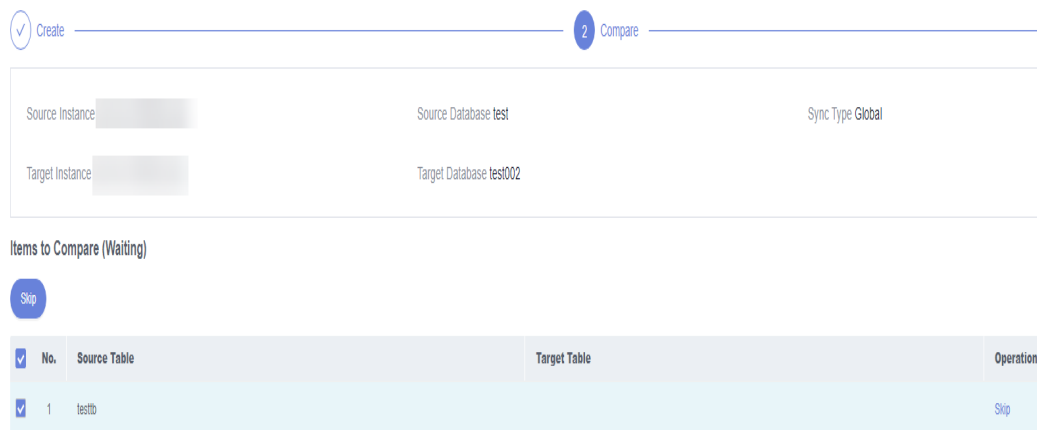
Table 6-17 Parameter description

Parameter	Description
Source Instance	The DB instance that you have logged in to by default.
Source Database	Select a source database.
Target Instance	Select Current instance or Another instance .
Target Database	Select a target database to be compared with.
Error Tolerance	Configuring this parameter is recommended. After this parameter is configured, if a comparison or synchronization error occurs during task execution, the system ignores the error and continues the execution.
Sync Type	<ul style="list-style-type: none"> ● Global: synchronizes all tables with the same name from the source database to the target one. ● Specified: synchronizes specific tables with the same name from the source database to the target one. ● One-to-one: allows you to specify a source table and target table for synchronization. The two tables can have different names. ● One-to-more: synchronizes the structure of a table in the source database to multiple tables in the target database. This option is usually selected when you want to change table structures during database and table sharding.

Step 9 Click **Next** to go to the **Compare** page, check task information and comparison items, and click **Compare**.

You can also select the items you want to skip and click **Skip** to cancel the comparison.

Figure 6-149 Setting comparison items



Step 10 View comparison progress.

In the comparison item list, click **View Logs** in the **Operation** column to obtain comparison details. You can also click **Download DDL** as needed.

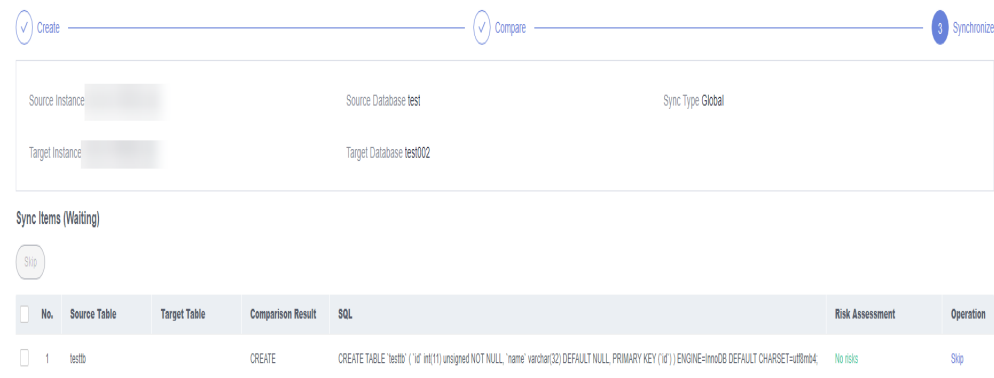
Figure 6-150 Viewing comparison progress



Step 11 After comparison is complete, click **Next**. On the **Synchronize** page, view basic information about this comparison task, such as the source instance, source database, target instance, target database, and synchronization type, and in the synchronization item list, specify the items to be synchronized.

Skip synchronization items that may cause high risks and then click **Synchronize**.

Figure 6-151 Synchronizing data



Step 12 After synchronization is complete, click **View Logs** in the **Operation** column to obtain comparison details.

You can download DDL as required.

----End

6.14 Intelligent O&M

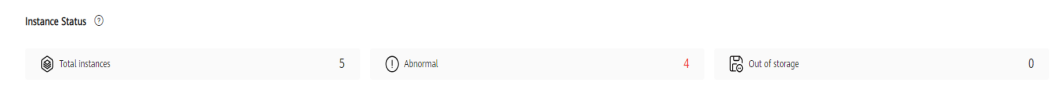
6.14.1 Dashboard

Dashboard helps you get knowledge of overall information about your instances, including instances by status, engine distribution, active alarms, slow query logs, monitoring dashboard, and resource risky instances. Intelligent Diagnosis checks instance health using instance operation data and intelligent algorithms and provides diagnosis results and suggestions.

Viewing the Instance Status

You can view the number of instances by status in the current region, including primary instances and read replicas.

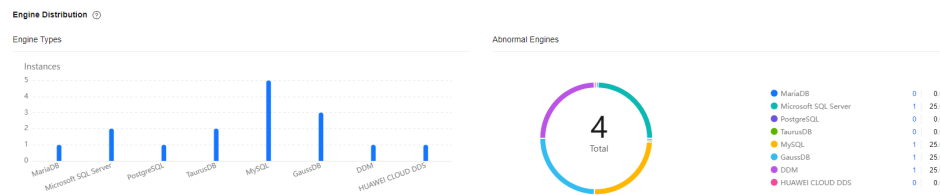
Figure 6-152 Instance status



Viewing Engine Distribution

You can view the distribution of engines in the current region, including engine types and abnormal engines.

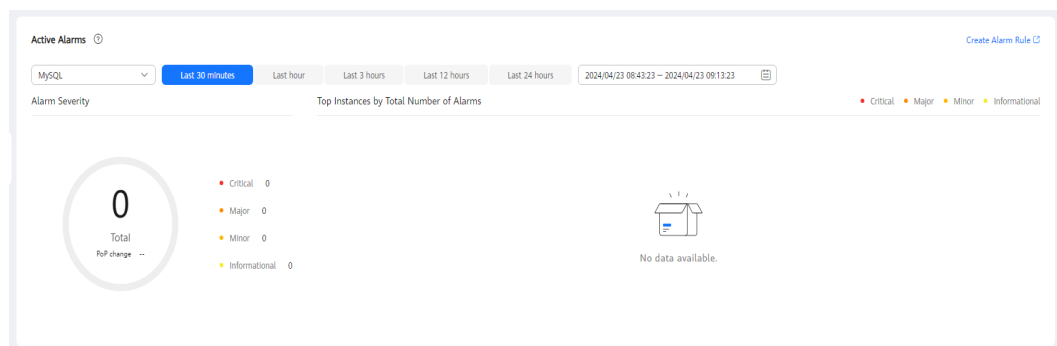
Figure 6-153 Engine distribution



Querying Active Alarms

You can view active alarms of all instances in the current region, including alarms in the Alarm (metric) and Triggered (event) statuses.

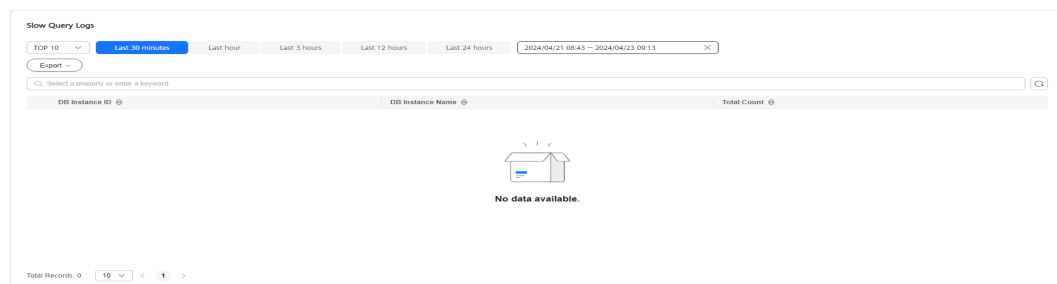
Figure 6-154 Active alarms



Viewing Slow Query Logs

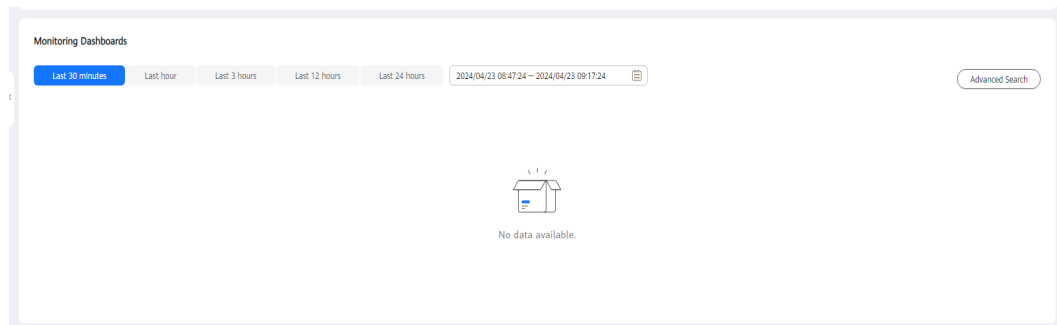
You can view the number of slow query logs of all instances in the current region.

Figure 6-155 Slow query logs



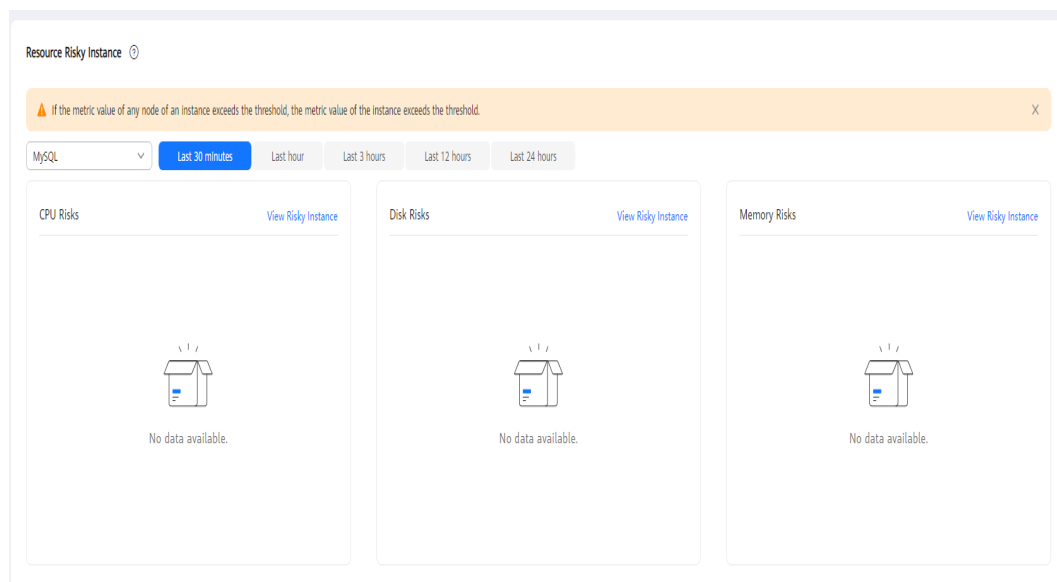
Monitoring Dashboards

You can view metrics of all instances in the current region.

Figure 6-156 Monitoring dashboards

Viewing Resource Risky Instances

You can view metric risks of all instances in the current region.

Figure 6-157 Resource risky instances

6.14.2 Setting an Instance as Paid

Intelligent O&M is available for paid and free instances. Paid instances can enjoy more value-added functions.

For details about instance billing policies, see [Intelligent O&M Billing](#).

If you want to set an instance as paid, go to [Setting an Instance as Paid](#).

If you want to set more than one instance as paid, go to [Setting Instances as Paid](#).

If you want to set your instances as free instances, see [Setting a Paid Instance as Free](#).

Setting an Instance as Paid



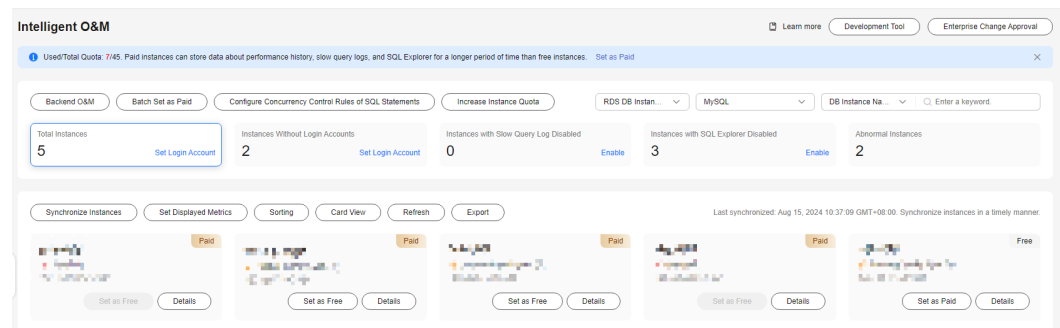
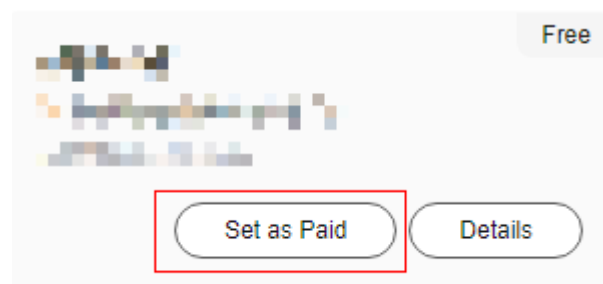
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M** > **Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 6-158 Searching for instances



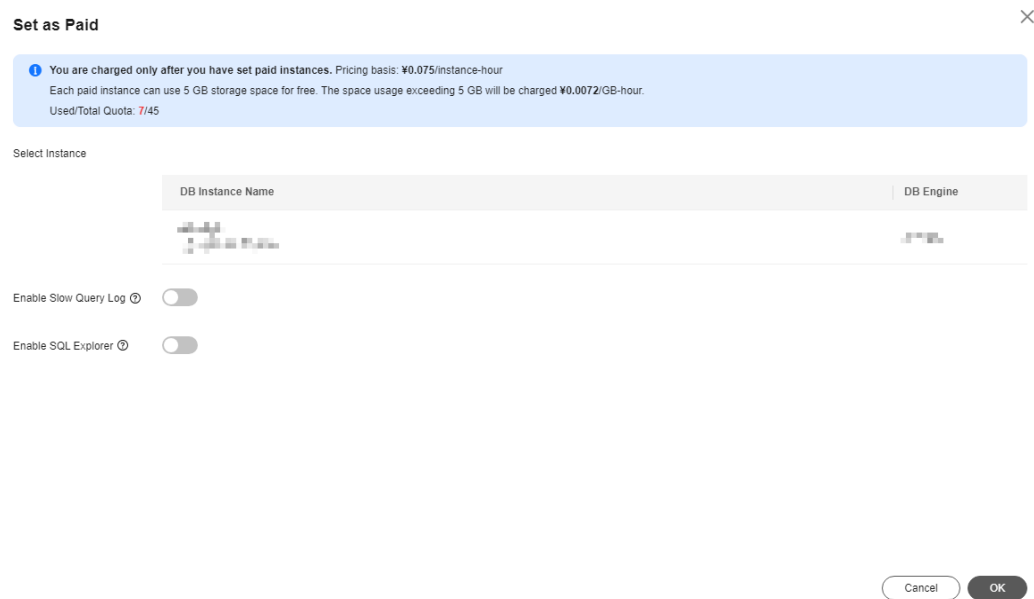
- Step 6** Select the instance that you want to set as paid and click **Set as Paid**.

Figure 6-159 Setting an instance as paid



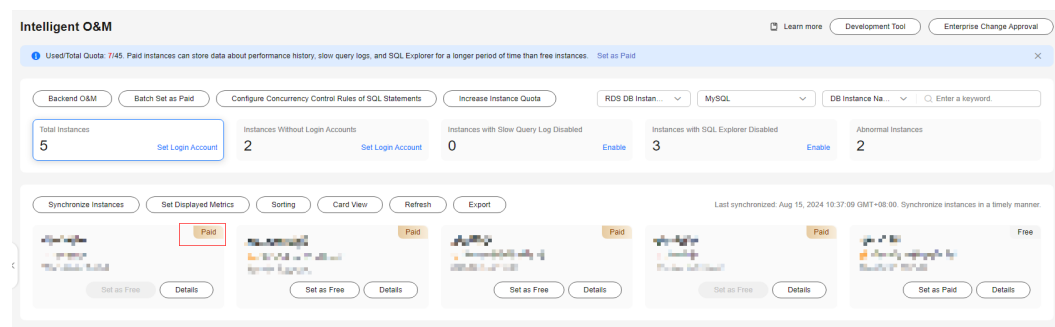
- Step 7** Carefully read the information displayed in the dialog box and click **OK**.

Figure 6-160 Setting an instance as paid



Step 8 On the **Instance List** page, check whether the instance status changes to **Paid**.

Figure 6-161 Instance list




----End

Setting Instances as Paid

Step 1 [Log in to the Huawei Cloud console](#).

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

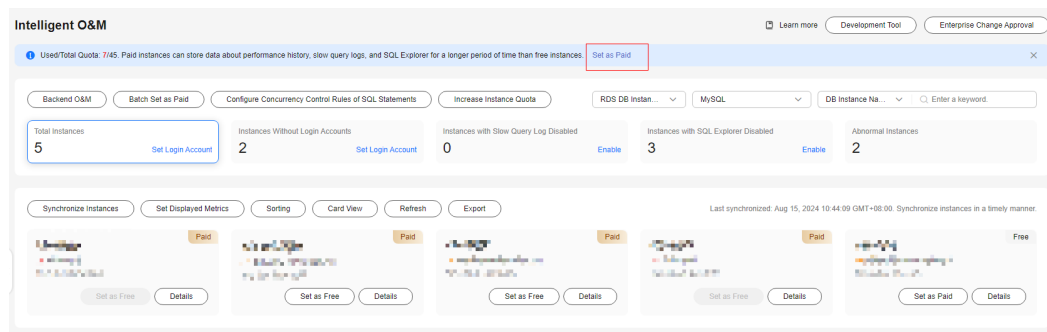
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

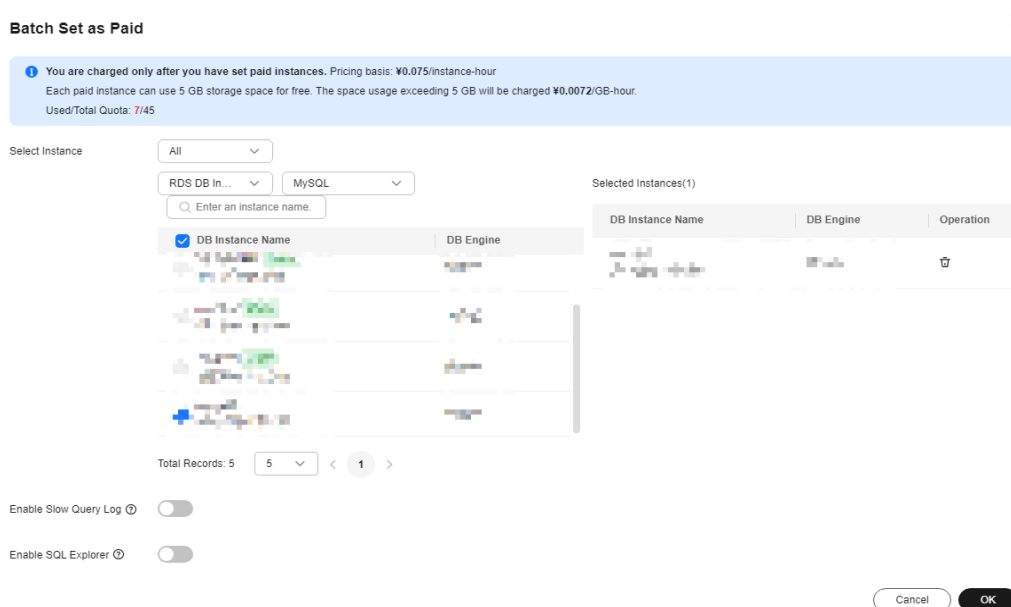
Step 5 On the displayed page, click **Batch Set as Paid** or **Set as Paid**.

Figure 6-162 Setting instances as paid



Step 6 Carefully read the information displayed in the dialog box, select the instances that you want to set as paid, and click **OK**.

Figure 6-163 Setting instances as paid





Step 7 On the **Instance List** page, check whether the instance status changes to **Paid**.

----End

Setting a Paid Instance as Free

Step 1 [Log in to the Huawei Cloud console](#).

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

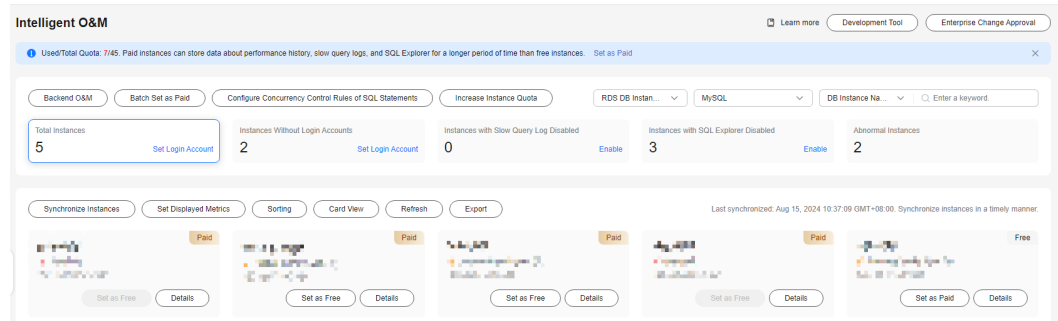
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

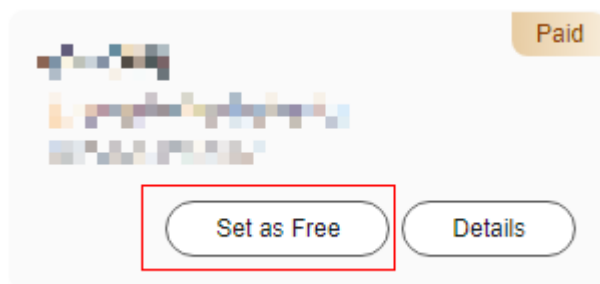
Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 6-164 Searching for instances



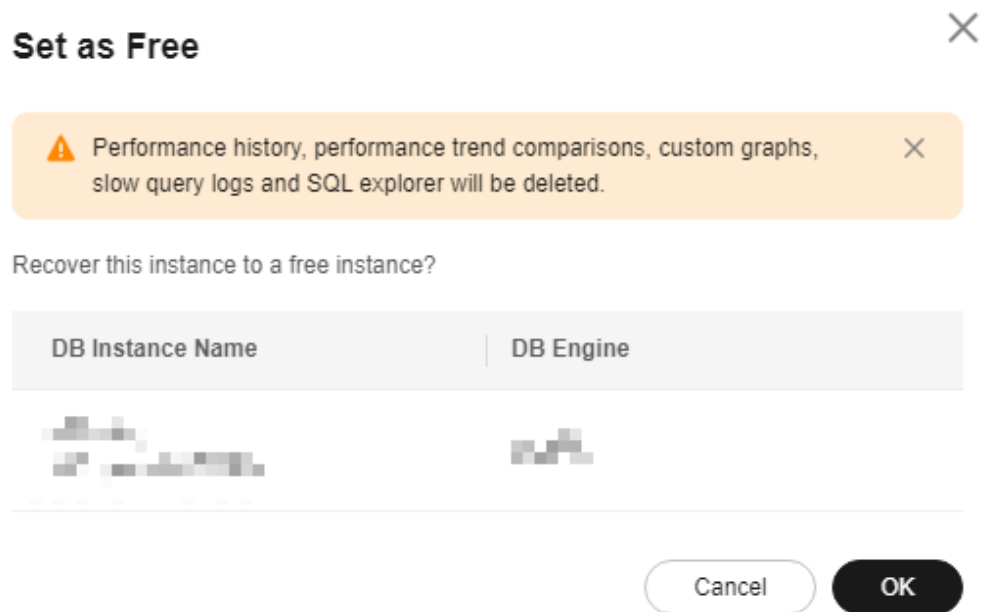
Step 6 Locate the instance that you want to set as free and click **Set as Free** on the **Instance Overview** page.

Figure 6-165 Setting an instance as free



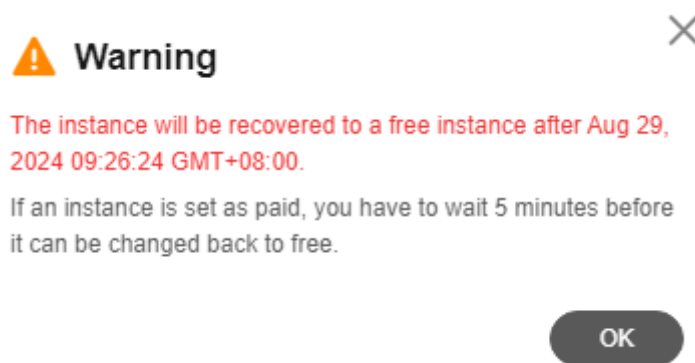
Step 7 Carefully read the information displayed in the dialog box and click **OK**.

Figure 6-166 Setting an instance as free



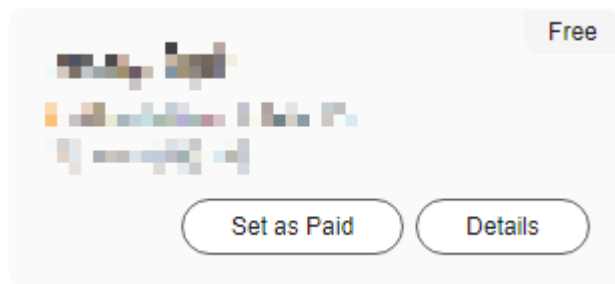
- If an instance is set as paid, you have to wait 5 minutes before it can be changed back to free.

Figure 6-167 Setting an instance as paid



- On the **Instance List** page, check whether the instance status changes to **Free**.

Figure 6-168 Instance list



----End

6.14.3 Viewing the Overall Status of an Instance

Dashboard shows the status of your instance, including alarms, resource usages, and key performance metrics. DAS diagnoses instance health using operational data analytics and intelligent algorithms, and provides you with solutions and suggestions for handling detected exceptions.



Function Modules

Table 6-18 lists the function modules of the **Overview** page.

Table 6-18 Function description

Function	Description
Alarms	Shows alarms of different severities during instance running. After you click an alarm severity, the Alarm Rules page is displayed, showing all alarm rules of the severity.
Health	Diagnoses instance health using operational data analytics and intelligent algorithms.
Resources	Shows the CPU usage, memory usage, space usage, and disk IOPS of an instance.
Key Performance Metrics	Displays vCPU utilization & slow query logs, connections, memory utilization, and disk reads/writes in the last hour.

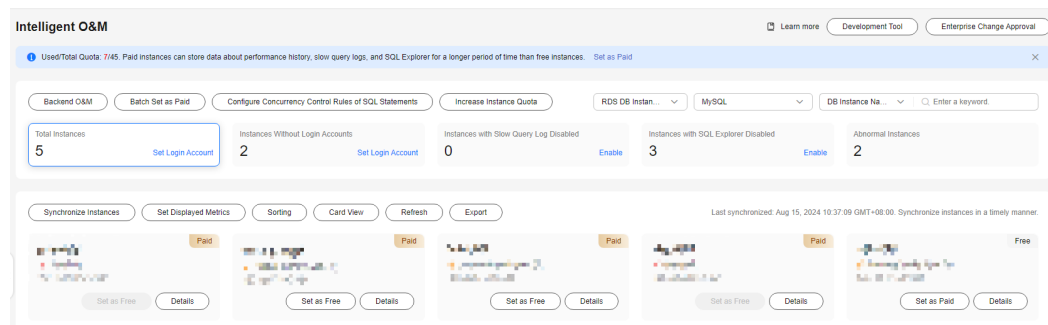
Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 6-169 Searching for instances



Step 6 Locate the box containing your target instance and click **Details**.

Step 7 On the **Dashboard** page, view status of the instance.

- Alarms

In the **Alarms** area, view alarm information of the current instance. To view alarm details, click the number next to an alarm severity.

Figure 6-170 Viewing alarm information

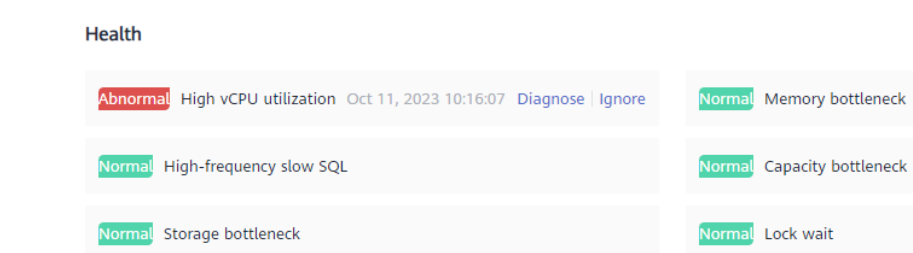


To view metrics such as CPU usage, disk usage, and connection usage, click **Alarm Rules** to configure metrics and alarm policies.

- Health

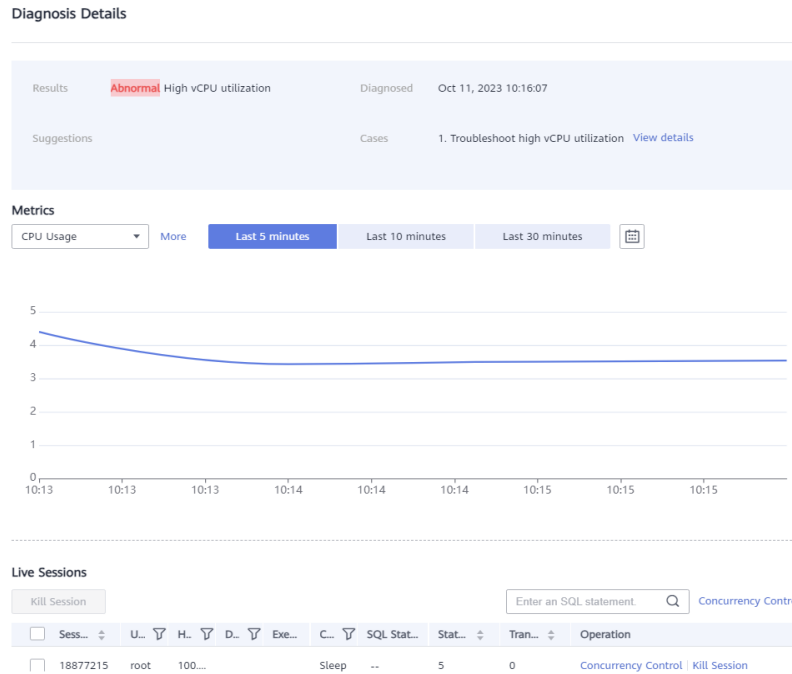
In the **Health** area, view diagnosis results of the instance.

Figure 6-171 Health



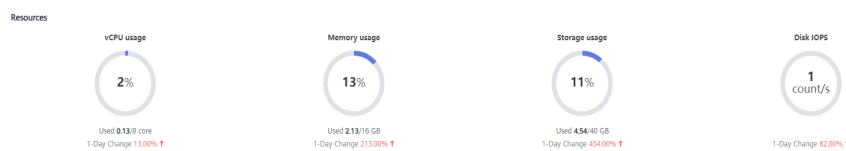
For example, if the vCPU utilization is high, click **Diagnose** to view related performance metrics and optimize service-related SQL statements or upgrade CPU specifications as suggested.

Figure 6-172 Viewing diagnosis details



- **Resources**
In the **Resources** area, view the resource usage of the current instance.

Figure 6-173 Viewing resource usage



- **Key performance metrics**
In the **Key Performance Metrics** area, view key performance metrics in the last hour.

Figure 6-174 Viewing key performance metrics



----End

6.14.4 Real-Time Performance

The **Real-Time Performance** tab displays key metrics of your instance and allows you to compare performance of your instance by date, helping you keep track of changes of your periodic services and metrics and detect exceptions.

Procedure



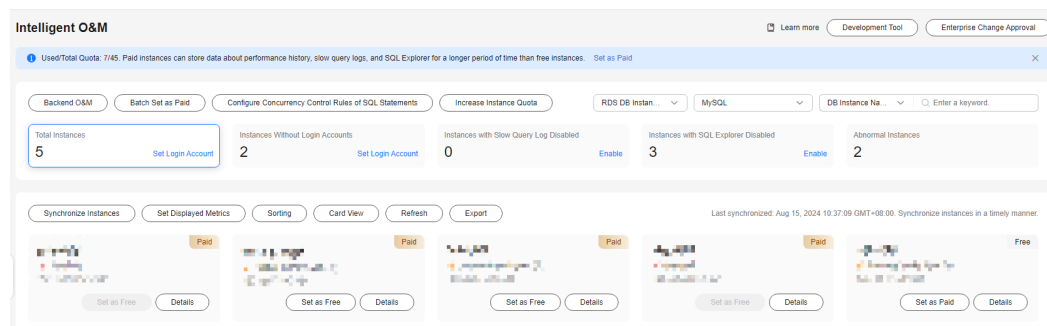
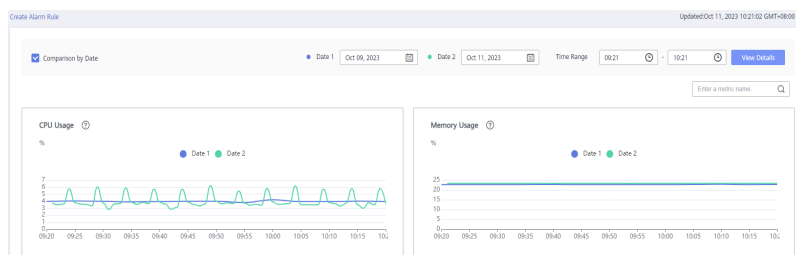
- Step 1** Log in to the Huawei Cloud console.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M** > **Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 6-175 Searching for instances

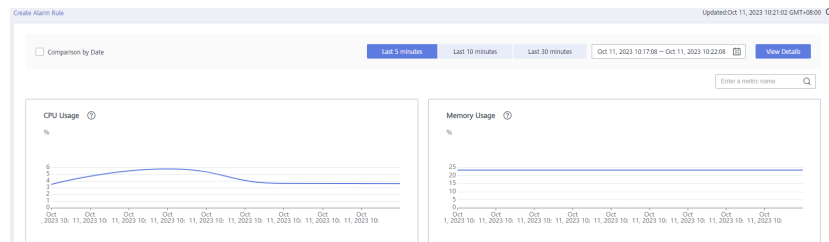


- Step 6** Locate the box containing your target instance and click **Details**.
- Step 7** On the **Performance** tab page, view performance metrics of the current instance.
 - View the trends in metrics in the same time range on different days.
Select **Compare by Date**, set the comparison dates and a time range and click **View Details** to view trends in the instance metrics in the same time range on different days.
You can move the cursor to a point in time of the chart to view the metric at the time point on different days.

Figure 6-176 Performance comparison



- View real-time performance metrics of the instance.
You can deselect **Compare by Date**, set a time range or select **Last 5 minutes**, **Last 10 minutes**, or **Last 30 minutes**, and click **View Details** to view real-time performance metrics of the instance.
You can place the pointer over a time point in the trend chart to view the metric at this time point.

Figure 6-177 Viewing performance metrics

----End

6.14.5 SQL

6.14.5.1 Slow Query Logs

This section describes how to analyze slow query logs in a specified period. Slow Query Log displays a chart of SQL statements that are taking too long to execute and allows you to sort slow SQL statements by multiple dimensions, such as by user, host, or SQL template. It helps you quickly identify bottlenecks and improve instance performance.

Usage Notes

- Enabling **Collect Slow Query Logs** is a must for slow query logs analysis. After it is enabled, DAS stores the slow query logs for analysis.
- Slow query logs of free instances are retained for only one hour. For paid instances and free instances that you have subscribed to **Intelligent O&M** for, their slow query logs are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.
- You can enable the slow query logs function for a maximum of 10 free instances. There is no such a limit on paid instances and free instances that you have subscribed to **Intelligent O&M** for
- For free instances, you can only view slow query logs generated in the latest hour.

Viewing Slow Query Logs

Step 1 [Log in to the Huawei Cloud console.](#)

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


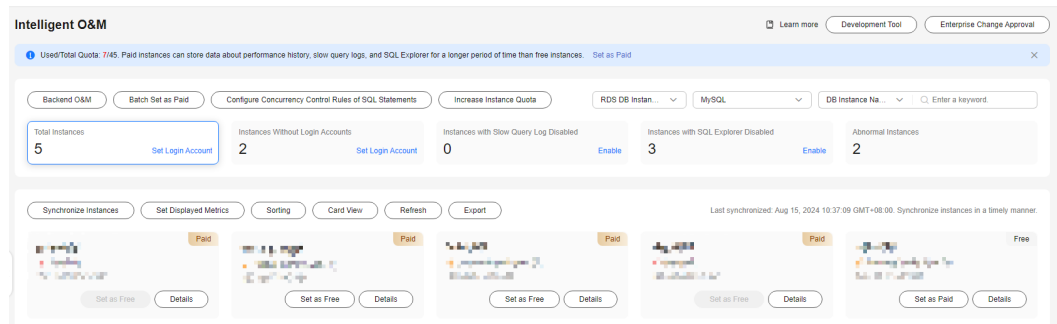
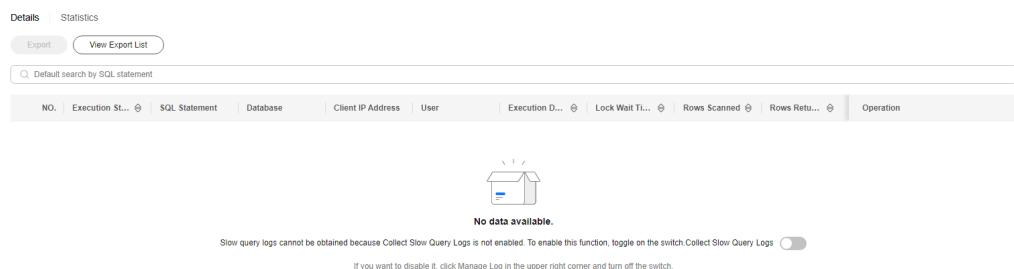
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 6-178 Searching for instances

- Step 6** Locate the target instance and click **Details**.

- Step 7** Choose **SQL > Slow Query Logs**.

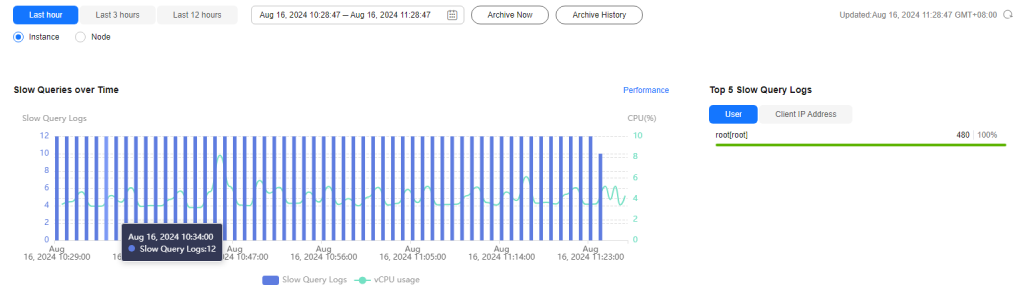
If **Collect Slow Query Logs** is not enabled, enable it as prompted in the **Details** area.

Figure 6-179 Enabling slow query logs collection

You can also click **Log Settings** in the upper right corner of the page to enable **Collect Slow Query Logs**.

- Step 8** On the **Slow Query Logs** tab page, perform the following operations:
- View slow queries over a specified period of time.
Select a time range (last hour, last 3 hours, last 12 hours, or a user-defined time range which must be within one day) to view slow queries in the time range.

Figure 6-180 Slow queries over time



In the chart, you can hover your mouse at any point in time to view slow query logs or CPU usage.

Above the chart, you can switch to another instance or node to view slow queries by instance or by node.

- View slow query log details.
View slow query log details in the lower part of the **Slow Query Logs** area. The details include the SQL statement, execution start time, database, client, user, execution duration, lock wait duration, and scanned and returned rows.

Figure 6-181 Viewing slow query log details

NO.	Execution St...	SQL Statement	Database	Client IP Address	User	Execution D...	Lock Wait T...	Rows Scanned	Rows Retu...	Operation
1	Aug 16, 2024 14...	select sleep.	cch_test	...	root[root]	2,000.272	0	0	1	Concurrency Control Diagnose
2	Aug 16, 2024 14...	select sleep.	cch_test	...	root[root]	2,000.264	0	0	1	Concurrency Control Diagnose
3	Aug 16, 2024 14...	select sleep.	cch_test	...	root[root]	2,000.287	0	0	1	Concurrency Control Diagnose


Click  in the upper right corner of the **Details** area to export slow query log details to a specific OBS bucket. A maximum of 100,000 records can be exported.

Figure 6-182 Exporting slow query log details



After the details are exported, you can click **Export History** to view export records. You can also download the details to your local PC.

Figure 6-183 Viewing export history

Log Export History

Created	Status	Operation
Feb 29, 2024 19:27:29	Exported	Download Delete
Feb 29, 2024 19:00:54	Exported	Download Delete
Feb 29, 2024 14:25:00	Exported	Download Delete
Feb 29, 2024 14:10:18	Exported	Download Delete
Feb 05, 2024 10:15:57	Exported	Download Delete
Feb 04, 2024 11:27:38	Exported	Download Delete
Feb 04, 2024 09:54:01	Exported	Download Delete
Jan 18, 2024 17:54:15	Exported	Download Delete
Jan 18, 2024 17:53:57	Exported	Download Delete

10 Total Records: 22 < 1 2 3 >

OK

NOTE

Slow query log details of free instances cannot be exported. To use this function, set free instances as paid instances or subscribe to **Intelligent O&M**.

Click **Concurrency Control** in the **Operation** column to create a concurrency control rule for the current SQL statement. For details, see [SQL Statement Concurrency Control](#).

- View slow query log statistics.

Figure 6-184 Slow query log statistics


Details | Statistics

Export View Export List

Default search by database

NO.	ID	SQL Templ...	Database	Executi...	Avg. Ex...	Max. E...	Avg. Lo...	Max. L...	Avg. R...	Max. R...	Avg. R...	Max. ...	Operation
1	10788057...	SELE...	ctb_test	662	2,000	2,000	0	0	0	0	0	1	View Sample Diagnose

In the template statistics list, click **View Sample** in the **Operation** column to view the sample of a SQL statement template.

Click  in the upper right corner of the **Statistics** area to export the SQL template to a specific OBS bucket. A maximum of 100,000 records can be exported.

After the template is exported, you can click **View Export List** to view export records. You can also download the details to your local PC.

 **NOTE**

Slow query log details of free instances cannot be exported. To use this function, set free instances as paid instances or subscribe to **Intelligent O&M**.

----End

Slow Query Log Storage and Archiving

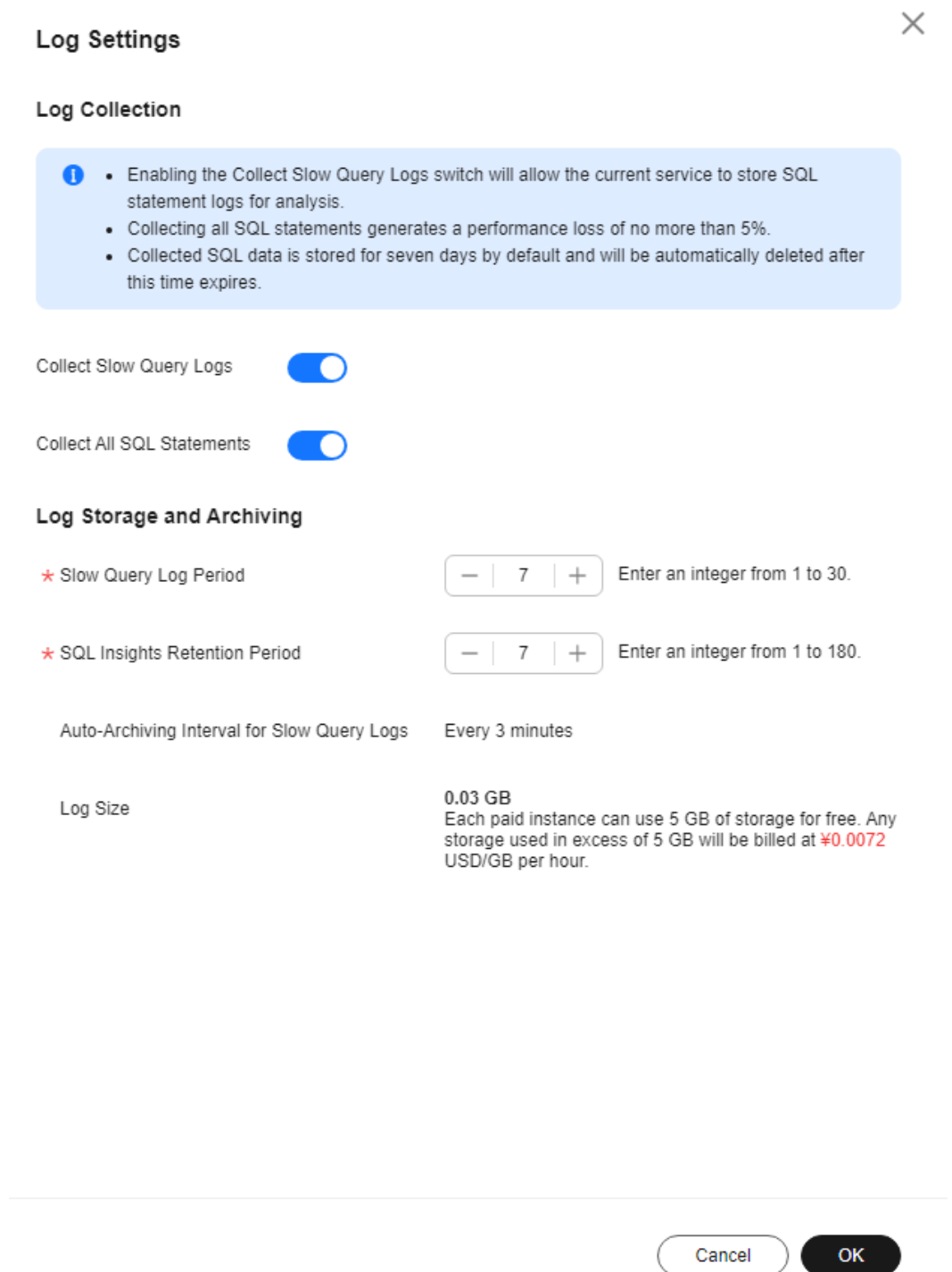
- Slow query log storage

Enabling **Collect Slow Query Logs** will allow DAS to store slow query logs for analysis.

Slow query logs of free instances are retained for only one hour. For paid instances and free instances that you have subscribed to **Intelligent O&M** for, their slow query logs are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.

For paid instances and free instances that you have subscribed to **Intelligent O&M** for, you can click **Log Settings** in the upper right corner of the **SQL** page to set slow query log retention days.

Figure 6-185 Setting storage duration for slow query logs

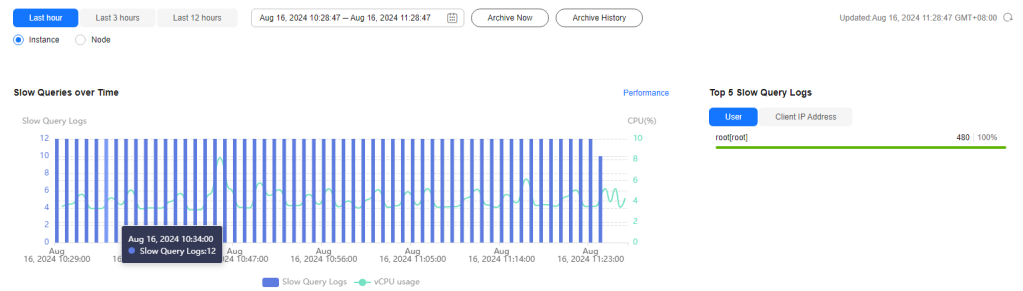


Each paid instance and free instance that you have subscribed to **Intelligent O&M** for can use 5 GB of storage for slow query logs for free. Any storage used in excess of 5 GB will be billed on a pay-per-use basis.

- Log archiving

Slow query logs are automatically archived every 3 minutes. Alternatively, you can click **Archive Now** and then view the latest statistics.

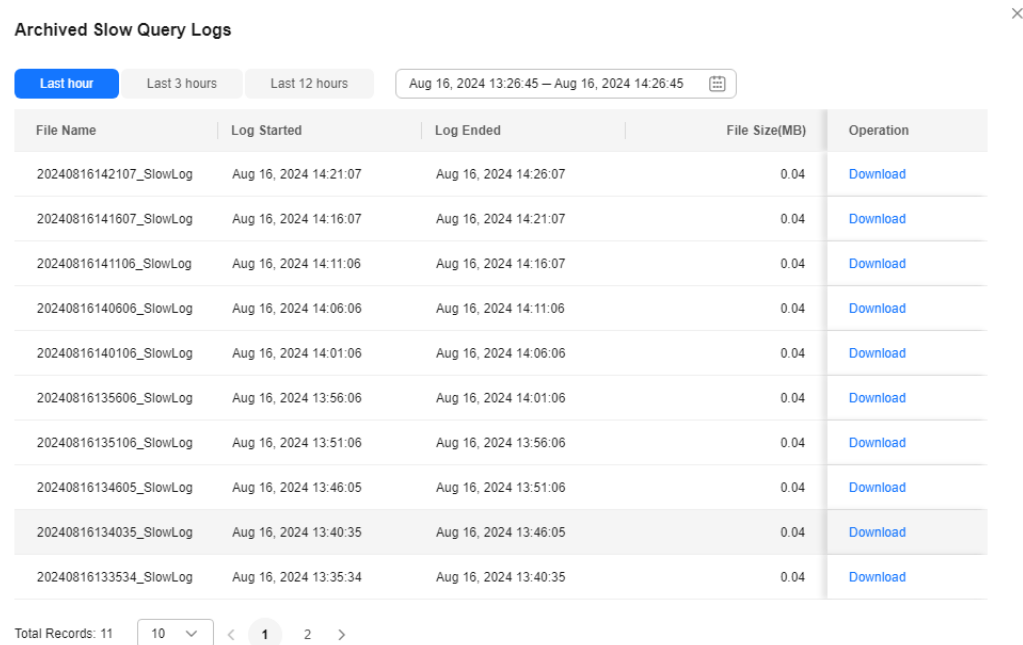
Figure 6-186 Log archiving



Slow query logs generated in the last 10 days are archived.

You can click **Archive History** to view archive records and click **Download** to download archived slow query logs to your local PC.

Figure 6-187 Viewing archive history



6.14.5.2 SQL Statement Concurrency Control

SQL statement concurrency control restricts the execution of SQL statements based on specified rules when there are SQL statements that cannot be optimized timely or a resource (for example, vCPU) bottleneck occurs.

Usage Notes


- RDS for MariaDB using only the engine version 10.5.16.230600 or higher support Concurrency Control.
- The new Concurrency Control rule takes effect only for the current DB instance.
- If a SQL statement matches multiple concurrency control rules, only the latest rule takes effect.

- SQL statements that have been executed before a concurrency control rule is added are not counted.
- Keywords in a concurrency control rule are sorted in a specific order, and the system will match them from first to last. For example, if one rule contains the keyword **a~and~b**, the system only matches **xxx a>1 and b>2**.
- If the replication delay is too long, adding or deleting a concurrency control rule for a read replica does not take effect immediately.
- Empty characters before and after each keyword will be ignored, for example, spaces, \n, \r, and \t.
- SQL statement concurrency control does not limit concurrency for:
 - System tables
 - SQL statements used to query data, for example, **SELECT sleep(xxx)**
 - Account **root**
 - SQL statements in stored procedures, triggers, and functions

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

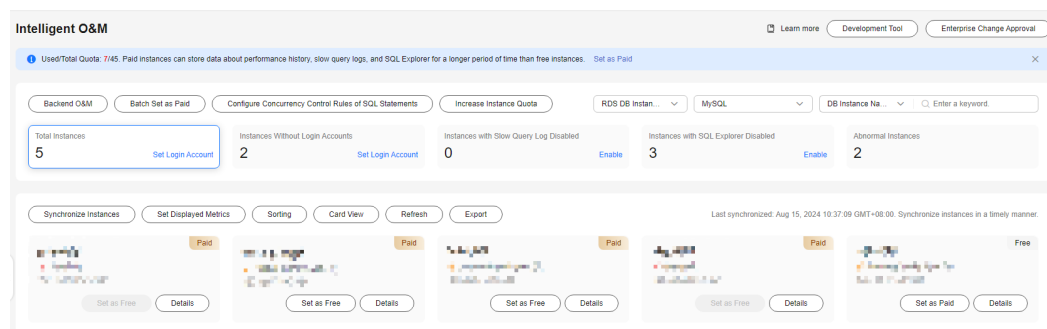
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 6-188 Searching for instances

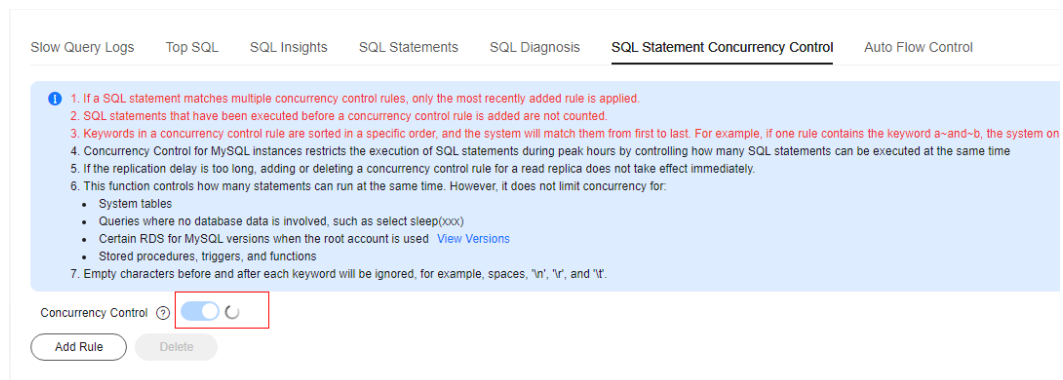


Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL > SQL Statement Concurrency Control**.

Step 8 On the displayed page, toggle on **Concurrency Control**.

Figure 6-189 Enabling SQL statement concurrency control



Step 9 Click **Add Rule**. In the displayed dialog box, specify **SQL Type**, **Keyword**, and **Max. Concurrency**.

Figure 6-190 Add Rule

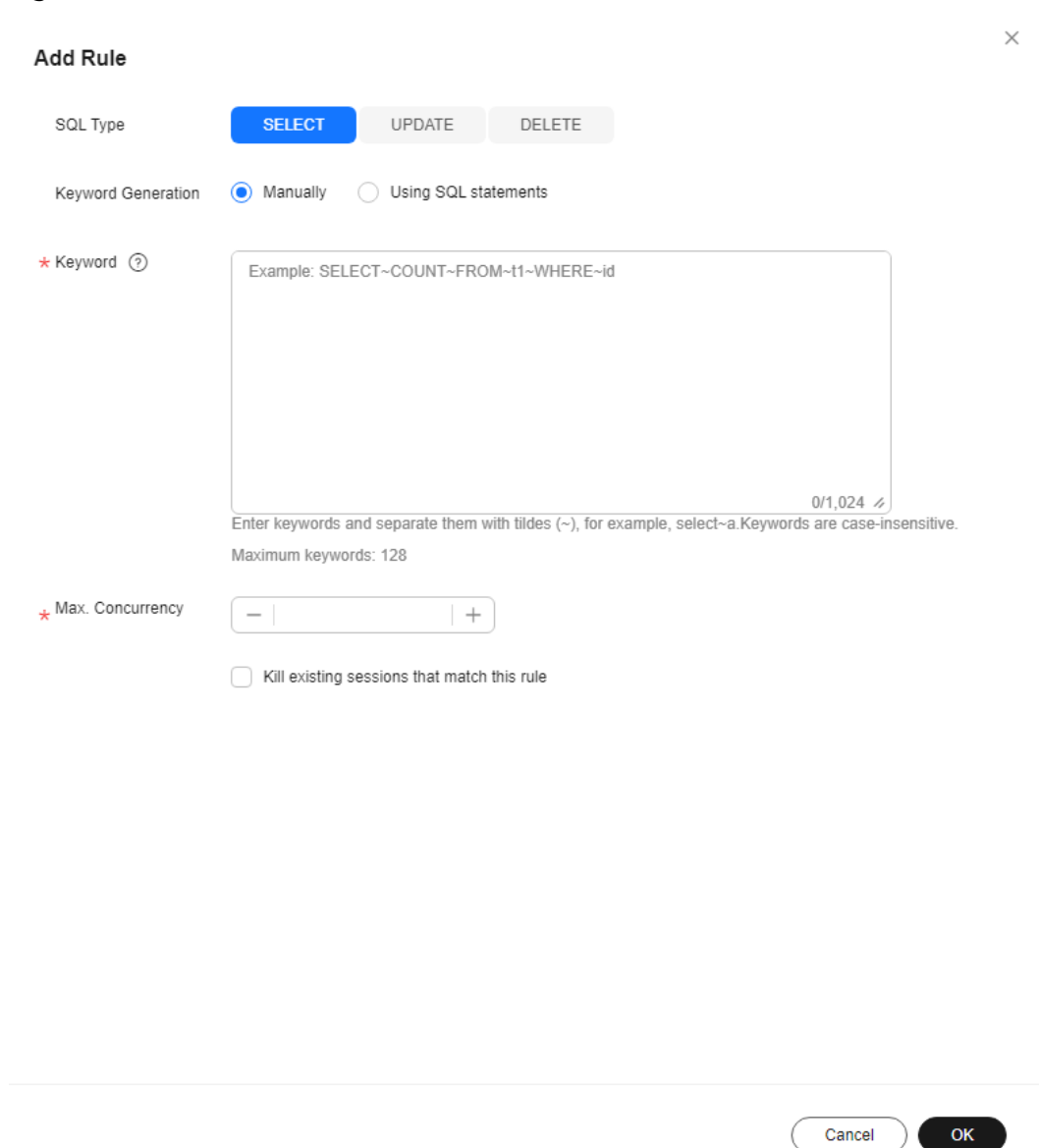


Table 6-19 Parameters

Parameter	Remarks
SQL Type	The options are SELECT , UPDATE , and DELETE .
Keyword	A maximum of 128 case-insensitive keywords are supported. You can specify keywords in either of the following ways: <ul style="list-style-type: none">• Enter keywords. Take select~a as an example. select and a are two keywords contained in a concurrency control rule. The keywords are separated by a tilde (~). In this example, the rule restricts the execution of only the SQL statements containing keywords select and a.• Generate keywords from a SQL statement. You can enter an SQL statement to the text box and click Generate Keyword. Keywords generated from an original SQL statement are only for reference.
Max. Concurrency	SQL statements that meet the specified SQL type and keyword and exceed the value of Max. Concurrency will not be executed.
Kill existing sessions that match this rule	If this option is selected, the connection sessions of user root will not be killed.

Step 10 Confirm the settings and click **OK**.

If a SQL statement concurrency control rule is no longer needed, click **Delete** in the **Operation** column.

----End


6.14.5.3 Auto Flow Control

Auto Flow Control allows you to set criteria, such as the vCPU threshold and maximum number of active connections. When the criteria are met, auto flow control will be automatically triggered to ensure stability of your workloads.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

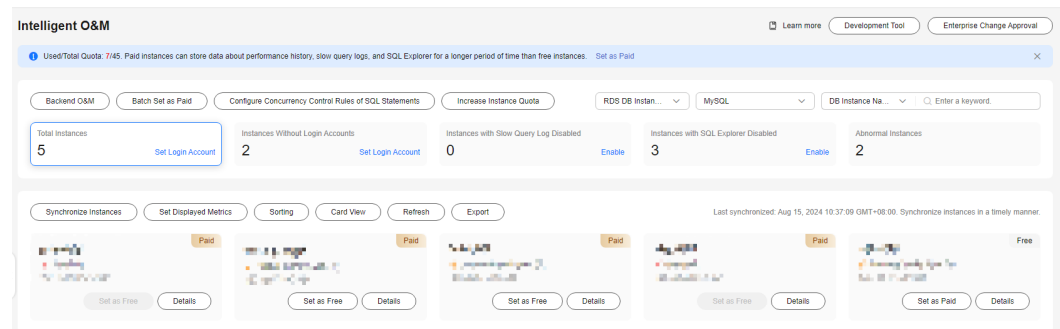
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

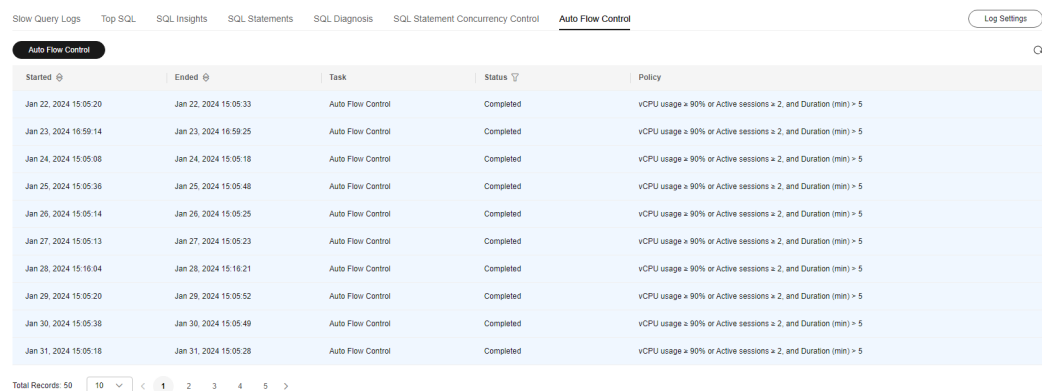
Figure 6-191 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL > Auto Flow Control**.

Figure 6-192 Auto flow control page



Auto flow control is not available to free instances. To use the function, set free instances as paid instances or subscribe to **Intelligent O&M**.

Step 8 Click **Auto Flow Control**.

Step 9 In the displayed dialog box, set the control range, time, and policy and click **OK**.

Figure 6-193 Configuring auto flow control criteria

✕

Auto Flow Control

* Auto Flow Control ?

Range

Database

Ensure that the database you select is consistent with the one specified in your SQL statements, or the auto flow control rule will fail.

Username

Time

* Time Window ?

* Max. Duration Last minute Last 5 minutes Last 10 minutes Last 15 minutes

Policy

* vCPU usage (%) \geq or \geq

and Duration (min)

* Max. Active Connections

To set a custom time window for auto flow control, contact customer service to apply for required permissions. If you have obtained the permissions, you can set a time window from 00:00 to 23:59.

Figure 6-194 Time

Time

* Time Window ?

* Max. Duration Last minute Last 5 minutes Last 10 minutes Last 15 minutes

Step 10 After auto flow control is enabled, determine whether to kill sessions based on service requirements. For details, see [Real-Time Sessions](#).

----End


6.14.6 Storage Analysis

Storage occupied by data and logs and historical changes of storage usage are important for database performance. The **Storage Analysis** page displays storage overview and disk space distribution of your instance. In addition, DAS can estimate the available days of your storage based on historical data and intelligent algorithms, so that you can scale up storage in a timely manner. **Auto Scale**, **Tablespaces**, **Top 50 Databases**, and **Top 50 Tables** are also available on this page.

Viewing Storage Space Usage

Step 1 Log in to the Huawei Cloud console.

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

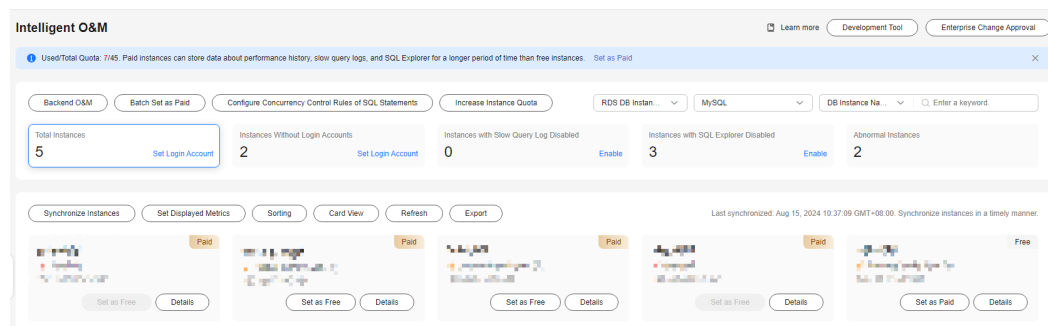
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

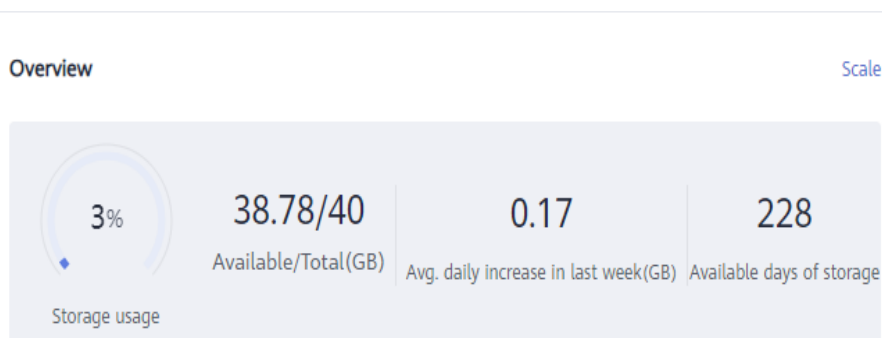
Figure 6-195 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 Choose **Storage Analysis**. In the **Overview** area, view the space usage.

Figure 6-196 Overview



- The following information is displayed:
 - Storage usage
 - Available and total storage
 - Average daily increase in last week
 - Available days of storage

 **NOTE**

If the average daily increase in last week is 0 GB, the estimated available days of storage are unlimited and are not displayed.

- If the space is insufficient, click **Scale** in the upper right corner.

----End

Tablespaces

This function helps you diagnose exceptions of tables, for example, counting tables with abnormal tablespace growth, tables without primary keys, and tables without indexes.

Both automatic diagnosis and manual diagnosis are supported.

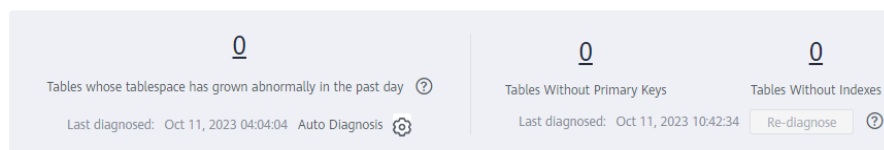
 **NOTE**

- Tablespaces function is not available to free instances. To use the function, set free instances as paid instances or subscribe to **Intelligent O&M**.
- If the number of tables exceeds 5,000, manual diagnosis cannot be used.
- If the CPU usage exceeds 90%, manual diagnosis cannot be used.
- Tables in the **Top 50 Tables** are automatically diagnosed. Scope for manual table diagnosis is not limited.

In the **Tablespaces** area, you can view tablespace diagnosis information.

Figure 6-197 Tablespaces


Tablespaces



- **Auto Diagnosis**

The system automatically diagnoses tables at about 04:00 every day.

In the left part of the **Tablespaces** area, you can view tables whose tablespace has grown abnormally in the past day. You can click the number to view the diagnosis details.

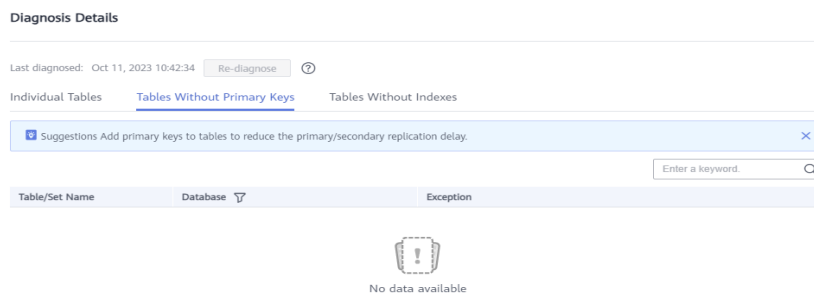
Any table whose tablespace has grown by more than 10,240 MB in the past day is counted. You can also click  on the right of **Auto Diagnosis** to set the upper limit for daily tablespace increase.

- **Manual Diagnosis**

Click **Re-diagnose** to manually trigger a diagnosis task. This operation can only be performed once every 5 minutes.

After the diagnosis is successful, you can view the number of tables without primary keys and indexes. You can click a number to view the diagnosis details.

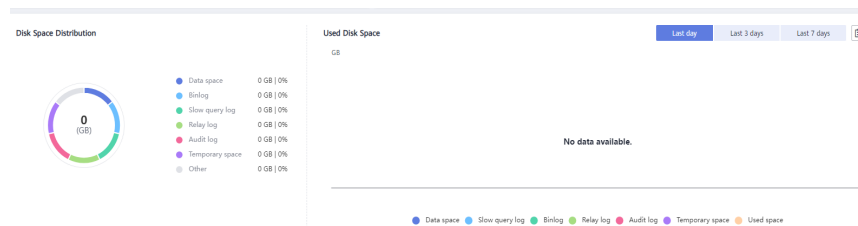
Figure 6-198 Viewing diagnosis details



Viewing Disk Space Distribution

You can view the distribution and change trend of the storage space.

Figure 6-199 Viewing disk space distribution



NOTE

If the total number of files in your disk space (including data space, binlog space, slow query log space, relay log space, audit log space, temporary space, and other space) exceeds 10,000, information about the files or display disk space distribution and usages over time will not be collected on the console. This prevents performance slowdowns caused by collecting statistics on too many files. If this happens, contact technical support.

- **Data space:** Disk space occupied by user data
- **Binlog:** Disk space occupied by binlogs
- **Slow query log:** Disk space occupied by slow logs
- **Relay log:** Disk space occupied by relay logs
- **Audit log:** Disk space occupied by audit logs
- **Temporary space:** Disk space occupied by temporary files
- **Other:** Disk space reserved by the operating system for system users. About 5% of the disk space is reserved in Linux.

Top Databases and Tables by Physical File Size

You can view the top 50 databases and tables by physical file size and identify the databases and tables with high usage based on storage space distribution.

Figure 6-200 Viewing top 50 databases and tables

Database	Physical File Size(MB)	Rows	Data Space(MB)	Index Space(MB)	Fragment(MB)	Fragmentation Rate(%)	Operation
mysql	0.422	0			0	0	

Click **View Chart** to view data volume changes in the last 7 days, last 30 days, or a custom time period (spanning no more than 30 days).

NOTE

- DAS collects data at about 04:00 every day.
- Physical file sizes are precisely recorded, but other fields' values are estimated. If there is a large gap between a file size and another field, run `ANALYZE TABLE` on the table.
- A database or table whose name contains special characters, including slashes (/) and #p#p, is not counted.
- If there are more than 50,000 tables in your instance, to prevent data collection from affecting the instance performance, top databases and tables will not be counted.
- Some statistics may be missing because data of database or tables is fluctuating.


6.14.7 Daily Reports

This function allows you to initiate a health diagnosis for your instance and view overall information about the instance status, including slow SQL analysis, all SQL analysis, and performance & storage analysis. You can download and subscribe to analysis reports. A daily diagnosis is recommended.

Procedure

Step 1 Log in to the Huawei Cloud console.

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 6-201 Searching for instances

Intelligent O&M

Used Total Quota: 7/45. Paid instances can store data about performance history, slow query logs, and SQL Explorer for a longer period of time than free instances. Set as Paid

Backend O&M | Batch Set as Paid | Configure Concurrency Control Rules of SQL Statements | Increase Instance Quota | RDS DB Instan... | MySQL | DB Instance Na... | Enter a keyword

Total Instances: 5 | Set Login Account | Instances Without Login Accounts: 2 | Set Login Account | Instances with Slow Query Log Disabled: 0 | Enable | Instances with SQL Explorer Disabled: 3 | Enable | Abnormal Instances: 2

Synchronize Instances | Set Displayed Metrics | Sorting | Card View | Refresh | Export

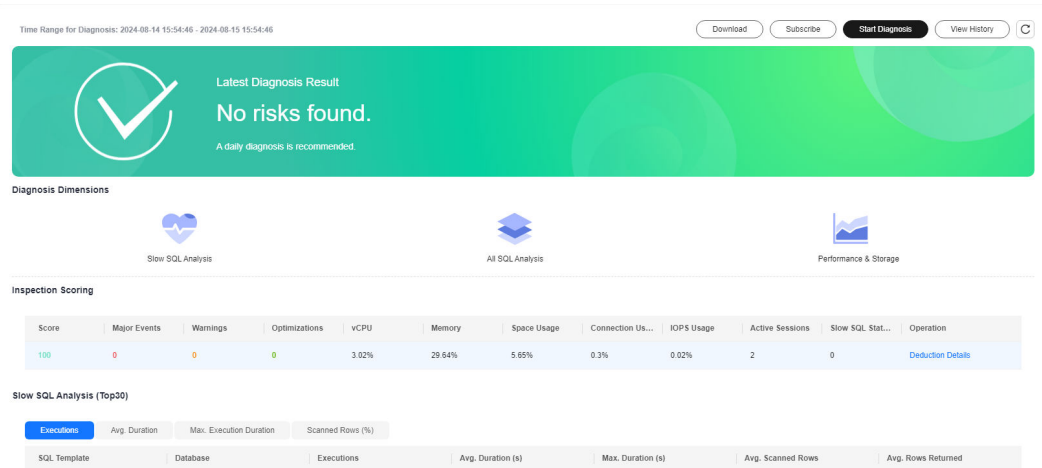
Last synchronized: Aug 15, 2024 10:37:09 GMT+08:00. Synchronize instances in a timely manner.

Instance Name	Status	Actions
mysql-1	Paid	Set as Free Details
mysql-2	Paid	Set as Free Details
mysql-3	Paid	Set as Free Details
mysql-4	Paid	Set as Free Details
mysql-5	Free	Set as Paid Details

Step 6 Locate the target instance and click **Details**.

Step 7 On the displayed page, choose **Daily Reports**.

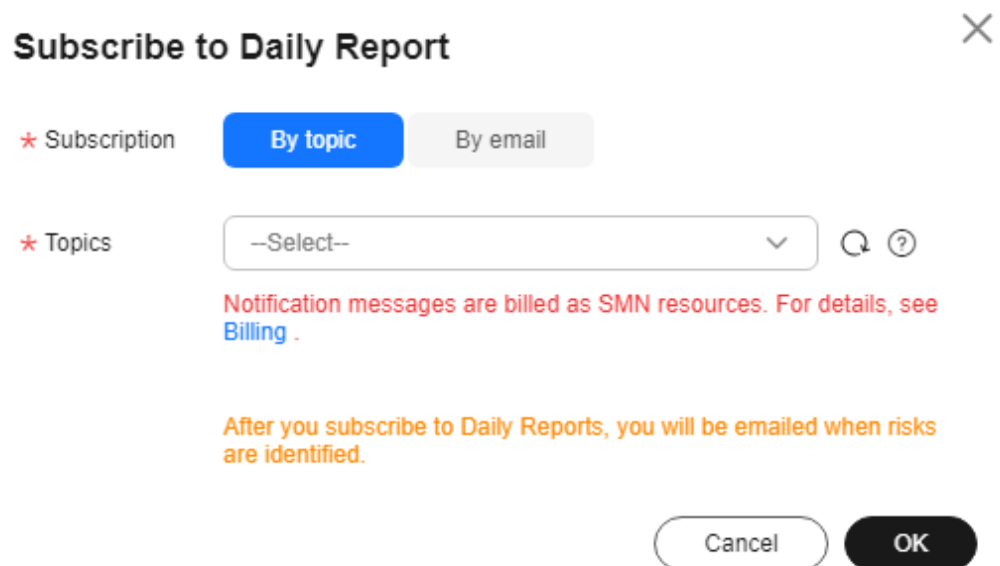
Figure 6-202 Daily reports



You can perform the following operations:

- Click **Download** to download a diagnosis report to your local PC.
- Click **Subscribe** to the subscribe to daily reports. After you subscribe to daily reports, your account will be emailed when risks are identified.

Figure 6-203 Subscribing to daily reports



NOTE

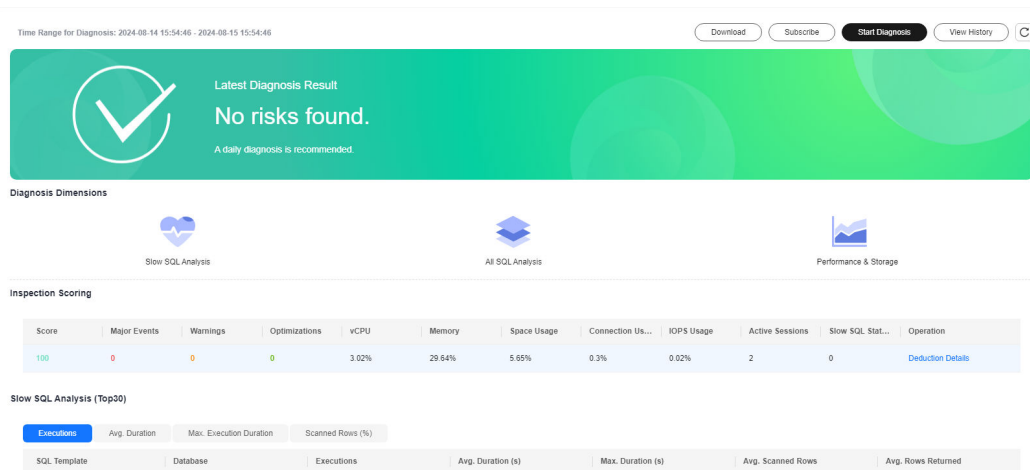
Before subscribing to diagnosis reports, note that:

- The subscription function depends on the Simple Message Notification (SMN) service.
- You can subscribe to daily reports **by topic** or **by email**.

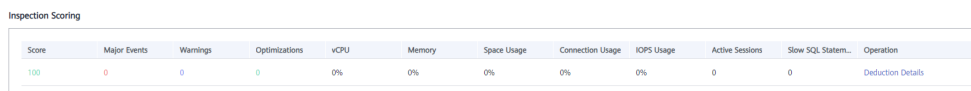
A topic is used to publish messages and subscribe to notifications. If you select **by topic** and the required topic is unavailable, create one first and subscribe to the topic. For details, see [Creating a Topic](#) and [Adding a Subscription](#). Only emails are available for subscribing to topics.

If you select **by email**, you can enter up to 15 email addresses. Separate email addresses with a semicolon (;).

- After you subscribe to daily reports, diagnosis reports will be emailed to you after you manually diagnose your instance and the result is abnormal.
- Click **Start Diagnosis** to diagnose the current instance. After the diagnosis is complete, view the diagnosis result.

Figure 6-204 Viewing diagnosis results

In the **Inspection Scoring** area, you can view the inspection score and details of the current instance. For more information about inspection scoring, see [Inspection Score](#).

Figure 6-205 Viewing inspection scoring results

In the **Slow SQL Analysis** area, you can view the analysis result of slow query logs of the current instance.

Figure 6-206 Slow SQL analysis

Slow SQL Analysis (Top30)

Executions	Avg. Duration	Max. Execution Duration	Scanned Rows (%)		
SQL Template	Executions	Avg. Duration (s)	Max. Duration (s)	Avg. Scanned Rows	Avg. Rows Returned
SELECT sleep(?);	34547	1.00	1.37	0	1
UPDATE student2 S...	21078	1.00	1.94	1	0
select * from test_tb...	17272	0.67	1.07	1000000	1000000
DELETE FROM stud...	4320	1.86	2.01	1	0
select count(1) fro...	2177	0.08	0.14	1000000	1
SELECT count(*) AS ...	6	0.70	0.76	100000	1

In the **All SQL Analysis** area, you can view analysis of all SQL statements of the current instance.

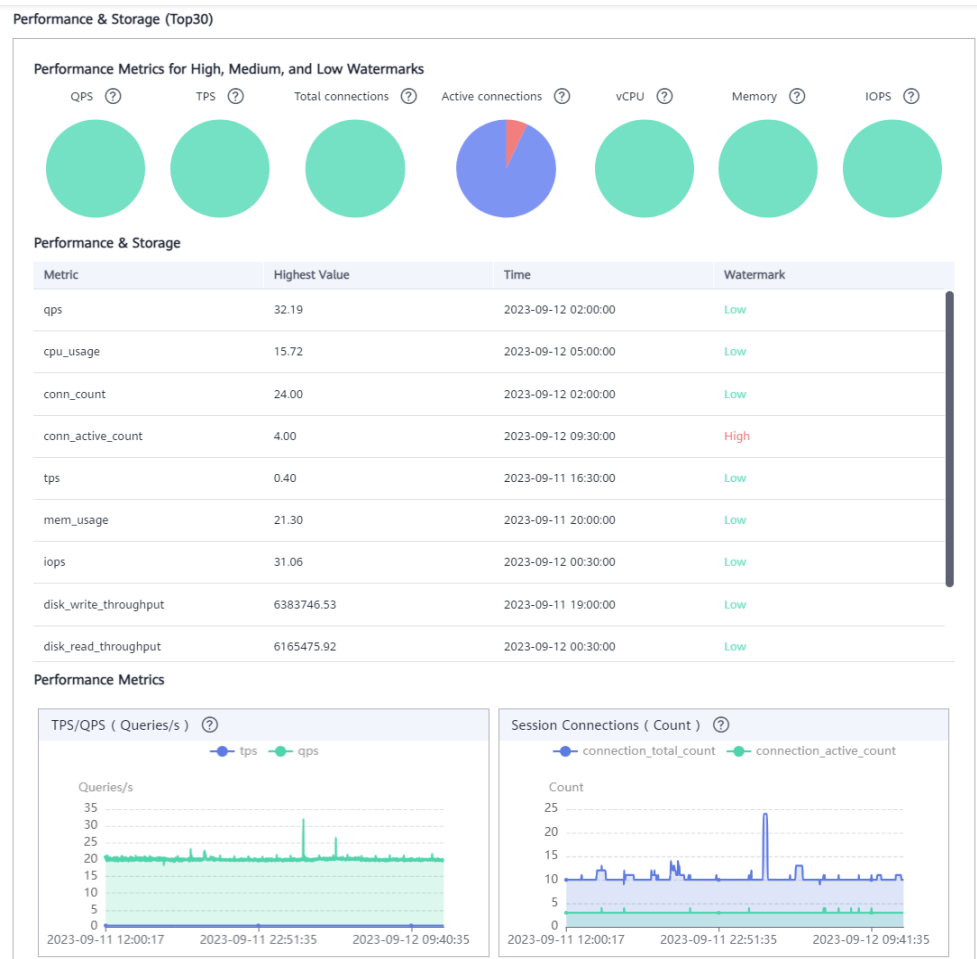
Figure 6-207 All SQL analysis

All SQL Analysis (Top30)

Total Scanned Rows	Total Executions	Avg. Elapsed Time		
SQL Template	Total Executions	Avg. Elapsed Time	Avg. Rows Scanned	Total Scanned Rows
SELECT count(*) AS count...	6	696ms	100K	600K
SHOW GLOBAL STATUS L...	156	0.24ms	848	132.29K
SHOW COLLATION	558	0ms	222	123.88K
UPDATE student2 SET id ...	20866	1s	0.98	20.37K
SELECT count(1) AS table...	31	5.48ms	327	10.14K
SHOW TABLES LIKE ?	5576	0ms	1	5.58K
DELETE FROM student2 ...	4193	1.86s	1	4.19K
SELECT it.*, ic.character_s...	26	0.11ms	87.62	2.28K
SHOW PROCEDURE STAT...	39	0.54ms	38	1.48K

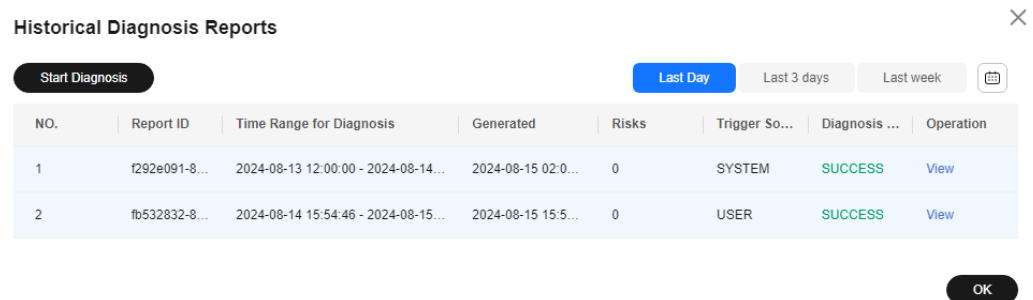
In the **Performance & Storage** area, you can view performance metrics for high, medium, and low watermarks and the trend chart.

Figure 6-208 Performance and storage analysis



- Click **View History** to view historical reports.

Figure 6-209 Viewing diagnosis history



----End

7 GaussDB

7.1 Account Management

7.1.1 Role Management

This section describes how to create one or more roles and grant different permissions to each role.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > Role Management**.
- Step 7** On the role management page, click **Create Role** in the upper left corner.
- Step 8** On the **Basic Settings** tab page, enter a role name (mandatory) and specify other parameters as required.

Figure 7-1 Creating a role

The screenshot shows the 'Create Role' interface. At the top, there is a header 'Create Role' and a navigation button '< Back to Role Management List'. Below the header are three tabs: 'Basic Settings', 'Role Groups', and 'Permissions'. The 'Basic Settings' tab is selected and highlighted with a red border. The form contains the following fields:

- * Role Name**: Text input field containing 'root1'.
- Login**: Checkbox, currently unchecked.
- Password**: Password input field with a strength indicator.
- Confirm Password**: Password input field with a strength indicator.
- Connection Restriction**: Text input field.
- Expires**: Dropdown menu with the text 'Select a time.' and a calendar icon.
- Create Database**: Checkbox, checked.
- Create Role**: Checkbox, checked.
- Inherit Permission**: Checkbox, checked.

- Step 9** (Optional) On the **Role Groups** tab page, select check boxes in columns **Grant** and **With Grant Option** as needed.
- Step 10** (Optional) On the **Permissions** tab page, click **Add**. In the displayed dialog box, specify details such as the resource type, database, and schema.
- Step 11** Confirm the settings, click **Save** in the lower part of the page. In the displayed **SQL Preview** dialog box, click **OK**.
- Step 12** On the role management page, view the created role, or edit and delete the created role.



----End

7.2 Database Management

7.2.1 Creating a Database

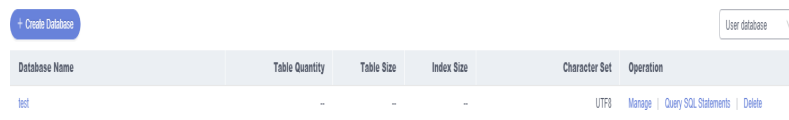
This section describes how to create a database on the DAS console without running SQL commands.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 In the database list of the **Home** page, click **Create Database**.

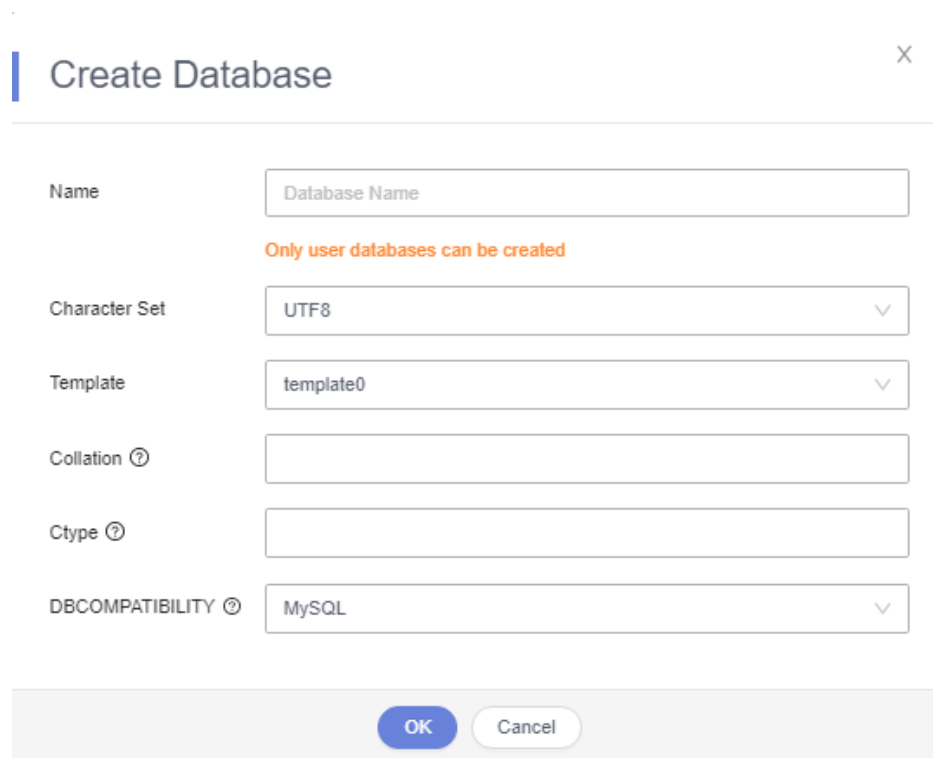
Figure 7-2 Database list



Database Name	Table Quantity	Table Size	Index Size	Character Set	Operation
test	-	-	-	UTF8	Manage Query SQL Statements Delete

Step 7 In the displayed dialog box, enter a database name and specify a character set, template, and other required parameters.

Figure 7-3 Creating a database



Create Database

Name: Database Name

Only user databases can be created

Character Set: UTF8

Template: template0

Collation: ?

Ctype: ?

DBCOMPATIBILITY: MySQL

OK Cancel

Step 8 Click **OK**.

Step 9 View the created database in the database list.

----End

7.2.2 Deleting a Database

This section describes how to drop a database that is no longer needed.

Precautions

Dropped databases cannot be recovered. Exercise caution when performing this operation.

Procedure



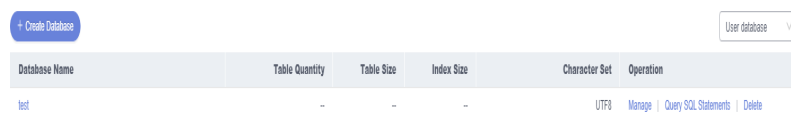
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** In the database list, locate the database you want to delete and click **Delete** in the **Operation** column.

Figure 7-4 Deleting a database



Database Name	Table Quantity	Table Size	Index Size	Character Set	Operation
test	-	-	-	UTF8	Manage Query SQL Statements Delete

- Step 7** In the displayed dialog box, click **Yes**.

----End

7.2.3 Creating a Schema

After a database is created, you need to create a schema because database operations cannot be performed in system schemas. This section describes how to create a schema and execute SQL statements.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** In the database list of the **Home** page, locate the database where you want to create a schema and click **Manage** in the **Operation** column.

Figure 7-5 Database management

Step 7 Click **Create Schema**. On the displayed page, enter a schema name.

Figure 7-6 Creating a schema

Create Schema

* Schema Name

Step 8 Click **OK**. The schema you created appears in the schema list.

----End


7.2.4 Opening a Schema

This section describes how to open a schema on the DAS console.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 In the database list of the **Home** page, locate the database where you want to open a schema and click **Manage** in the **Operation** column.

Figure 7-7 Database management



Step 7 On the **Schemas** tab page, click **Open** in the **Operation** column to go to the **Objects** tab page.

Figure 7-8 Object list



(Optional) Click the name of a schema to go to the **Objects** tab page.

----End

7.2.5 Dropping a Schema

This section describes how to drop a schema that is no longer needed.

Precautions

Dropped databases cannot be recovered. Exercise caution when performing this operation.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** In the database list of the **Home** page, locate the database where you want to drop a schema and click **Manage** in the **Operation** column.

Figure 7-9 Database management

Step 7 Click the **Schemas** tab, locate the schema that you want to drop, and click **Drop** in the **Operation** column.

-----End

7.3 SQL Operations

7.3.1 SQL Query

DAS allows you to easily run various SQL statements in a graphical SQL window and to perform operations on databases, such as adding, deleting, editing, and viewing a database.


Precautions

- After a database is created, you need to create a schema before performing any SQL operations.
- SQL operations are performed on tables and views in a database.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

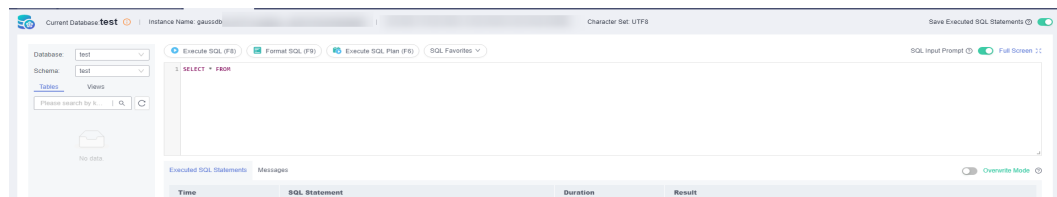
Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

Step 7 Check whether there are any schemas other than system schemas.

- If yes, go to [Step 8](#).
- If not, create one by referring to [Creating a Schema](#). Then, go to [Step 8](#).

Step 8 In the navigation tree on the left of the SQL window, select a table or view.

Figure 7-10 SQL window



You can perform the operations listed in [Table 7-1](#) in the SQL window.

Table 7-1 Function description

Function	Description
Execute SQL	Executes SQL statements. SQL operations are performed on tables and views in a database.
Format SQL	Improves readability of SQL statements. Formatting SQL statements enables statements to be displayed in line break mode, but does not change their logics and semantics. SQL formatting takes effect for all the SQL statements in the SQL window. You cannot format only one selected statement.
Execute SQL Plan	Reports execution of SQL statements to make troubleshooting easy and optimize SQL processing performance.
SQL Favorites	Allows you to add, view, and manage frequently-used SQL statements.
Save Executed SQL Statements	Saves the recently executed SQL statements to the server.
SQL Input Prompt	Helps you quickly enter a specific database, table, or field name when you enter a SQL statement in the SQL window.
Full Screen	Shows SQL statements on a full screen.
Executed SQL Statements	Shows SQL execution details.
Messages	Shows the SQL execution output.
Result Set	Shows SQL execution results. Allows you to view details about a single row, add a row, submit for editing, delete a row, export a row, copy a row, copy a column, set a column, and more.

Function	Description
Overwrite/ Append Mode	<ul style="list-style-type: none">• Append Mode: Each time a SQL statement is executed, the new result set is appended to the previous one.• Overwrite Mode: Each time a SQL statement is executed, the new result set overwrites the previous one.

----End

7.3.2 Executing SQL Statements

This section describes how to execute SQL statements.

Procedure



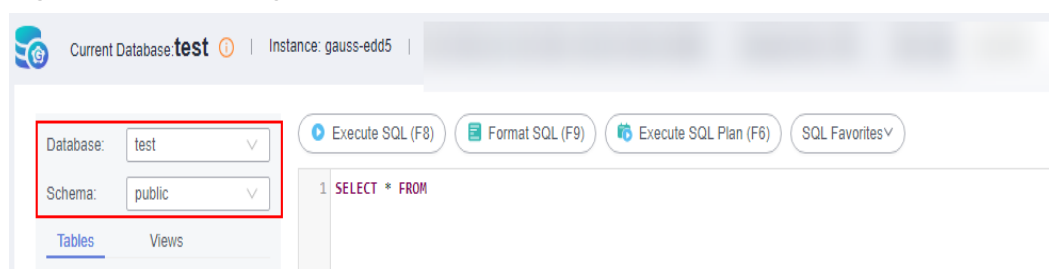
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- Step 7** Select a database and schema.

Figure 7-11 Selecting a database and schema



- Step 8** Enter a SQL statement in the SQL window and click **Execute SQL**.
 - Enabling **SQL Input Prompt** is recommended. It helps you select the required database, table, or field name when you enter a SQL statement in the SQL window.
 - You can execute multiple SQL statements at a time. Separate them using semicolons (;). You can click **Full Screen** to view logics in SQL statements clearly.
 - To execute some of the SQL statements, select the statements before executing them.

- To execute all SQL statements, do not select any SQL statements or select all SQL statements.
- Step 9** View execution details of the current SQL statement and previously executed SQL statements in the lower part of the page.
- Step 10** Click the **Messages** tab, view SQL execution details, including affected rows, progress, and time required.
- Step 11** On the **Result Set** tab, view SQL execution results. You can perform the following operations on the result sets:
- **Copy Row/Copy Column:** copies a row or column for reuse.
 - **Column Settings:** customizes the columns to display when there are a large number of columns in the query result.
 - **Refresh:** refreshes changed data.
 - **Row Details:** displays the column field name, value, and type of the selected row.
 - **Export:** The SQL, CSV, and Excel files are supported. No more than 7.84 MB of data with 10,000 records can be exported. The actual size of an Excel file may exceed 7.84 MB due to its format.

----End

7.3.3 Executing SQL Plan

This section describes how to analyze the execution efficiency of a SQL statement.

Procedure



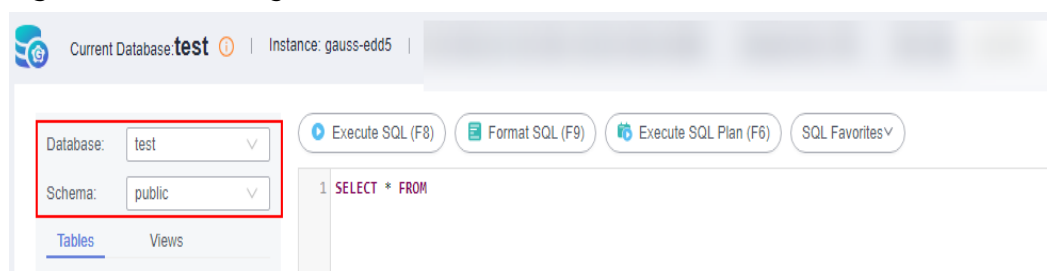
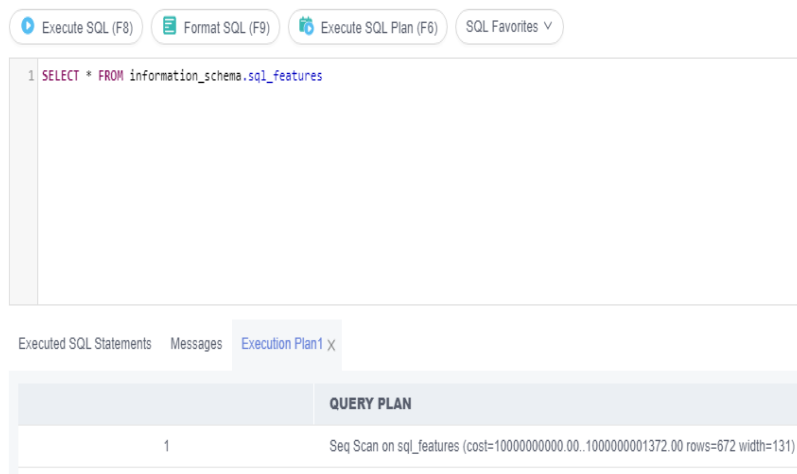
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- Step 7** Select a database and schema.

Figure 7-12 Selecting a database and schema



Step 8 Enter a SQL statement in the SQL window and click **Execute SQL Plan**.

Figure 7-13 Execute SQL Plan



- On the **Executed SQL Statements** tab page, view SQL execution history.
- On the **Messages** tab page, view execution information, including SQL splitting, execution status, and elapsed time.
- On the **Execution Plan** tab page, view SQL execution details. Execution plan details of SQL statements are displayed on different tabs.

----End


7.3.4 SQL Favorites

This section describes how to add frequently-used SQL statements and to view and manage them.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

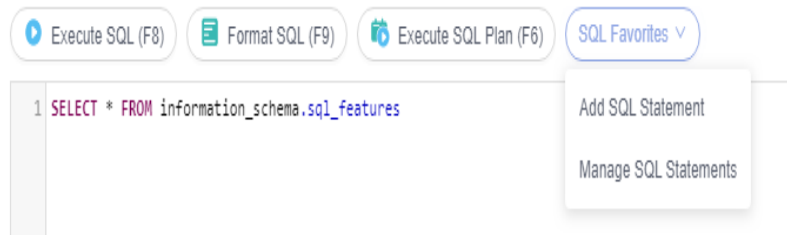
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

Step 7 In the SQL window, click **SQL Favorites**.

Figure 7-14 SQL Favorites



- **Add SQL Statement:** allows you to add frequently-used SQL statements. Specifically, specify a title, select an application scope, enter SQL statements, and then click **Save**.

Figure 7-15 Adding a SQL statement

Add SQL Statement

* Title:

Application Scope: All DB instances Current DB instance Current database

* SQL statement:

```
1 SELECT * FROM information_schema.sql_features|
```

- **Manage SQL Statements:** allows you to manage frequently-used SQL statements, including adding, editing, and deleting SQL statements.

Figure 7-16 Managing SQL statements

Manage SQL Statements ×

All

	Title	Storage Location	SQL statement	Operation
1	test	Instance: gaussdbv...	SELECT * FROM information_schema.sql_features	Edit Delete

Total Records: 1 < 1 > 10 / page Go to 1 Go

----End

7.3.5 SQL History

DAS can save the SQL statements you executed in the SQL window for future view. You can also execute the SQL statements again with no need to enter them again in the SQL window.

Prerequisites

You have enabled **Save Executed SQL Statements** in the upper right corner of the **SQL Query** page. After this function is enabled, executed SQL statements will be saved on the DAS management host.

Constraints on Usage

SQL statement execution records can be stored for up to one year.

Procedure



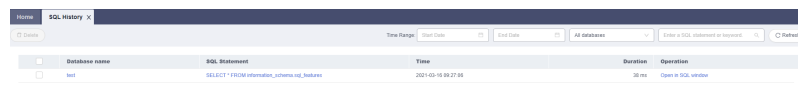
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL History**.
- Step 7** On the displayed page, search for execution information about the target SQL statement by time range, database name, or keyword.

Figure 7-17 SQL history



Database name	SQL Statement	Time	Duration	Operation
test	SELECT * FROM information_schema.col_test	2021-03-16 14:27:55	35 ms	Open in SQL window

- To access the **Database Management** page, click a database name.
- To copy a SQL statement, click it in the **SQL Statement** column.
- To execute a SQL statement, click **Open in SQL window** in the **Operation** column.

----End

7.4 Table Management

7.4.1 Opening a Table

Graphical window for creating a GaussDB table is not available. To create a table, execute SQL statements in the SQL window. For details, see [SQL Query](#).

After a table is created, you can open the table on the DAS console and view data in the table.

Precautions

Tables in GaussDB databases do not have primary keys and their data can only be queried.

Procedure



- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**. On the displayed **Objects** tab, choose **Tables** on the left.
- Step 7** Locate the table you want to open and click **Open** in the **Operation** column.

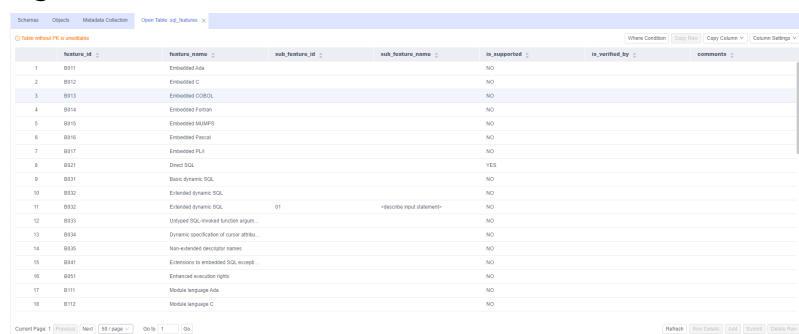
Figure 7-18 Opening a table



Views	Table Name	Rows (Estimated)	Table Size	Index Size	Character Set	Operation
Stored Procedures	sql_features	672	96KB	0B	UTF8	Query SQL Statements Open View
Triggers	sql_implementation_info	12	48KB	0B	UTF8	Query SQL Statements Open View
Sequences	sql_languages	4	48KB	0B	UTF8	Query SQL Statements Open View

- Step 8** On the displayed page, view table details.

Figure 7-19 Table details



Number_id	feature_name	sub_feature_id	sub_feature_name	is_supported	is_verified_by	comments
1	B011		Embedded Ada	NO		
2	B012		Embedded C	NO		
3	B013		Embedded COBOL	NO		
4	B014		Embedded Fortran	NO		
5	B015		Embedded HLL/PL/PS	NO		
6	B016		Embedded Pascal	NO		
7	B017		Embedded PL/I	NO		
8	B021		Direct SQL	YES		
9	B031		Basic dynamic SQL	NO		
10	B032		Extended dynamic SQL	NO		
11	B033		Embedded dynamic SQL	NO		
12	B034	01	Embedded SQL: embedded function syntax	NO		-recursive read statement
13	B034		Dynamic specification of cursor attrbu...	NO		
14	B035		Non-identifier names	NO		
15	B041		Extensions to embedded SQL: except...	NO		
16	B051		Enhanced execution rights	NO		
17	B111		Module language Ada	NO		
18	B112		Module language C	NO		

You can also perform operations described in [Table 7-2](#) on the table.

Table 7-2 UI operations

Name	Description
Where Condition	Filters records.
Copy Row	Copies data of the selected row. Specifically, double-click the target row and then click Copy Row .
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.
Column Settings	Allows you to set the columns you want to display.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.

----End

7.4.2 Viewing Details of a Table

This section describes how to view basic information of a table.

Procedure



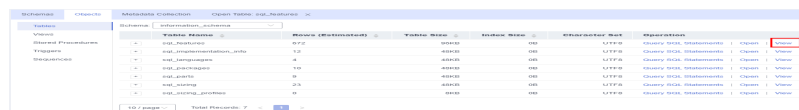
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab, choose **Tables** on the left. In the table list, locate the table whose details you want to view and click **View** in the **Operation** column.

Figure 7-20 Viewing details of a table



Step 8 In the displayed dialog box, view basic information of the table.

----End

7.5 View Management

7.5.1 Opening a View

Graphical window for creating a GaussDB view is not available. To create a view, execute SQL statements in the SQL window. For details, see [SQL Query](#).

After a view is created, you can open the view on the DAS console and view data in it.


Precautions

Views do not have primary keys and their data can only be queried.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

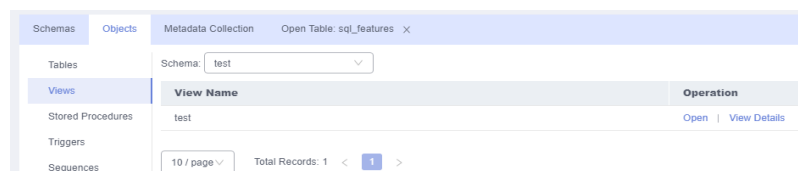
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**. On the displayed **Objects** page, choose **Views**.

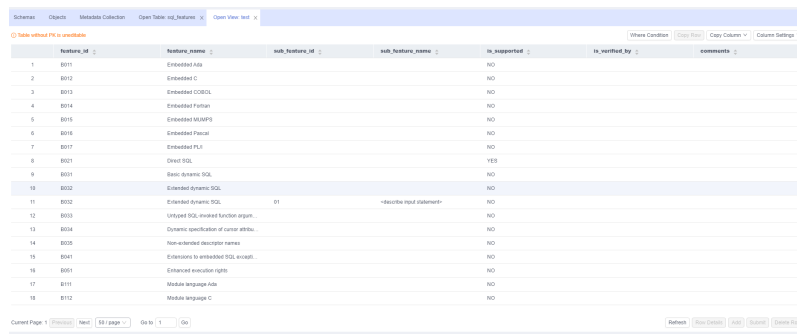
Step 7 Locate the view you want to open and click **Open** in the **Operation** column.

Figure 7-21 Opening a view



Step 8 On the displayed page, view details of the view.

Figure 7-22 Viewing details of the view



You can also perform operations described in Table 7-3 on the view.

Table 7-3 UI operations



Name	Description
Where Condition	Filters records.
Copy Row	Copies data of the selected row. Specifically, double-click the target row and then click Copy Row .
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.
Column Settings	Allows you to set the columns you want to display.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.

----End

7.5.2 Viewing Details of a View

This section describes how to view details of a view on the DAS console. The details show the SQL statement for creating the view.

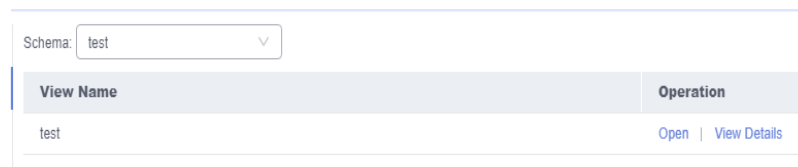
Procedure

- Step 1** Log in to the Huawei Cloud console.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 On the displayed **Objects** tab, choose **Views** on the left, locate the view whose details you want to view and click **View Details** in the **Operation** column.

Figure 7-23 Viewing details of a view



Step 8 In the displayed dialog box, view the SQL statement used to create the view.

----End

7.6 Stored Procedure Management

7.6.1 Creating a Stored Procedure

A stored procedure consists of a set of SQL statements that can complete specific tasks or process complex services. This section describes how to create a stored procedure. You can use loop statements in a stored procedure to insert objects repeatedly.


Prerequisites

- You have obtained the CREATE ROUTINE permission.
- You have obtained the EXECUTE permission.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

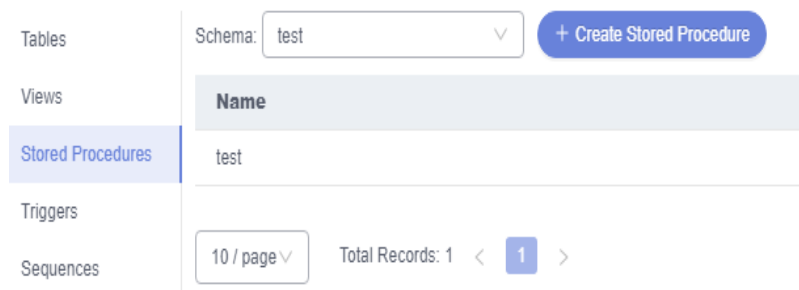
Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

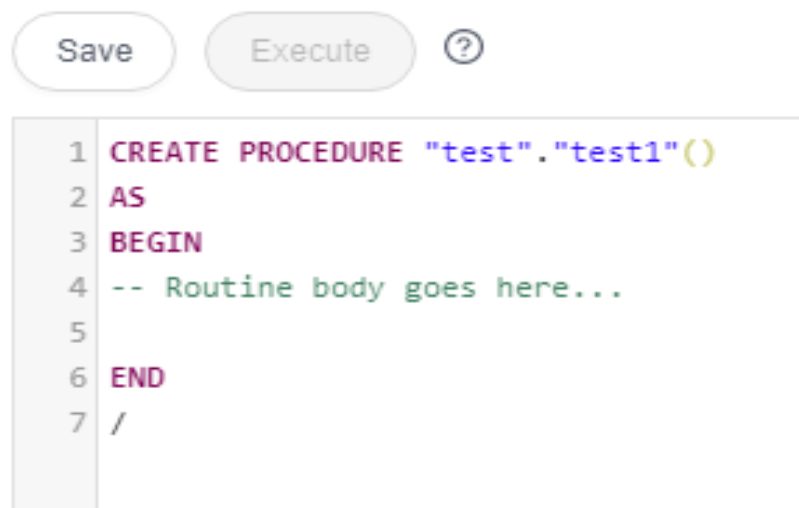
Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**. On the displayed **Objects** page, choose **Stored Procedures**.

Step 7 Click **Create Stored Procedure**.

Figure 7-24 Stored procedures

Step 8 In the displayed dialog box, enter a stored procedure name, select a type, and click **OK**.

Figure 7-25 Creating a stored procedure

Step 9 On the displayed page, enter the stored procedure information and click **Save**.
----End

7.6.2 Altering or Executing a Stored Procedure

This section describes how to alter or execute a stored procedure.


Usage Notes

Improper alterations on a stored procedure will cause instance or service exceptions.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

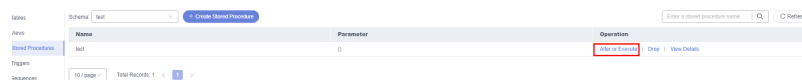
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**. On the displayed **Objects** page, choose **Stored Procedures**.

Step 7 Locate the stored procedure you want to alter or execute and click **Alter or Execute** in the **Operation** column.

Figure 7-26 Stored procedures



Step 8 On the displayed page, enter the required SQL statement and click **Save**.

Figure 7-27 Altering or executing a stored procedure



```

1 CREATE OR REPLACE PROCEDURE test.test()
2 AS DECLARE
3 BEGIN
4 -- Routine body goes here...
5
6 END
7 ;
8 /
9

```

Step 9 Click **Execute** to set the input parameters of the stored procedure.

Step 10 Ensure that the settings are correct and click **OK**.

Step 11 After the SQL statement is executed, view the execution status on the **Messages** tab in the lower part of the page.

----End

7.6.3 Viewing Details of a Stored Procedure

This section describes how to view details of a stored procedure on the DAS console. The details show the SQL statement for creating a stored procedure.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**. On the displayed **Objects** page, choose **Stored Procedures**.
- Step 7** Locate the stored procedure whose details you want to view and click **View Details** in the **Operation** column.

Figure 7-28 Stored procedures



- Step 8** In the displayed dialog box, view the SQL statement used to create the stored procedure.

----End



7.6.4 Dropping a Stored Procedure

This section describes how to drop a stored procedure that is no longer needed.

Precautions

Dropped stored procedures cannot be recovered. Exercise caution when performing this operation.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

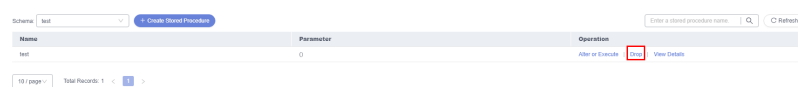
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**. On the displayed **Objects** page, choose **Stored Procedures**.

Step 7 Locate the stored procedure you want to drop and click **Drop** in the **Operation** column.

Figure 7-29 Dropping a stored procedure



Step 8 In the displayed dialog box, click **Yes**.

----End

7.7 Trigger Management

7.7.1 Viewing Details of a Trigger


Graphical window for creating a GaussDB trigger is not available. To create a trigger, execute SQL statements in the SQL window. For details, see [SQL Query](#).

After a trigger is created, you can view its details on the DAS console.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 On the **Objects** tab page, choose **Triggers**.

Step 8 In the right pane, locate the trigger whose details you want to view and click **View Details** to view the SQL statement used to create the trigger.

----End

7.8 Sequence Management

7.8.1 Viewing Details of a Sequence

There are no graphical windows for creating a GaussDB sequence. To create a sequence, execute SQL statements in the SQL window. For details, see [SQL Query](#).

After a sequence is created, you can view its details on the DAS console.

Procedure



- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the **Objects** tab page, choose **Sequences**.

Figure 7-30 Viewing a sequence



Sequence Name	Data Type	Starting Value	Increment	Operation
sequence01	bigint	1	1	View Details

- Step 8** In the right pane, locate the sequence you want to view and click **View Details** in the **Operation** column.

----End

7.9 Data Import and Export

7.9.1 Importing Data

This section describes how to import data from your local PC or an OBS bucket for data backup and migration.

Usage Notes


- Import data into a table for backup or migration. If you import a CSV or SQL file, the file must have the same data type as the target table.

- Only one file that is no larger than 1 GB can be imported at a time.
- Only data files in the CSV or SQL format can be imported. If there are more than 10,000 instance tables, CSV cannot be used.
- Binary fields such as BINARY, VARBINARY, TINYBLOB, BLOB, MEDIUMBLOB, and LONGBLOB are not supported.
- The size of a single SQL statement to be imported must be less than 100 MB.
- Only OBS buckets of the current IAM account can be imported.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Import**.

Step 7 Click **Create Task**.

Figure 7-31 Creating an import task

The screenshot shows the 'Create Task' dialog box with the following fields and options:

- Import Type:** Radio buttons for 'sql' (selected) and 'CSV'.
- File Source:** Radio buttons for 'Upload file' (selected) and 'Choose from OBS'.
- Attachment Storage:** A dropdown menu showing '5257', a 'Bucket ACL Info' button, and a link 'No OBS bucket? Create OBS Bucket'.
- Attachment:** A dashed box containing a plus sign and the text 'Click here to upload a file, or drag one here. (.sql)'. Below it is a warning: 'Upload only one attachment that is no larger than 1 GB.'
- Database:** A dropdown menu showing 'prd'.
- Charset:** Radio buttons for 'UTF8' (selected), 'GBK', and 'Auto Detect'.
- Options:** Two checkboxes: 'Ignore errors, that is, skip the step where the SQL statement fails to be executed.' (unchecked) and 'Delete the uploaded file upon an import success.' (checked).
- Remarks:** A large empty text area.
- Buttons:** 'Create' and 'Cancel' buttons at the bottom.

Table 7-4 Parameter description

Parameter	Description
Import Type	Set Import Type to sql or CSV .
File Source	<p>Import a file from your local PC or an OBS bucket.</p> <ul style="list-style-type: none">• Upload file If you select Upload file for File Source, you need to set Attachment Storage and upload the required file. To keep your data secure, provide your own OBS bucket to store the file you uploaded. In this way, DAS automatically connects to your OBS bucket for in-memory reading. No data is stored on DAS. Creating OBS buckets is free of charge, but saving files will incur certain costs. If you select Delete the uploaded file upon an import success, the file you uploaded will be automatically deleted from the OBS bucket after being imported to the destination database.• Choose from OBS If you select Choose from OBS for File Source, you need to select a file from the bucket. The file uploaded from an OBS bucket will not be deleted upon an import success.
Attachment Storage	<p>Select an OBS bucket to store the file. Click Bucket ACL Info to check whether a public OBS bucket is selected.</p> <ul style="list-style-type: none">• SAFE: The bucket ACL permission set does not contain ALL USERS.• WARN: The bucket ACL permission set contains ALL USERS.• UNKNOWN: The bucket ACL permission set is unknown, maybe due to the lack of IAM permissions. You are advised to go to the OBS page to view the bucket ACL configuration.
Database	Select the database that you want to import the file to.
Charset	Select a charset as needed.
Options	<p>If you select Ignore errors, that is, skip the step where the SQL statement fails to be executed, the system will skip any errors detected when SQL statements are being executed.</p> <p>If you select Delete the uploaded file upon an import success, the file you uploaded will be automatically deleted from the OBS bucket after being imported to the destination database. This option is only available to the files uploaded from your local PC.</p>
Remarks	Enter remarks as required.

Step 8 After setting import parameters, click **Create**.

Confirm the information again before you click **OK** because original data may be overwritten after data import.

Step 9 On the displayed page, view import progress in the task list.

Click **Details** in the **Operation** column to view task details.

----End

7.9.2 Exporting Data

DAS allows you to export a large amount of data at a time to facilitate data query or to back up data for migration. This section describes how to export data.

DAS allows you to export an entire database, some data tables, or result sets of SQL statements.

Usage Notes

- If you do not select **Generate a file for each table** when exporting data, the exported data file is in **.zip** format. Data files in this format cannot be directly imported. You need to decompress the file before importing it again.
- If **Generate a file for each table** is selected during data export, the exported data file is in **.sql** or **.csv** format. In this case, the exported data file can be directly imported again.
- If you export over 10,000 instance tables by following [Exporting a Database](#), an error message will be displayed indicating that there are too many tables and data cannot be exported. In this case, perform steps in [Exporting SQL Results](#) instead.
- Only OBS buckets of the current IAM account can be exported.


Prerequisites

You have created a user database on the DAS console. For details, see [Creating a Database](#).

Exporting a Database

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

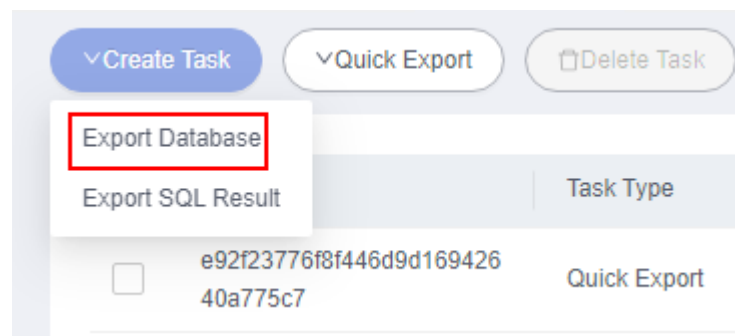
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

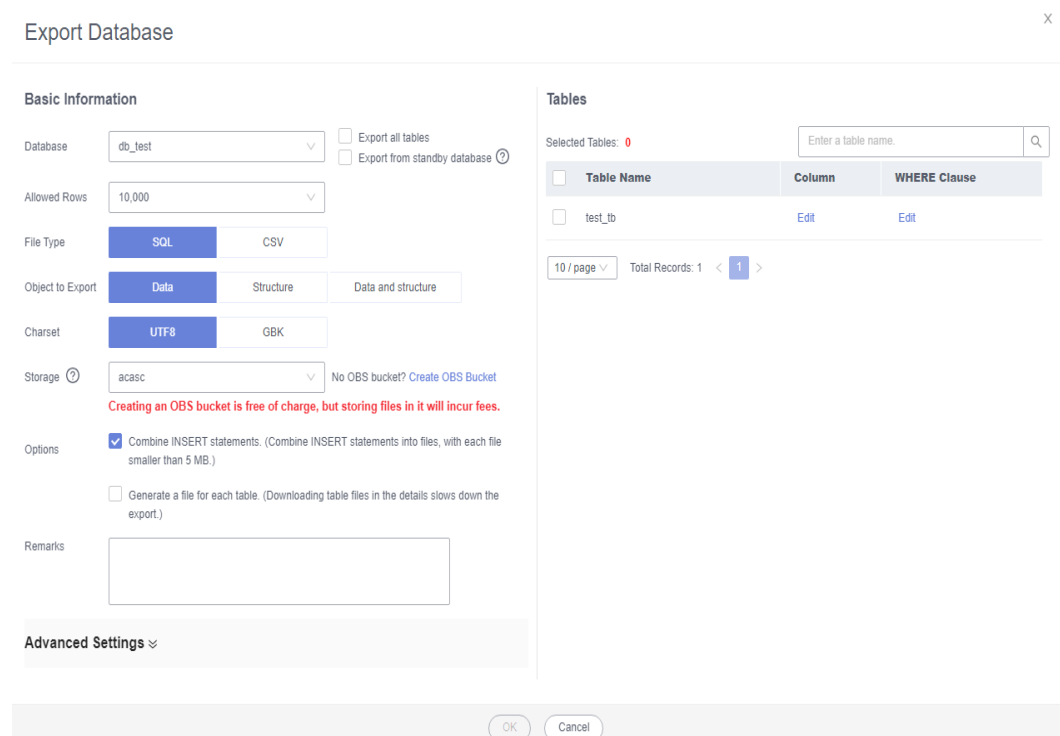
Step 7 In the upper left corner of the page, click **Create Task** and choose **Export Database**.

Figure 7-32 Creating a task for exporting a database



Step 8 In the displayed dialog box, configure basic information and advanced settings as required.

Figure 7-33 Creating a task for exporting a database



- If you select **Export all tables**, data in an entire database or in specific tables will be exported.
- Databases are classified into user databases and system databases. System database cannot be exported. If system database data is required, deploy system database services in a user database, so that you can export the system database data from the user database.
- DAS connects to your standby database to export data. This prevents the primary database from being affected by data export. However, if the standby database has a high replication delay, the exported data may not be the latest.
- DAS does not store any user data. The exported data files are stored in the OBS bucket that you have created. You can specify the storage path. You can

click **Bucket ACL Info** in the **Create Task** dialog box to check whether a public OBS bucket is selected.

- Creating OBS buckets is free of charge, but saving files will incur certain costs.

Step 9 After settings are complete, click **OK**.

Step 10 In the task list, locate the created task and view the task ID, type, status, and progress.

Step 11 Click **Details** in the **Operation** column to view task details.

Figure 7-34 Task list


Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
4c341463a2146b7b20584c430200140	Database	db_test	2023-07-14 10:42:10	2023-07-14 10:42:11	260.89 KB	SQL	Successful	1 second	10000	100%		Details Download
#9202377804460916942640a775c7	Quick Export	db_test	2023-07-14 10:39:20	2023-07-14 10:39:21	1.61 MB	SQL	Successful	1 second	100000	100%		Details Download

----End

Exporting SQL Results

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

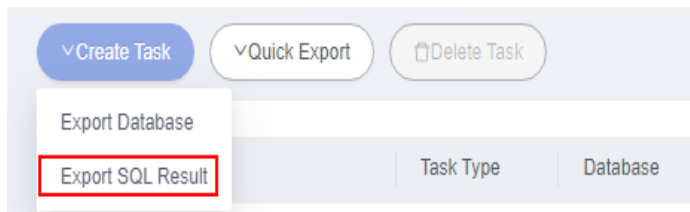
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

Step 7 In the upper left corner of the page, click **Create Task** and choose **Export SQL Result**.

Figure 7-35 Creating a task for exporting SQL results



Step 8 In the displayed dialog box, configure basic information and advanced settings as required.

Figure 7-36 Creating a task for exporting SQL results

Export SQL Result X

Basic Information

Database: Export from standby database ?

Allowed Rows:

File Type: SQL-Insert CSV

Charset: UTF8 GBK

Storage ?: [No OBS bucket? Create Bucket](#)

Creating an OBS bucket is free of charge, but storing files in it will incur fees.

Options: Combine INSERT statements. (Combine INSERT statements into files, with each file smaller than 5 MB.)
 Generate one file for each result.

SQL to Execute:

Remarks:

Advanced Settings ∨

- In a SQL result export task, the executed SQL statements cannot exceed 5 MB.
- To export multiple SQL result sets at a time, enter SQL statements in the SQL text box. Enter each SQL statement on a separate line and add a semicolon (;) at the end. After the export task is complete, SQL files are generated. One SQL statement corresponds to one file.
- DAS does not store any user data. The exported data files are stored in the OBS bucket that you have created.
- You can click **Bucket ACL Info** in the **Create Task** dialog box to check whether a public OBS bucket is selected.
- Creating OBS buckets is free of charge, but saving files will incur certain costs.

Step 9 After settings are complete, click **OK**.

Step 10 In the task list, locate the created task and view the task ID, type, status, and progress.

Step 11 Click **Details** in the **Operation** column to view task details.

Figure 7-37 Task list

Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
<input type="checkbox"/> 0C0c1770206848340551107750142016	SQL Result	db_test	2023-07-14 10:4 8:30	2023-07-14 10:4 8:30	200.84 KB	SQL Result	Successful	1 second	10000	100%		Details Download
<input type="checkbox"/> 450413843821834720184443000040	Database	db_test	2023-07-14 10:4 2:30	2023-07-14 10:4 2:31	200.89 KB	SQL	Successful	1 second	10000	100%		Details Download
<input type="checkbox"/> 8020277084400010842040807000	Quick Export	db_test	2023-07-14 10:3 8:20	2023-07-14 10:3 8:21	1.61 MB	SQL	Successful	1 second	100000	100%		Details Download

----End

Downloading Data Files


Data exported using the data export function is stored in the OBS bucket you created. You can download exported data files in any of the following ways:

- Download on the DAS Console.
- Download on the OBS management console.

Quick Export (Not Promoted)

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

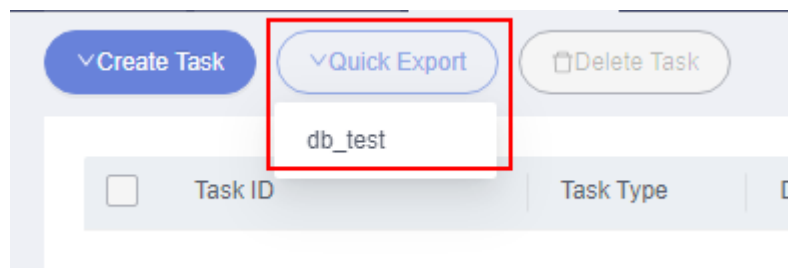
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

Step 7 In the upper left corner of the page, click **Quick Export** and select the database that you want to export data from.

Figure 7-38 Quick export

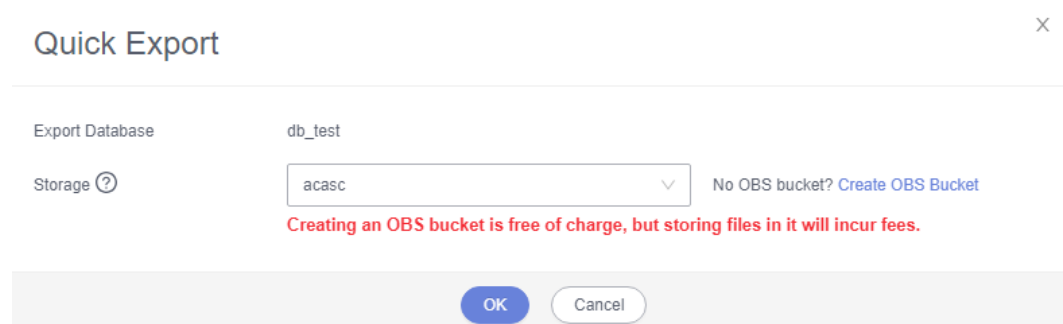


NOTE

A maximum of 200,000 rows can be quickly exported from a single table. To export more data, choose **Create Task > Export Database**.

Step 8 On the **Quick Export** page, select a storage path and click **OK**.

Figure 7-39 Quick export



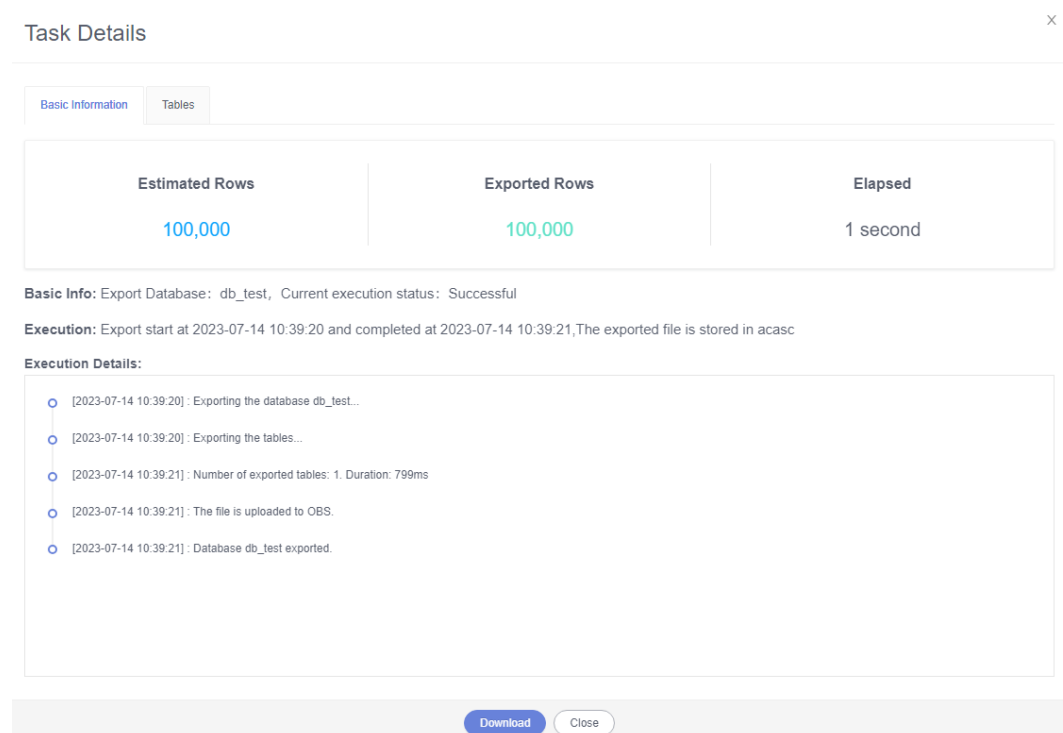
Step 9 In the task list, view the export task you created.

Figure 7-40 Task list

Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
e40237788446d16942646a775c7	Quick Export	db_test	2023-07-14 10:39:20	2023-07-14 10:39:21	1.61 MB	SQL	Successful	1 second	100000	100%		Details Download

In the row that contains the export task, you can click **Details** in the **Operation** column to view execution details of the task and information about exported tables.

Figure 7-41 Task details



----End

7.10 Intelligent O&M

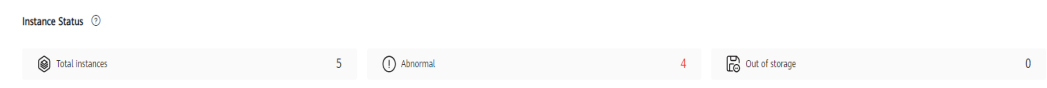
7.10.1 Dashboard

Dashboard helps you get knowledge of overall information about your instances, including instances by status, engine distribution, active alarms, slow query logs, monitoring dashboard, and resource risky instances. Intelligent Diagnosis checks instance health using instance operation data and intelligent algorithms and provides diagnosis results and suggestions.

Viewing the Instance Status

You can view the number of instances by status in the current region, including primary instances and read replicas.

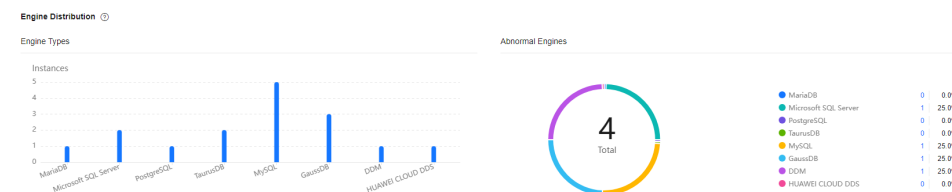
Figure 7-42 Instance status



Viewing Engine Distribution

You can view the distribution of engines in the current region, including engine types and abnormal engines.

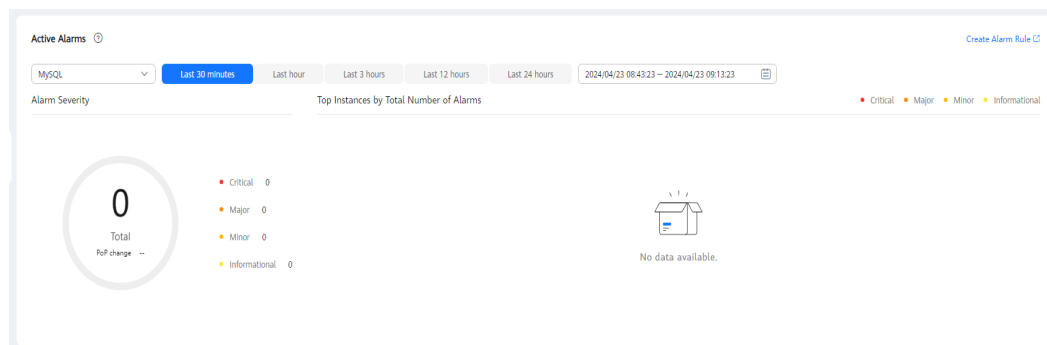
Figure 7-43 Engine distribution



Querying Active Alarms

You can view active alarms of all instances in the current region, including alarms in the Alarm (metric) and Triggered (event) statuses.

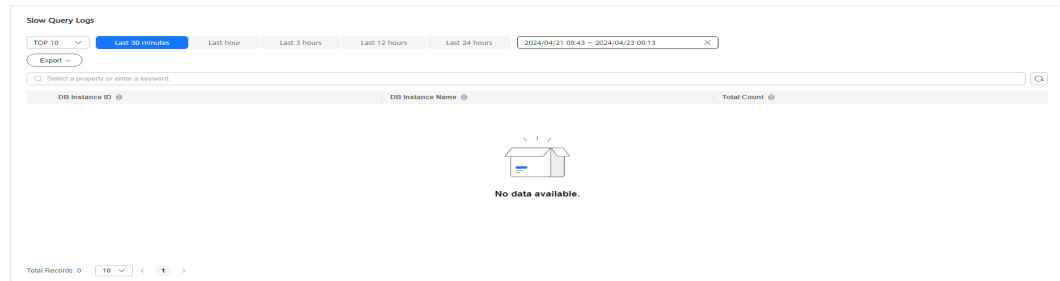
Figure 7-44 Active alarms



Viewing Slow Query Logs

You can view the number of slow query logs of all instances in the current region.

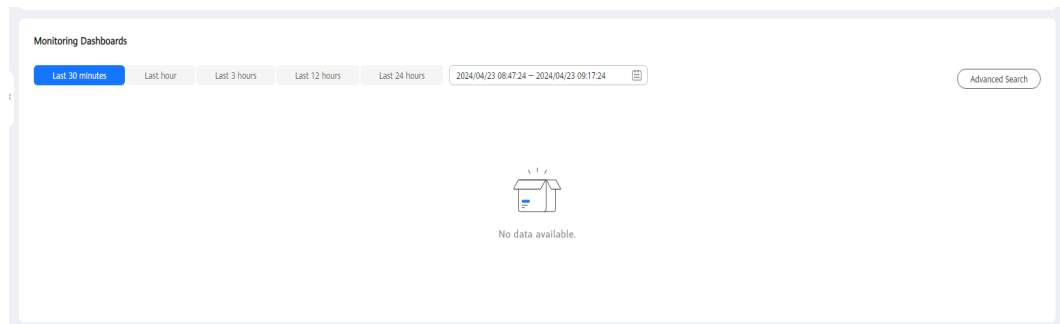
Figure 7-45 Slow query logs



Monitoring Dashboards

You can view metrics of all instances in the current region.

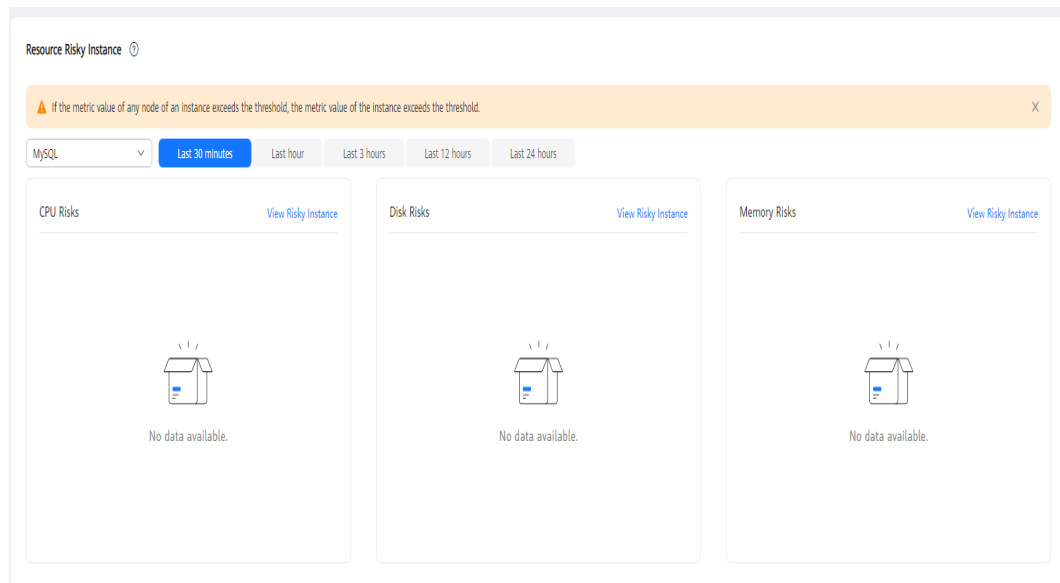
Figure 7-46 Monitoring dashboards



Viewing Resource Risky Instances

You can view metric risks of all instances in the current region.

Figure 7-47 Resource risky instances



7.10.2 Setting an Instance as Paid

Intelligent O&M is available for paid and free instances. Paid instances can enjoy more value-added functions.

For details about instance billing policies, see [Intelligent O&M Billing](#).

If you want to set an instance as paid, go to [Setting an Instance as Paid](#).


If you want to set more than one instance as paid, go to [Setting Instances as Paid](#).

If you want to set your instances as free instances, see [Setting a Paid Instance as Free](#).

Setting an Instance as Paid

Step 1 [Log in to the Huawei Cloud console](#).

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

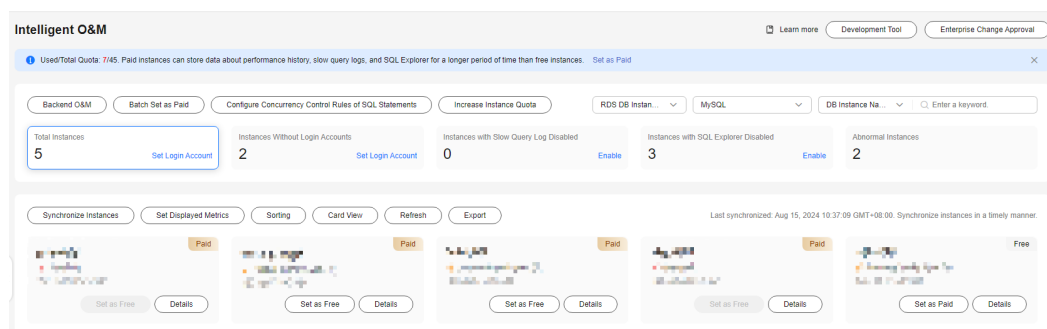
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 7-48 Searching for instances



Step 6 Select the instance that you want to set as paid and click **Set as Paid**.



Step 7 Carefully read the information displayed in the dialog box and click **OK**.

Step 8 On the **Instance List** page, check whether the instance status changes to **Paid**.

----End

Setting Instances as Paid

Step 1 [Log in to the Huawei Cloud console](#).

- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** On the displayed page, click **Batch Set as Paid** or **Set as Paid**.
- Step 6** Carefully read the information displayed in the dialog box, select the instances that you want to set as paid, and click **OK**.
- Step 7** On the **Instance List** page, check whether the instance status changes to **Paid**.
- End

Setting a Paid Instance as Free



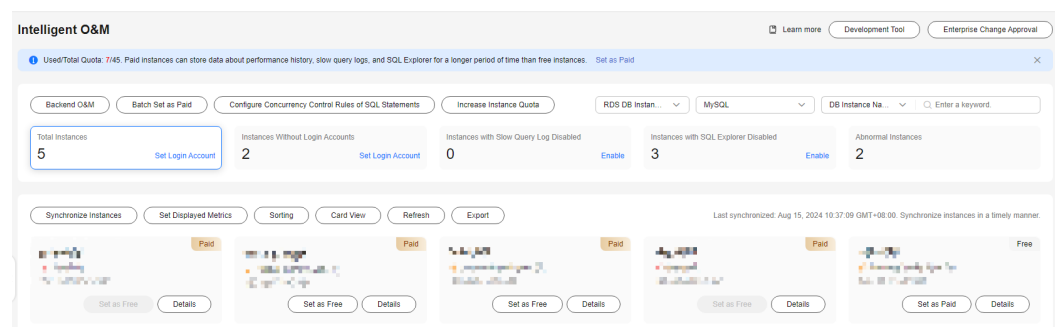
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 7-49 Searching for instances



- Step 6** Locate the instance that you want to set as free and click **Set as Free** on the **Instance Overview** page.
- Step 7** Carefully read the information displayed in the dialog box and click **OK**.
- If an instance is set as paid, you have to wait 5 minutes before it can be changed back to free.
 - On the **Instance List** page, check whether the instance status changes to **Free**.
- End

7.10.3 Performance

7.10.3.1 Instance Performance


The **Instance Performance** page displays key metrics of your instance and provides metric comparison between different days. You can keep track of metric changes and detect exceptions in a timely manner.

DAS Intelligent O&M displays metrics of an instance, such as disk usage, load, and kernel resource.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

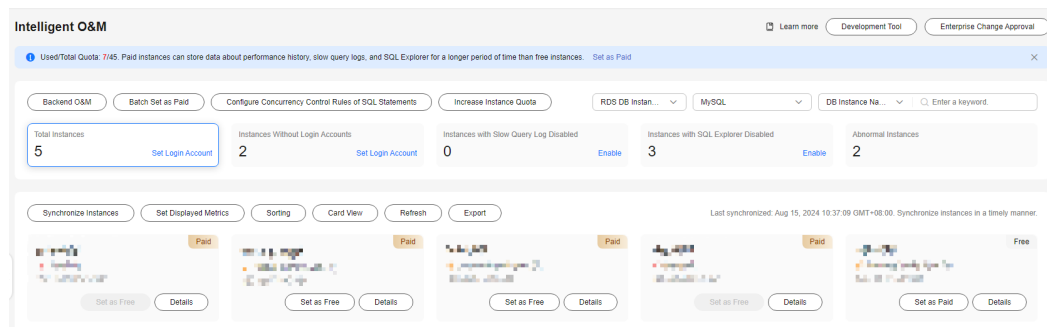
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 7-50 Searching for instances



Step 6 Select the target instance and click **Details**.

Step 7 Choose **Performance > Instance Performance > Performance History**.

Step 8 Click **Select Metric**, select the instance metrics to display, and click **OK**.

Table 7-5 Instance metrics

Category	Metric	Description
Disk Usage	Instance Disk Used Space	Real-time used space of data disks on the monitored instance (Unit: GB)

Category	Metric	Description
	Instance Disk Total Space	Real-time total space of data disks on the monitored instance (Unit: GB)
	Instance Disk Usage	Real-time data disk usage on the monitored instance (Unit: %)
Load	Deadlocks	Incremental number of database transaction deadlocks (Unit: count)
	Response Time of 80% SQL Statements	Real-time response time of 80% of database SQL statements (Unit: μ s)
	Response Time of 95% SQL Statements	Real-time response time of 95% of database SQL statements (Unit: μ s)
Kernel Resource	Buffer Hit Rate	Buffer hit rate of the database (Unit: %)

You can also perform the following operations:

- Click **Performance History** and specify a time range in the upper right corner to view metric details in the last 1 hour, 12 hours, 1 day, 2 days, or 7 days. You can also select a metric, click **Details** in the upper right corner of the graph, and specify a time range in the upper right corner to view metric details in the last 1 hour, 12 hours, 1 day, 2 days, or 7 days.

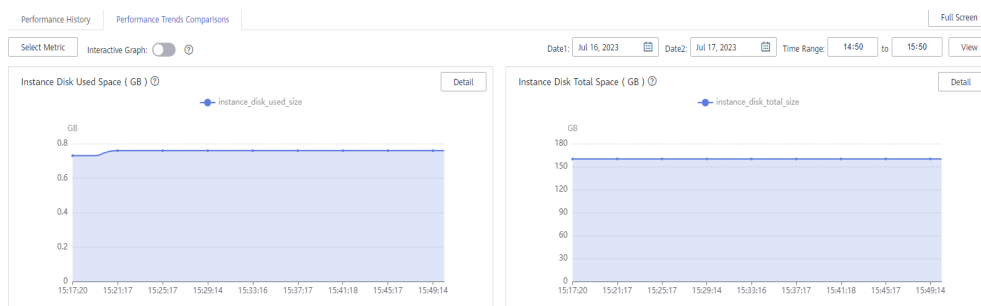
Figure 7-51 Querying metric details



- Click the **Performance Trends Comparisons** tab, select the metrics you want to view, and click **OK**.

You can also select the comparison time in the upper right corner of the **Performance Trends Comparisons** tab page.

Figure 7-52 Viewing performance trends comparisons



- Enable **Interactive Graph** to view other metrics.
- Click **Full Screen** for a clear view.

----End

7.10.3.2 Single Node with Multiple Metrics

The **Single Node with Multiple Metrics** tab displays key metrics of your node and provides metric comparison between different days. You can keep track of metric changes and detect exceptions in a timely manner.

You can view multiple metrics of a single instance and compare them with metrics of other instances.

Procedure



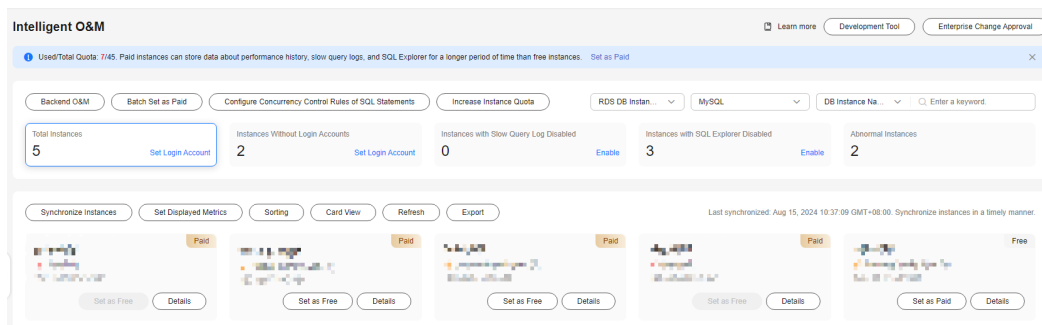
- Step 1** Log in to the Huawei Cloud console.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M** > **Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 7-53 Searching for instances



- Step 6** Locate the target instance and click **Details**.

Step 7 Choose **Performance > Single Node with Multiple Metrics**.

Step 8 Click **Change Node** to change the instance node if needed.

Step 9 Click **Select Metric**, select the node metrics to display, and click **OK**.

Table 7-6 Node metrics

Category	Metric	Description
CPU	CPU Usage	CPU usage of the monitored object (Unit: %)
	CPU Load	Average CPU load over the past 1, 5, and 15 minutes. The value is obtained using the w command.
	CPU Load in Past 1 Minute	Average CPU load over the past 1 minute. The value is obtained using the w command.
Memory	Memory Usage	Memory usage of the monitored object (Unit: %)
	Available Memory	Memory available to the operating system (Unit: GB)
Network	Data Transfer In	Average number of bytes sent by the VM of the monitored object in a measurement period (Unit: KB/s)
	Data Transfer Out	Average number of bytes received by the VM of the monitored object in a measurement period (Unit: KB/s)
Disk Usage	System Disk Usage	Real-time larger value between usages of disks / and /var/log on the monitored node (Unit: %)
	Used Disk Space	Real-time data disk usage of the monitored node. For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: GB)

Category	Metric	Description
	Total Disk Space	Real-time total data disk size of the monitored node. For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: GB)
	Disk Usage	Real-time data disk usage on the monitored instance For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: %)
	Log Disk Used Space	Used space of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: GB)
	Log Disk Total Space	Total space of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: GB)
	Log Disk Usage	Usage of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: %)
	ETCD Disk Usage	Usage of disk in /var/chroot/usr/local/etcd on the current node. This metric is available only for GaussDB Centralized.
	Total swap space, which can be queried via the free -m command	Total swap space, which can be queried via the free -m command
	Swap usage, which can be queried via the free -m command	Swap usage, which can be queried via the free -m command
	Inode usage, which can be queried via the df -i command	Inode usage, which can be queried via the df -i command

Category	Metric	Description
I/O	Disk IOPS	Real-time value of data disk reads and writes per second of the monitored node For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: Count/s)
	Log Disk IOPS	IOPS of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: Count/s)
	Disk Write Throughput	Real-time write throughput per second of the data disk on the monitored node For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: KB/s)
	Disk Read Throughput	Real-time read throughput per second of the data disk on the monitored node For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: KB/s)
	Log Disk Write Throughput	Write throughput of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: KB/s)
	Log Disk Read Throughput	Read throughput of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: KB/s)

Category	Metric	Description
	Time Required for per Disk Write	Average time required for a data disk write on the monitored node For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: ms)
	Time Required for per Disk Read	Average time required for a data disk read on the monitored node For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: ms)
	Max. Log Disk Seconds per Write	Seconds per write of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: ms)
	Max. Log Disk Seconds per Read	Seconds per read of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: ms)
Process Status	om_agent Status	Whether the om_agent process exists on the current node
	om_monitor Status	Whether the om_monitor process exists on the current node
	dbmanager Status	Whether the dbmanager process exists on the current node
	watchdog Status	Whether the watchdog process exists on the current node
	agentmonitor Status	Whether the agentmonitor process exists on the current node
Semaphore	Semaphore format. <code>lpcs -s wc -1</code>	Semaphore format. <code>lpcs -s wc -1</code>
Password	Password Expiration Time	Password expiration time for accounts Ruby and root .

You can also perform the following operations:

- Click **Performance History** and specify a time range in the upper right corner to view metric details in the last 1 hour, 12 hours, 1 day, 2 days, or 7 days.
You can also select a metric, click **Details** in the upper right corner of the graph, and specify a time range in the upper right corner to view metric details in the last 1 hour, 12 hours, 1 day, 2 days, or 7 days.
- Click the **Performance Trends Comparisons** tab, select the metrics you want to view, and click **OK**.
You can also select the comparison time in the upper right corner of the **Performance Trends Comparisons** tab page.
- Enable **Interactive Graph** to view other metrics.
- Click **Full Screen** for a clear view.

----End


7.10.3.3 Multiple Nodes with a Single Metric

This function allows you to view the same metric of multiple instances so that you can compare performance of different instances at a specific point of time.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

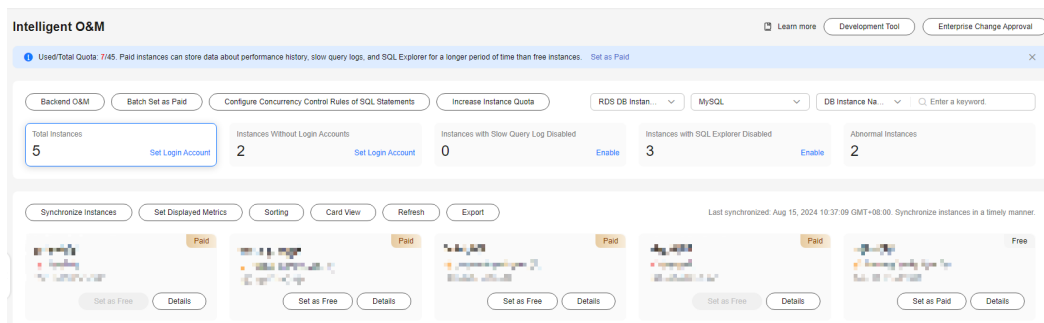
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 7-54 Searching for instances



Step 6 Select the instance whose metrics you want to view and click **Details**.

Step 7 Choose **Performance > Multiple Nodes with Single Metric**.

Step 8 Click **Select Node** to select instances.

 NOTE

You can select a maximum of five nodes of the same type.

Step 9 Click **Select Metric** and select the instance metrics to display.

Table 7-7 Node metrics

Category	Metric	Description
CPU	CPU Usage	CPU usage of the monitored object (Unit: %)
	CPU Load	Average CPU load over the past 1, 5, and 15 minutes. The value is obtained using the w command.
	CPU Load in Past 1 Minute	Average CPU load over the past 1 minute. The value is obtained using the w command.
Memory	Memory Usage	Memory usage of the monitored object (Unit: %)
	Available Memory	Memory available to the operating system (Unit: GB)
Network	Data Transfer In	Average number of bytes sent by the VM of the monitored object in a measurement period (Unit: KB/s)
	Data Transfer Out	Average number of bytes received by the VM of the monitored object in a measurement period (Unit: KB/s)
Disk Usage	System Disk Usage	Real-time larger value between usages of disks / and /var/log on the monitored node (Unit: %)
	Used Disk Space	Real-time data disk usage of the monitored node. For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: GB)

Category	Metric	Description
	Total Disk Space	Real-time total data disk size of the monitored node. For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: GB)
	Disk Usage	Real-time data disk usage on the monitored instance For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: %)
	Log Disk Used Space	Used space of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: GB)
	Log Disk Total Space	Total space of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: GB)
	Log Disk Usage	Usage of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: %)
	ETCD Disk Usage	Usage of disk in /var/chroot/usr/local/etcd on the current node. This metric is available only for GaussDB Centralized.
	Total swap space, which can be queried via the free -m command	Total swap space, which can be queried via the free -m command
	Swap usage, which can be queried via the free -m command	Swap usage, which can be queried via the free -m command
	Inode usage, which can be queried via the df -i command	Inode usage, which can be queried via the df -i command

Category	Metric	Description
I/O	Disk IOPS	Real-time value of data disk reads and writes per second of the monitored node For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: Count/s)
	Log Disk IOPS	IOPS of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: Count/s)
	Disk Write Throughput	Real-time write throughput per second of the data disk on the monitored node For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: KB/s)
	Disk Read Throughput	Real-time read throughput per second of the data disk on the monitored node For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: KB/s)
	Log Disk Write Throughput	Write throughput of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: KB/s)
	Log Disk Read Throughput	Read throughput of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: KB/s)

Category	Metric	Description
	Time Required for per Disk Write	Average time required for a data disk write on the monitored node For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: ms)
	Time Required for per Disk Read	Average time required for a data disk read on the monitored node For GaussDB Distributed, the disk in /var/chroot/var/lib/engine/data of data nodes is monitored, and the disk in /var/chroot/usr/local of other nodes is monitored. For GaussDB Centralized, only data disks of data nodes are monitored. (Unit: ms)
	Max. Log Disk Seconds per Write	Seconds per write of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: ms)
	Max. Log Disk Seconds per Read	Seconds per read of the disk in /var/chroot/var/lib/log of a monitored node. This metric will be updated in real time only for GaussDB Distributed. (Unit: ms)
Process Status	om_agent Status	Whether the om_agent process exists on the current node
	om_monitor Status	Whether the om_monitor process exists on the current node
	dbmanager Status	Whether the dbmanager process exists on the current node
	watchdog Status	Whether the watchdog process exists on the current node
	agentmonitor Status	Whether the agentmonitor process exists on the current node
Semaphore	Semaphore format. <code>lpcs -s wc -1</code>	Semaphore format. <code>lpcs -s wc -1</code>
Password	Password Expiration Time	Password expiration time for accounts Ruby and root .

You can also perform the following operations:

- Click **Performance History** and specify a time range in the upper right corner to view metric details in the last 1 hour, 12 hours, 1 day, 2 days, or 7 days.
You can also select a metric, click **Details** in the upper right corner of the graph, and specify a time range in the upper right corner to view metric details in the last 1 hour, 12 hours, 1 day, 2 days, or 7 days.
- Click the **Performance Trends Comparisons** tab, select the metrics you want to view, and click **OK**.
You can also select the comparison time in the upper right corner of the **Performance Trends Comparisons** tab page.
- Enable **Interactive Graph** to view other metrics.
- Click **Full Screen** for a clear view.

----End

7.10.4 Real-Time sessions

The real-time session function allows you to query session snapshots of your instance and can sort out and display only the required snapshots. You can quickly search for slow or active sessions in multiple dimensions like users, host IP addresses, and database names. DAS allows you to kill sessions to restore your instance, securing your database availability.

Usage Notes

Killing a session may cause instance or service exceptions.

Procedure



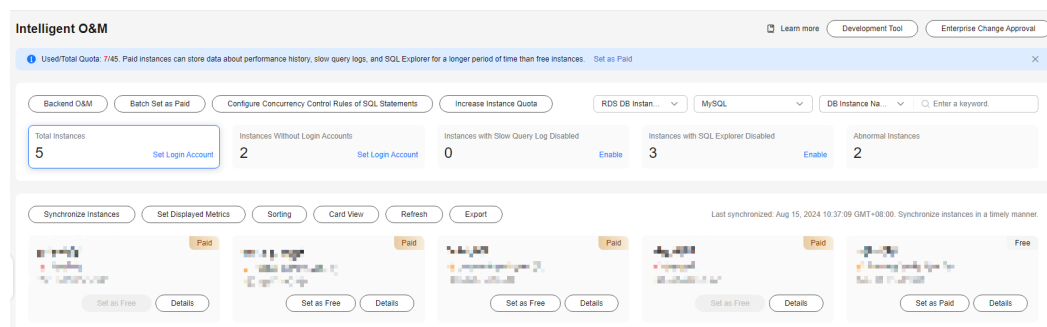
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M** > **Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 7-55 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 Choose **Sessions > Real-Time Sessions**.

- On the **Real-Time Sessions** tab, you can view session statistics of the instance by user, host, and database.
- Select the abnormal session you want to end and click **Kill** for your database to recover.
- On the **Slow Sessions** tab page, specify **Slow Session Threshold** and click the refreshing button or enable **Auto Refresh** to search for the SQL statements whose execution time exceeds the threshold.

----End

7.10.5 SQL

7.10.5.1 Slow Query Logs

This section describes how to analyze slow query logs in a specified period. Slow Query Log displays a chart of SQL statements that are taking too long to execute and allows you to sort slow SQL statements by multiple dimensions, such as by user, host, or SQL template. It helps you quickly identify bottlenecks and improve instance performance.


Usage Notes

- To use the slow query log function, you need to toggle on **Collect Slow Query Logs**. Then DAS will store slow query logs for analysis.
- Slow query logs of free instances are retained for only one hour while those of paid instances are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.
- You can enable the slow query logs function for a maximum of 10 free instances. There is no such a limit on paid instances.
- For free instances, you can only view slow query logs generated in the latest hour.

Viewing slow query logs

Step 1 [Log in to the Huawei Cloud console](#).

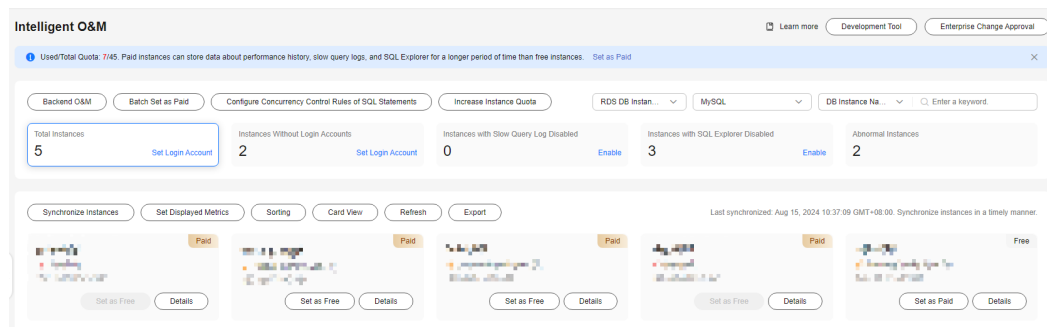
Step 2 Click  in the upper left corner and select a region and project.

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 7-56 Searching for instances

Step 6 Locate the target instance and click **Details**.

Step 7 In the upper right corner of the page, click **Go to Old Edition**.

Step 8 Choose **SQL > Slow Query Logs**.

Step 9 Select a time range and view trends, statistics, and details of the slow query logs generated within the time range.

- Log trends

In the trends graph, you can hover your mouse at any point in time to view slow query logs or CPU usage.

Above the chart, you can switch to another instance or node to view slow queries by instance or by node.

- Details

View slow query log details in the lower part of the **Slow Query Logs** area. The details include the SQL statement, execution time, database name, client, user, execution duration, lock wait duration, and scanned and returned rows.

Click **Export** to export slow query log details to a specific OBS bucket. After the details are exported, you can click **Export History** to view export records. You can also download the details to your local PC.

NOTE

This function is available to only paid instances.

Locate the SQL template you want to diagnose and click **Diagnose** in the **Operation** column.

- Slow query log statistics

Click **Sample** in the **Operation** column to view the sample of the SQL statement template.

On the **Statistics** page, click **Export** to export slow query logs to a specific OBS bucket. Then you can click **Export History** to view export records. You can also download the exported slow query logs to your local PC.

NOTE

This function is available to only paid instances.

----End

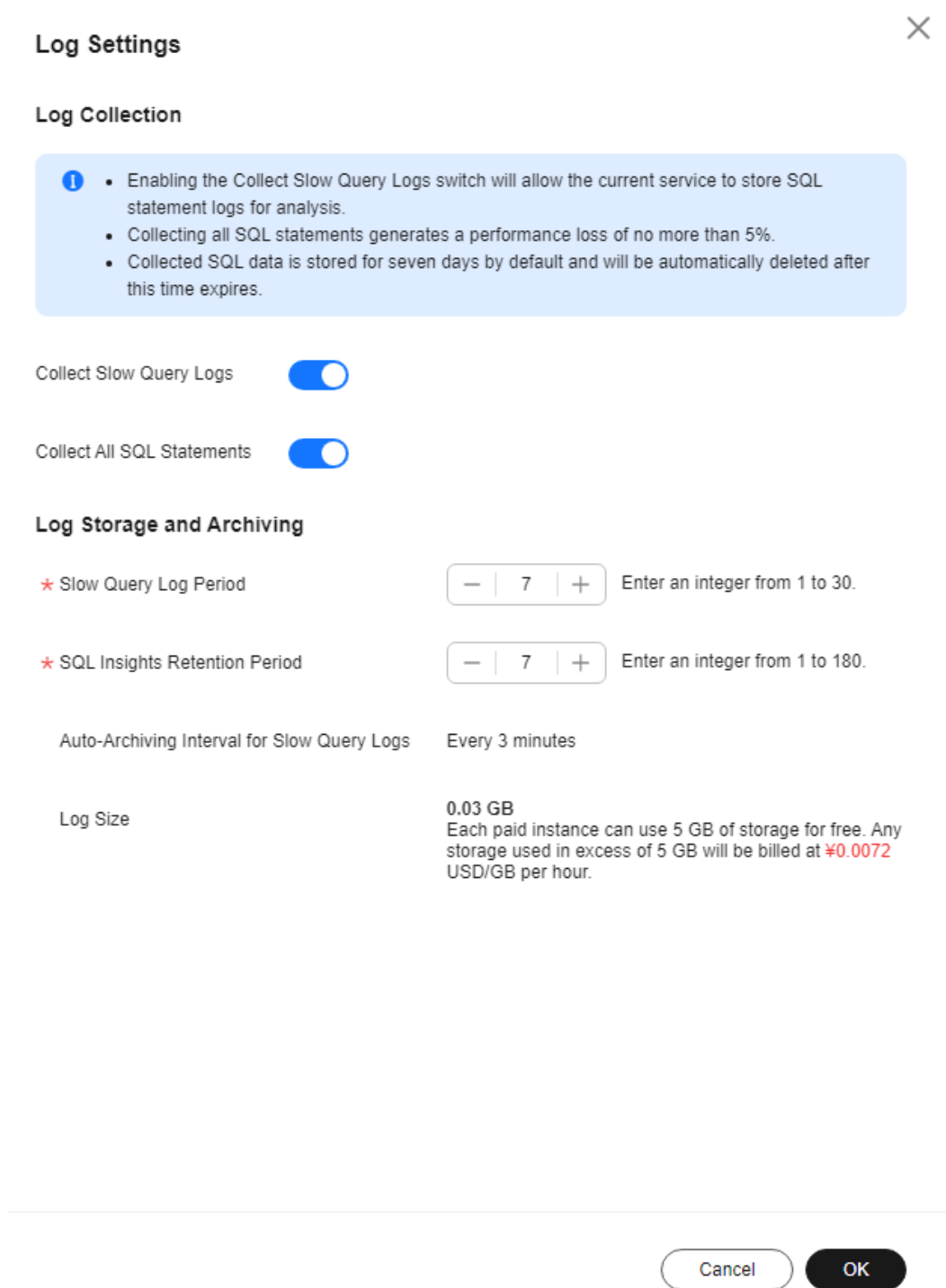
Slow Query Log Storage

After **Collect Slow Query Logs** is enabled, SQL text content will be stored in OBS for analysis.

Slow query logs of free instances are retained for only one hour while those of paid instances are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.

For paid instances, you can click **Log Settings** to set the storage duration on the **Slow Query Logs** tab page.

Figure 7-57 Setting storage duration for slow query logs



Each paid instance can use 5 GB of storage for slow query logs for free. Any storage used in excess of 5 GB will be billed on a pay-per-use basis.

Deleting Slow Query Logs

On the **Slow Query Logs** tab page, you can click **Delete All** or **Delete** to delete all slow query logs or some slow query logs generated in a specific period.

 NOTE

Deleted slow query logs cannot be recovered. Exercise caution when performing this operation.

7.10.5.2 SQL Explorer

After **Collect All SQL Statements** is enabled, you can gain a comprehensive insight into SQL statements on the **SQL Explorer** page. Top SQL helps you locate exceptions.

SQL Explorer can record all SQL statements executed on your instance and enables you to analyze and search for the tables that are accessed and updated the most frequently and the SQL statements that have the longest lock wait.


Usage Notes

- After **Collect All SQL Statements** is disabled, new SQL statements will not be collected and the collected SQL statements will be deleted.
- Logs of all SQL statements executed on free instances can be retained for only one hour while those for paid instances can be retained for seven days by default and for up to 30 days as a maximum. After the retention period expires, the logs are deleted automatically.

Execution Duration Distribution of Top SQL Templates

Step 1 [Log in to the Huawei Cloud console](#).

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

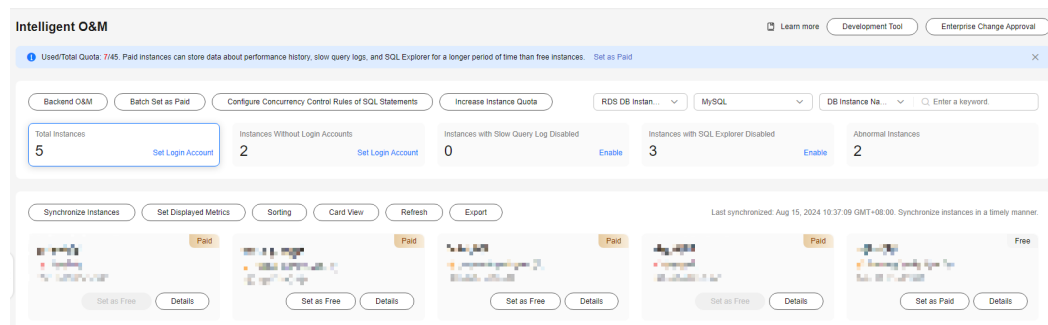
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 7-58 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL > SQL Explorer**.

Step 8 Toggle on **Collect All SQL Statements** to obtain information about all SQL statements executed on the current instance.

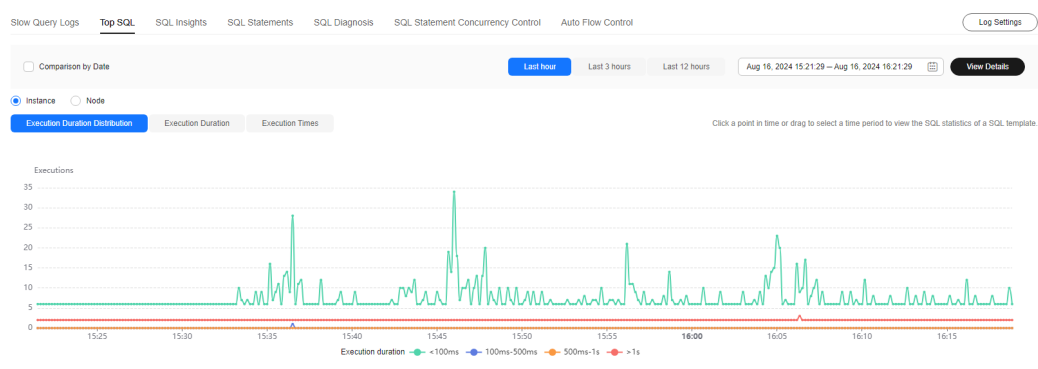
 **NOTE**

Collect All SQL Statements takes effect once it is enabled.

Step 9 On the **Top SQL** tab page, view execution duration of top SQL statements.

You can select **Last hour**, **Last 3 hours**, or **Last 6 hours** to view execution durations of top SQL statements. You can also set a time range that spans no more than one day.

Figure 7-59 Top SQL



The Execution Duration Distribution graph shows how many times SQL statements with different elapsed time lengths are executed over a specified time range. DAS collects SQL statistics of four elapsed time lengths.

- < 100 ms: number of SQL statement executions whose elapsed time is less than 100 ms
- 100 ms–500 ms: number of SQL statement executions whose elapsed time ranges from 100 ms to 500 ms
- 500 ms–1s: number of SQL statement executions whose elapsed time ranges from 500 ms to 1s
- > 1s: number of SQL statement executions whose elapsed time is longer than 1s

SQL statistics in the four elapsed time lengths are collected over the time range you specified.

- If you select **Last hour**, SQL statement executions are calculated every 10 seconds.
- If you select **Last 6 hours**, SQL statement executions are calculated every minute.
- If you select a time range longer than 6 hours, SQL statement executions are calculated every 5 minutes.

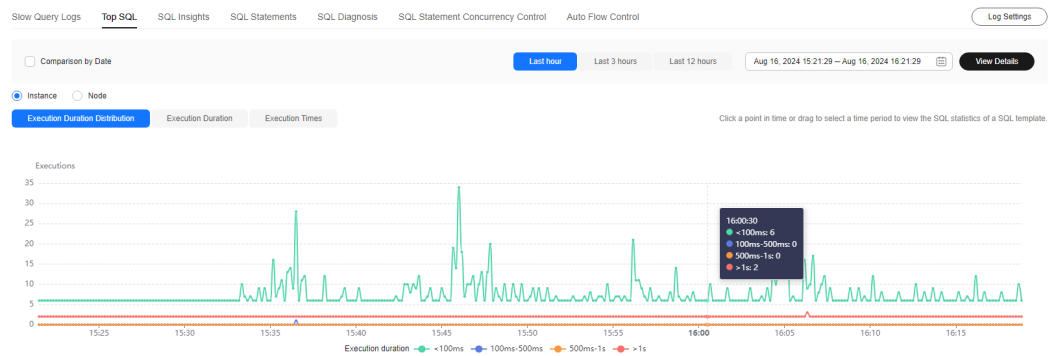
Select **By instance** or **By node** to view execution duration distribution. You can change node to view its execution duration distribution. The primary node is

selected by default. If you want to view the execution duration distribution of other nodes, click **Change Node**.

Step 10 In the SQL template list, view execution duration details, such as average execution duration, total duration, average lock wait duration, and average scanned rows.

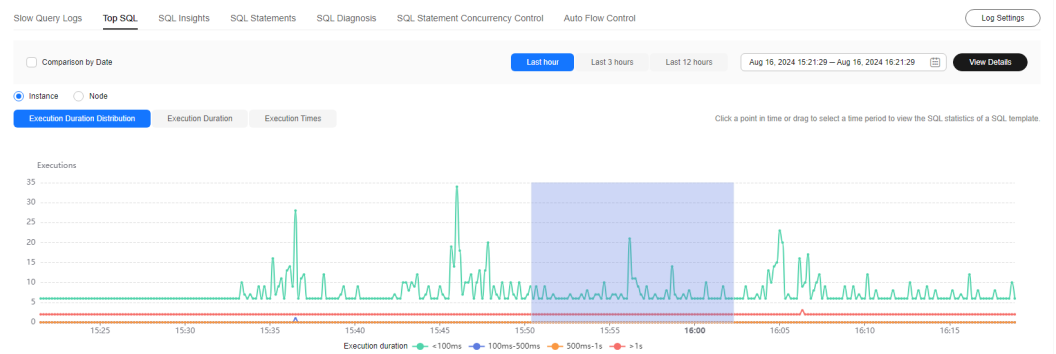
- Hover your mouse at any point in time on the graph to view top SQL statements at that time.

Figure 7-60 Viewing top SQL statements at a specific point in time



- Specify a time range using your mouse on the graph, and you will see top SQL statements during that time range.

Figure 7-61 Viewing top SQL statements in a specified time range




- Click **Export** to export details about all top SQL templates in the list. This function is available only to paid instances.
- In the SQL template list, locate a SQL template and click **Details** to view the total execution times, average rows scanned, average execution duration, and the like.

----End

SQL Audit

Step 1 [Log in to the Huawei Cloud console.](#)

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

- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** On the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** Locate the target instance and click **Details**.
- Step 6** Choose **SQL > SQL Explorer**.
- Step 7** Click the **SQL Audit** tab.
- Step 8** On the **SQL Audit** tab page, view SQL audit tasks.
- Specify the start time, end time, task creation time, and node information to search for SQL audit tasks.
 - Click **Add SQL Audit Task** and specify a time range to add a task. You can add an instance- or node-level task based on your service requirements. The added SQL audit task is displayed in the list below.
 - Click **Details** in the **Operation** column to view task details. You can specify filters such as **Time Range**, **User**, **Keyword**, or **Database** and click **Query** to search for the SQL statements executed on the current instance. The selected time range must be after the time when the SQL audit task is added.

----End

7.10.6 Daily Reports

The **Daily Reports** page provides overall information about your instance status of the previous day, including Slow Query Logs, SQL Explorer, performance, and disk analysis. You can download and subscribe to analysis reports. A daily diagnosis is recommended.

Procedure



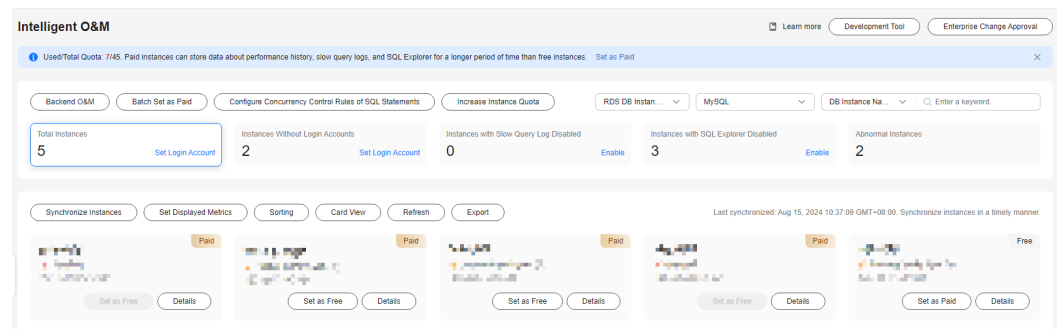
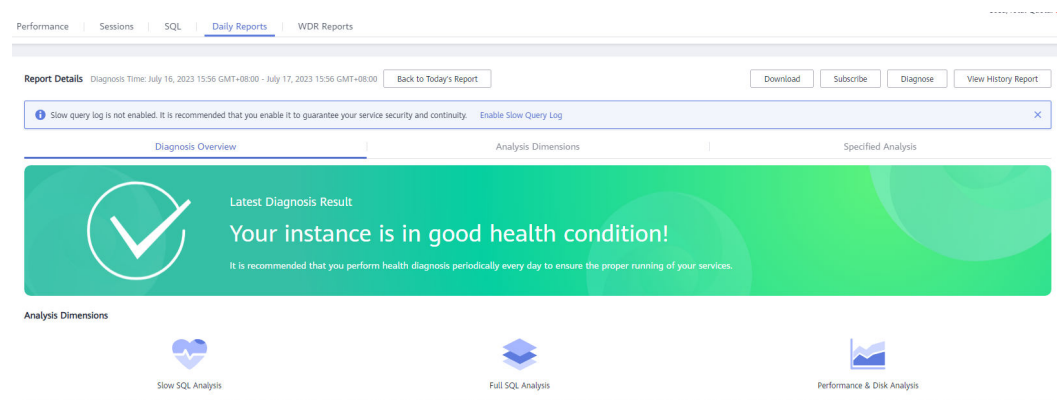
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 7-62 Searching for instances

Step 6 Locate the target instance and click **Details**.

Step 7 On the top menu bar, choose **Daily Reports**.



You can perform the following operations:

- Click **Download** to download a diagnosis report to your local PC.
- Click **Subscribe** and enter your email to have the diagnosis report emailed to you.

NOTE

Before subscribing to diagnosis reports, note that:

- The subscription function depends on the Simple Message Notification (SMN) service.
- After you subscribe to daily reports, diagnosis reports will be emailed to you after you manually diagnose your instance and the result is abnormal.
- Click **Diagnose** to diagnose the current instance.
- Click **View History Report** to view historical diagnosis reports.
- On the **Diagnosis Overview** page, view diagnosis results of the instance.
- On the **Analysis Dimensions** page, view diagnosis dimensions, including Slow SQL Analysis, Full SQL Analysis, and Performance & Disk Analysis.
- On the **Specified Analysis** page, view details in a report, including slow SQL analysis, full SQL analysis, and performance and disk analysis.

----End


7.10.7 WDR Reports

WDR is the main method for diagnosing long-term performance problems. Based on the performance baseline of a snapshot, performance analysis is performed from multiple dimensions to diagnose database kernel performance faults, helping DBAs understand the system load, performance of each component, and performance bottlenecks.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

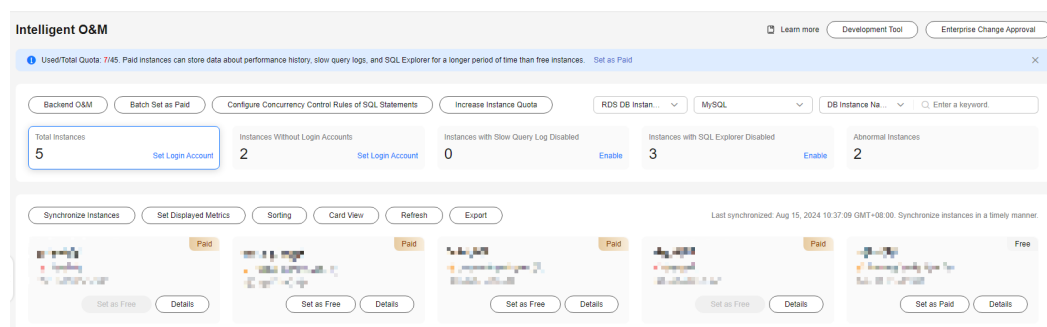
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 7-63 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 Click **WDR Reports**. You can generate WDR reports by instance or by node.

Step 8 On the **Instance Reports** or **Node Reports** tab page, specify the **Start Snapshot** time and **End Snapshot** time, and click **Generate Report**.

NOTE

Ensure that the following operations do not happen between two snapshots:

- No nodes are restarted between two snapshots.
- No primary/standby switchovers are performed between two snapshots.
- No databases are deleted between two snapshots.

Step 9 Wait until the report is generated and click **Download Report** to download the report to the local PC.

----End



8.1 Account Management

8.1.1 Creating a User

Multiple users with different permissions can be created to access a DB instance or database, but the permissions of these users must be within a certain range.

Hidden Accounts

DAS can hide your TaurusDB instance accounts to ensure that your database runs normally and to prevent your account details from being deleted by mistake.

Table 8-1 Accounts that DAS can hide

Account	Description
mysql.session@localhost	Internal database account configured in TaurusDB 5.7 or later.
mysql.sys@localhost	Internal database account configured in TaurusDB 5.7 or later.
mysql.infoschema@localhost	Internal database account.
root@%	Account configured when you create a TaurusDB instance.
rdsAdmin@localhost	Management account, which has the highest permission and is used to query and modify instance information, rectify faults, as well as migrate and restore data.
rdsBackup@localhost	Backup account, which is used for backend backup.
rdsMetric	Metering account, which is used by watchdog to collect database status data.

Account	Description
rdsRepl	Replication account, which is used to synchronize data from primary instances to standby instances or read replicas.
rdsProxy	Proxy account, which is used for authentication when a database is connected using a read/write splitting address. This account is automatically created when read/write splitting is enabled.
drsFull	Account added to the destination database when you start a full migration task on DRS.
drsIncremental	Account added to the destination database when you start an incremental migration task on DRS.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > User Management**.
- Step 7** Click **Create User**.

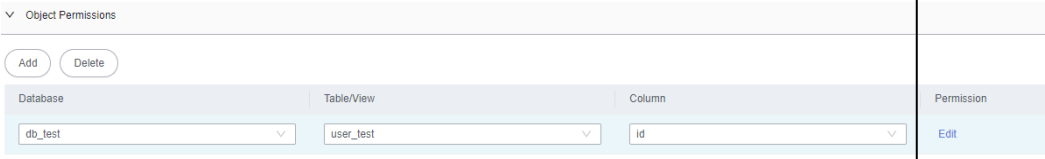
Figure 8-1 Creating a user

Configure required details, such as basic information, advanced settings, global permissions, object permissions, and roles by referring to [Table 8-2](#).

Table 8-2 Parameter description

Type	Parameter	Configuration Description
Basic Information	Username	Name of the new user.
	Host	<p>Whitelisted IP addresses allowed to access the database server.</p> <ul style="list-style-type: none"> If you leave this parameter blank or enter %, the user can access all IP addresses. If you enter multiple IP addresses, separate them with commas (.). For example, if you enter 192.%,193.% for Host, two users with host addresses of 192.% and 193.% will be created, respectively. You can click Add DAS IP Address to add a DAS server IP address to the user host.

Type	Parameter	Configuration Description
	Password	<p>Password of the user. The password:</p> <ul style="list-style-type: none"> • Can include 8 to 32 characters. • Contains at least three types of the following characters: lowercase letters, uppercase letters, digits, and special characters ~!@#%&^*-_+=?,&(). • Cannot be the username or the username spelled backwards. • Cannot be a weak password.
	Confirm Password	The value must be the same as the user password you set.
Advanced Settings	Max. Queries Per Hour	Maximum queries that this user can execute within an hour. If this parameter is left empty or set to 0 , there is no limit on the maximum queries.
	Max. Updates Per Hour	Maximum updates that this user can execute within an hour. If this parameter is left empty or set to 0 , there is no limit on the maximum updates.
	Max. Connections Per Hour	Maximum connections (of this user) to the DAS server within an hour. If this parameter is left empty or set to 0 , there is no limit on the maximum connections.
	Max. User Connections	Maximum concurrent connections to the server. If this parameter is left empty or set to 0 , there is no limit on the maximum concurrent connections.
	SSL Type	Type of certificates for authenticating user requests sent to the server.
	Issuer	Authority that issues X.509 certificates for connecting the user to the server.
	Subject	Subject of the X.509 certificates for connecting the user to the server.
	Algorithm	Method of encrypting connections between the user and the server.
Global Permissions	<p>Permissions granted to the user to perform operations on all databases in the current instance.</p> <p>For details about the global permissions that can be configured, see Table 8-3. For details about permission usages and explanations, visit the official website.</p>	

Type	Parameter	Configuration Description
Object Permissions		<p>Permissions granted to the user on specific objects.</p> <p>For details about the object permissions that can be configured, see Table 8-3. For details about permission usages and explanations, visit the official website.</p> <p>Example:</p> <p>The following settings grant the user the permission to query the ID of table user_test in database db_test.</p> <p>Figure 8-2 Adding an object permission</p>  <p>On the Object Permissions tab, you can add or delete object permissions and click Save. In the displayed dialog box, click OK.</p>

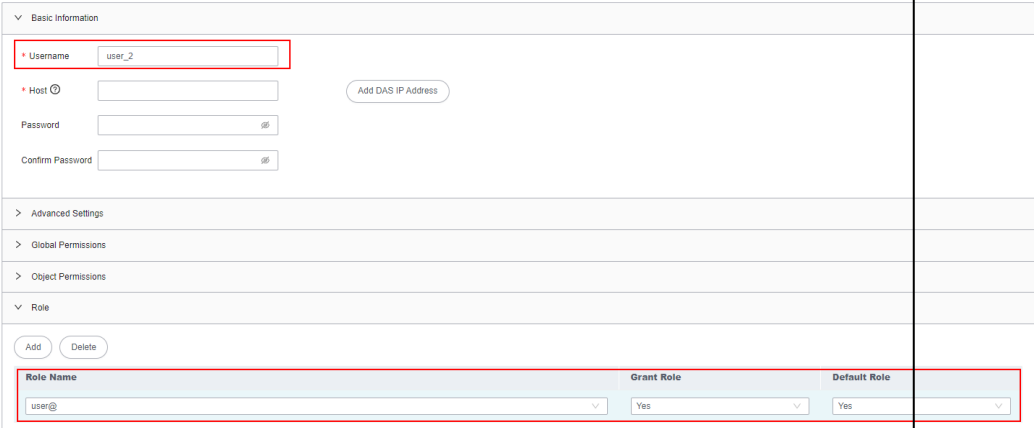
Type	Parameter	Configuration Description
Role		<p>Role of the user. Roles are only supported for MySQL 8.0.</p> <ul style="list-style-type: none"> • Role Name: You can select an existing username in this instance. • Grant Role: Whether the new user can grant permissions of the selected role to another user. • Default Role: Whether the new user can inherit permissions of the selected role. <p>NOTE To manage roles, the current account must have the ROLE_ADMIN permission. You can manually assign the permission. For example, you can run the GRANT ROLE_ADMIN on *.* TO 'root'@' %' command to assign the ROLE_ADMIN permission to user root.</p> <p>Example: The following settings indicate that user_2 can inherit permissions of user@ and can grant permissions of user@ to another user.</p> <p>Figure 8-3 Granting permissions</p>  <p>The screenshot shows a web interface for configuring a user. Under the 'Role' section, there are three dropdown menus: 'Role Name' (set to 'user@'), 'Grant Role' (set to 'Yes'), and 'Default Role' (set to 'Yes'). Red boxes highlight the 'Role Name' dropdown and the 'Grant Role' and 'Default Role' dropdowns.</p>

Table 8-3 Permission description

Permission	Description
SELECT	Permission to query a specified object, for example, a global or single database.
INSERT	Permission to insert data into a specified object.
UPDATE	Permission to update data of a specified object.
DELETE	Permission to delete data from a specified object.
CREATE	Permission to create databases and tables for a specified object.

Permission	Description
DROP	Permission to delete databases, tables, and views from a specified object.
RELOAD	Permission to execute FLUSH .
PROCESS	Permission to execute SHOW PROCESSLIST to view all the processes.
GRANT	Permission to grant a specified object the permissions of another account or reclaim permissions from other accounts.
REFERENCES	Permission to create foreign keys for a specified object.
INDEX	Permission to create or delete an index for a specified object.
ALTER	Permission to execute ALTER TABLE for a specified object.
SHOW DATABASES	Permission to run SHOW DATABASES to show all databases.
CREATE TEMPORARY TABLES	Permission to execute CREATE TEMPORARY TABLE for a specified object.
LOCK TABLES	Permission to execute LOCK TABLES on the tables with the SELECT permission for a specified object.
EXECUTE	Permission to execute a stored procedure for a specified object.
REPLICATION SLAVE	Permission to allow the replica server to read binary log events from the source server.
REPLICATION CLIENT	Permission to query locations of the source server or replica server.
CREATE VIEW	Permission to create or alter a view for a specified object.
SHOW VIEW	Permission to execute SHOW CREATE VIEW for a specified object.
CREATE ROUTINE	Permission to create a stored procedure for a specified object.
ALTER ROUTINE	Permission to alter or delete a stored procedure for a specified object.
CREATE USER	Permission to execute CREATE USER , DROP USER , RENAME USER , and REVOKE ALL PRIVILEGES for a specified object.
EVENT	Permission to create, modify, delete, or display the event scheduler for a specified object.

Permission	Description
TRIGGER	Permission to execute a trigger for a specified object. Only users with this permission can create, delete, execute, or display triggers of a table.

Step 8 After configuring required parameters, click **Save**. In the preview dialog box, click **OK**.

Step 9 After the user is created, check whether the user is displayed in the user list.

Figure 8-4 Viewing user information



----End

8.1.2 Editing a User

This section describes how to edit user information, including the user name, password, global permissions, object permissions, and advanced settings.


Usage Notes

Improper database user settings will cause instance or service exceptions.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Account Management > User Management**.

Step 7 In the user list, locate the user whose information you want to edit and click **Edit** in the **Operation** column.

Figure 8-5 Editing a user

The screenshot shows a web interface for editing a user. At the top, there are navigation tabs for 'Home' and 'User Management X'. Below the tabs is a breadcrumb trail: 'Back to User Management List / Edit User - test'. The main content area is a form titled 'Basic Information' with a dropdown arrow. It contains four input fields: 'Username' with the value 'test', 'Host' with a help icon, 'Password' masked with dots, and 'Confirm Password' masked with dots. Below the form are three expandable sections: 'Advanced Settings', 'Global Permissions', and 'Object Permissions'.

Step 8 On the displayed page, edit user information, set global and object permissions, and click **Save**. In the displayed dialog box, click **OK**.

----End



8.1.3 Deleting a user

This section describes how to drop a user that is no longer needed.

Precautions

Deleted users cannot be recovered. Exercise caution when performing this operation.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > User Management**.

Step 7 In the user list, locate the user that you want to delete and click **Delete** in the **Operation** column.

Figure 8-6 Deleting a user



Username	Host	Global Permissions	Object Permissions	Role	Operation
dmin		29	0	0	Edit Delete

Step 8 In the displayed dialog box, click **Yes**.

----End


8.2 Database Management

This section describes how to create or delete a database on the DAS console.

Creating a Database

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 Click **Create Database**.

Step 7 In the displayed dialog box, enter a database name, specify a character set, and click **OK**.

Figure 8-7 Creating a database

Create Database ✕

* Name ?

Only user databases can be created

Character Set ▼

Collation ▼

Step 8 View the created database in the database list and manage the database.

----End

Dropping a Database

If you do not need the database any longer, perform the following operations to delete it:

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 In the database list, locate the database you want to drop and choose **More >** **Drop** in the **Operation** column.

Figure 8-8 Database list

Database Name	Table Quantity	Table Size	Index Size	Character Set	Operation
db-test	--	--	--	utf8mb4	Manage Query SQL Statements Create Table Data Dictionary More Drop

15 / page Total Records: 1

Step 7 In the displayed dialog box, click **Yes**.

----End

8.3 SQL Operations

8.3.1 SQL Window

DAS allows you to easily run various SQL statements in graphical SQL windows and perform operations on the database, such as adding, deleting, editing, and viewing the database.

Introduction to the SQL Window

Figure 8-9 The SQL window

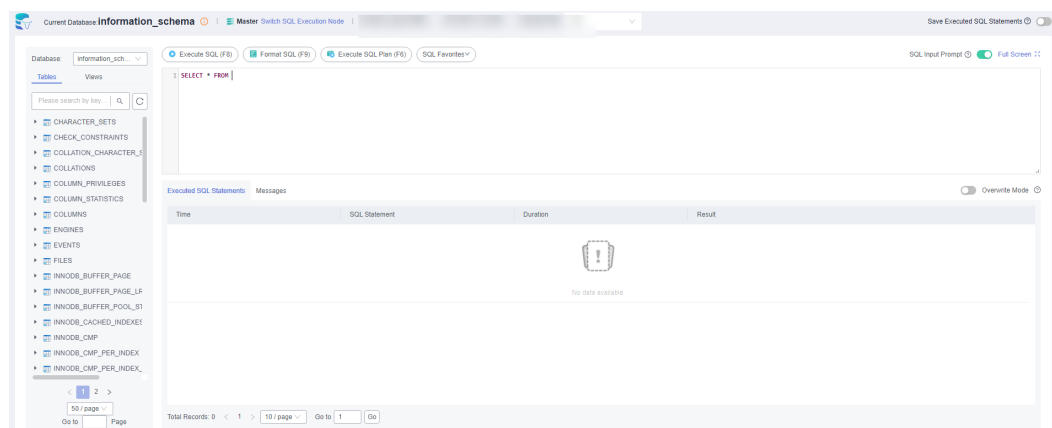


Table 8-4 Function description


Function	Description
Execute SQL	Executes SQL statements. SQL operations are performed on tables and views in a database.
Format SQL	Improves readability of SQL statements. Formatting SQL statements enables statements to be displayed in line break mode, but does not change their logic and semantics. SQL formatting takes effect for all the SQL statements in the SQL window. You cannot format only one selected statement.
Execute SQL Plan	Reports execution of SQL statements to make troubleshooting easy and optimize SQL processing performance.
SQL Favorites	Allows you to add, view, and manage frequently-used SQL statements.
Save Executed SQL Statements	After this function is enabled, the system saves the recently executed SQL statements to the server.

Function	Description
SQL Input Prompt	Helps you quickly enter a specific database, table, or field name when you enter a SQL statement in the SQL window.
Full Screen	Shows SQL statements on a full screen.
Executed SQL Statements	Shows SQL execution details.
Messages	Shows the information returned after a SQL statement is executed.
Result Set	Shows SQL execution results. Allows you to view details about a single row, add a row, submit for editing, delete a row, export a row, copy a row, copy a column, set a column, and more.
Overwrite/Append Mode	<ul style="list-style-type: none">● Append Mode: Each time a SQL statement is executed, the new result set is appended to the previous one.● Overwrite Mode: Each time a SQL statement is executed, the new result set overwrites the previous one.

Opening the SQL Window

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

----End

8.3.2 Executing SQL Statements

This section describes how to execute various SQL statements.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)



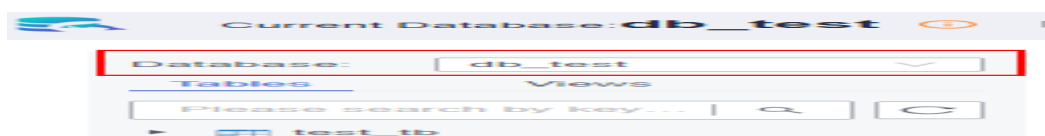
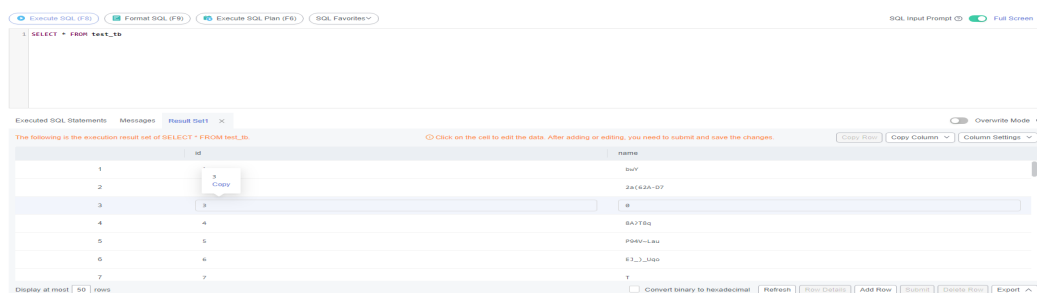
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- Step 7** In the upper left corner of the page, select a database from the drop-down list.

Figure 8-10 Selecting a database



- Step 8** Enter a SQL statement in the SQL window and click **Execute SQL**.

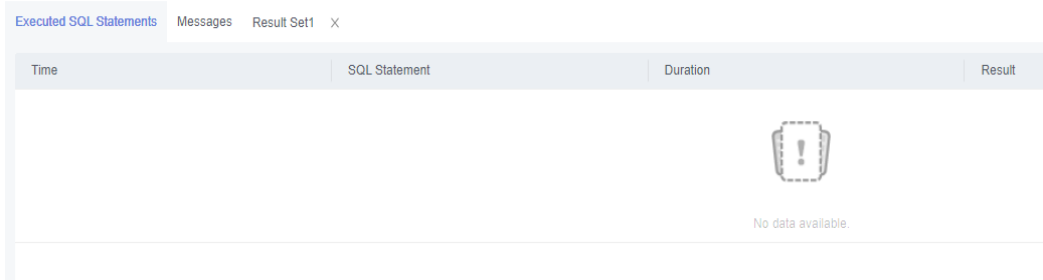
Figure 8-11 Executing a SQL Statement



- Enabling **SQL Input Prompt** is recommended. It helps you select the required database, table, or field name when you enter a SQL statement in the SQL window.
- To protect query result sets from being displayed as garbled characters, select an encoding format other than the default encoding format, UTF-8.
- You can execute multiple SQL statements at a time. Separate them using semicolons (;). You can click **Full Screen** to view logics in SQL statements clearly.
 - To execute some of the SQL statements, select the statements before executing them.
 - To execute all SQL statements, do not select any SQL statements or select all SQL statements.

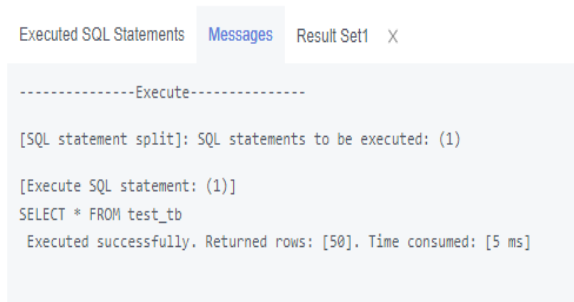
- Step 9** View execution details of the current SQL statement and previously executed SQL statements in the lower part of the page.

Figure 8-12 Viewing execution records



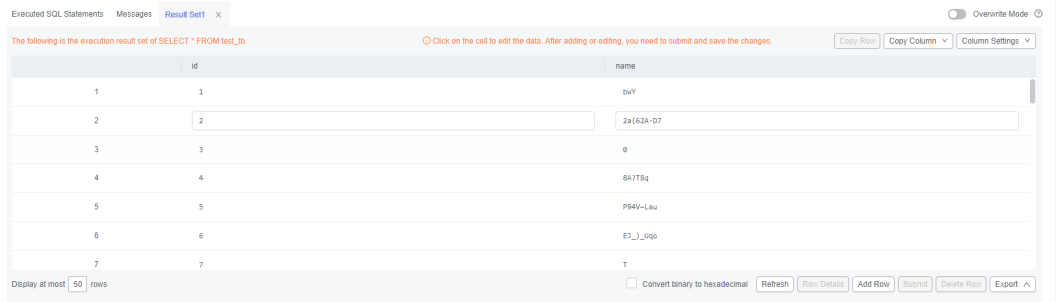
Step 10 Click the **Messages** tab, view SQL execution details, including affected rows, progress, and time required.

Figure 8-13 Viewing messages



Step 11 On the **Result Set** tab, view SQL execution results.

Figure 8-14 Viewing result sets



You can also perform the operations described in [Table 8-5](#) on result sets.

Table 8-5 Operations

Function	Description
Copy Row and Copy Column	Copies a row or column for reuse.
Column Settings	Customizes the display of columns when there are a number of columns in the query result.

Function	Description
Convert binary to hexadecimal	Converts binary data in the result set into hexadecimal data for display.
Refresh	Refreshes changed data.
Row Details	Displays the column field name, type, and data of the selected row.
Add Row	Adds an empty row to the result set.
Submit	Allows you to view the SQL statements to be modified. After you click OK , the result set is updated.
Delete Row	Deletes the selected row, including data.
Export	The SQL, CSV, and Excel files are supported. No more than 7.84 MB of data with 10,000 records can be exported. The actual size of an Excel file may exceed 7.84 MB due to its format.
Export More	Redirects you to the data export page and allows you to export over 10,000 rows of data.

 **NOTE**

- If the result set involves a view, data in the result set cannot be edited.
- If the type of the result set is metadata, the data cannot be edited or displayed on multiple pages.
- If the result set involves multiple tables, data in the result set cannot be edited.
- If only one table is in the result set and does not contain all primary key columns or any primary keys, you cannot edit the data.
- Data in virtual tables (for example, tables generated during execution of a stored procedure) cannot be edited.

----End


8.3.3 SQL Execution Plan

This section describes how to analyze the execution efficiency of a SQL statement.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

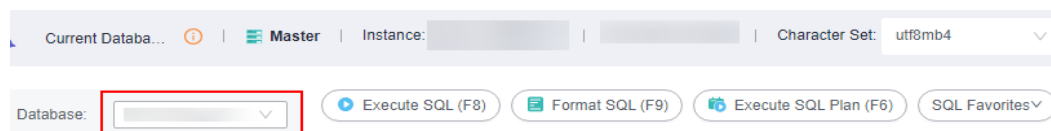
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

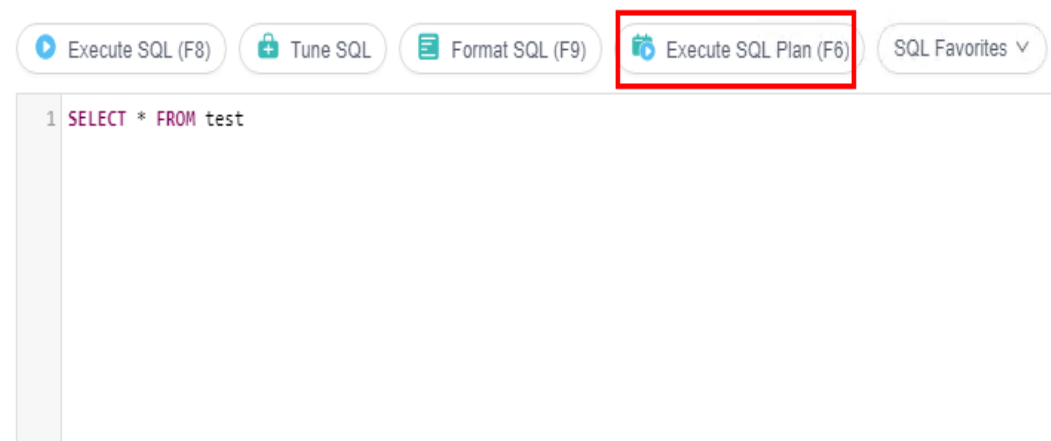
Step 7 Select a database in the upper left corner of the page.

Figure 8-15 Selecting a database



Step 8 Enter a SQL statement in the SQL window and click **Execute SQL Plan**.

Figure 8-16 Executing SQL plan



- On the **Executed SQL Statements** tab page, view SQL execution history.
- On the **Messages** tab page, view the execution information, including SQL splitting, execution status, and time required.
- On the **Execution Plan** tab page, view SQL execution details. Execution plan details of SQL statements are displayed on different tabs.

----End

8.3.4 SQL Favorites

This section describes how to add frequently-used SQL statements and view and manage them.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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


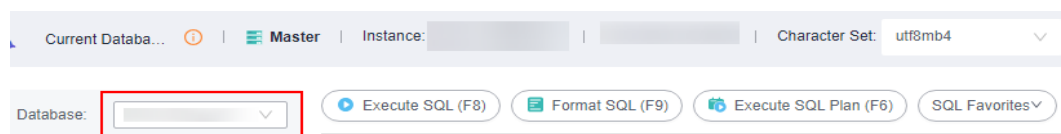
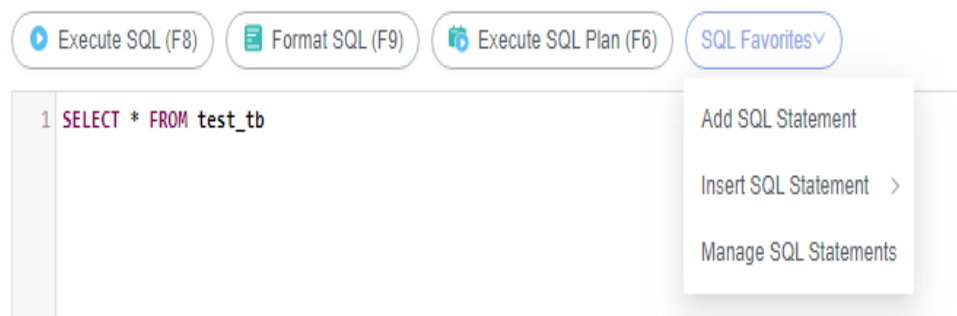
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- Step 7** Select a database in the upper left corner of the page.

Figure 8-17 Selecting a database



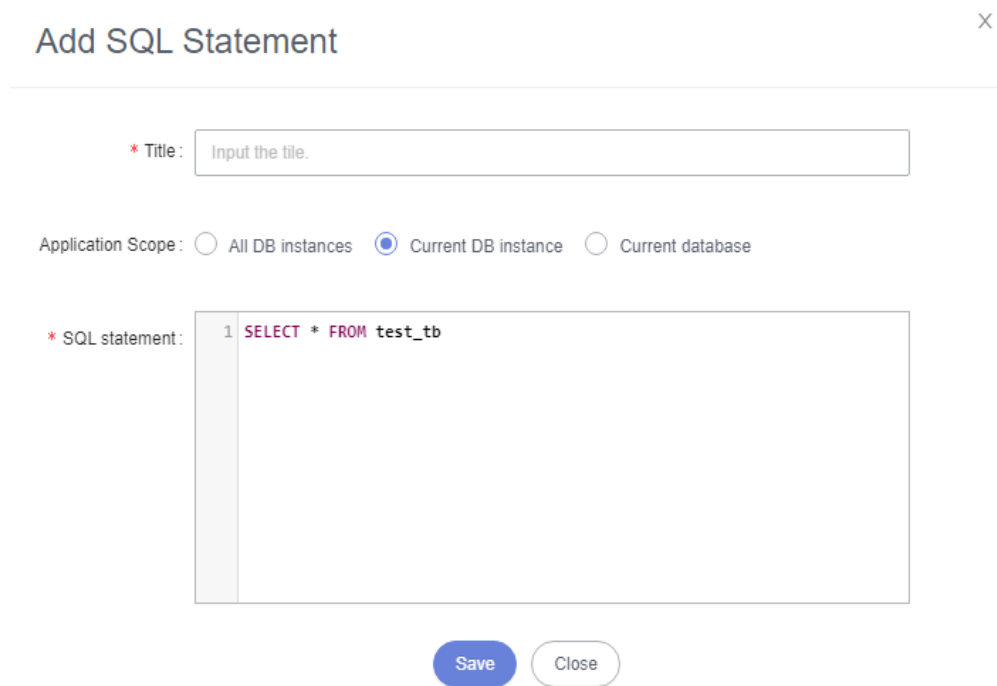
- Step 8** Choose **SQL Favorites**.

Figure 8-18 SQL favorites



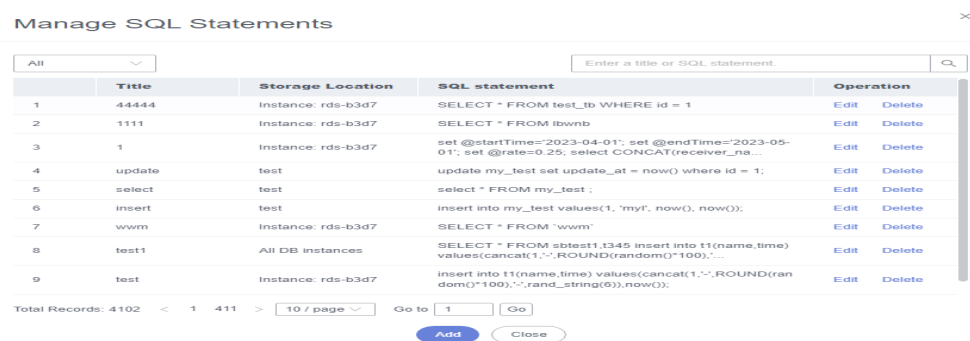
- **Add SQL Statement:** allows you to add frequently-used SQL statements. Specifically, specify a title, select an application scope, enter SQL statements, and then click **Save**.

Figure 8-19 Adding a SQL statement



- **Insert SQL Statement:** allows you to view the SQL statements you have added. If there are no SQL statements stored in your account, this option will not be displayed.
- **Manage SQL Statements:** allows you to manage your SQL statements, including adding, editing, and deleting statements.

Figure 8-20 Managing SQL statements



----End

8.3.5 SQL History

After you toggle on **Save Executed SQL Statements**, DAS will save the SQL statements you executed in the SQL window for future view. You can also execute the SQL statements again with no need to enter them again in the SQL window.

Prerequisites

You have enabled **Save Executed SQL Statements** in the upper right corner of the **SQL Query** page. After this function is enabled, executed SQL statements will be saved on the DAS management host.

Constraints on Usage

SQL statement execution records can be stored for up to one year.

Procedure



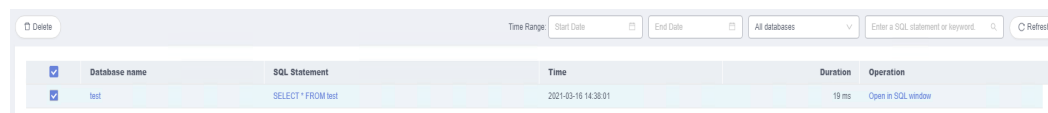
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL History**.
- Step 7** On the displayed page, search for execution information about the target SQL statement by time range, database name, or keyword.

Figure 8-21 SQL history



Database name	SQL Statement	Time	Duration	Operation
test	SELECT * FROM test	2021-03-16 14:38:01	19 ms	Open in SQL window

- To access the **Database Management** page, click a database name.
- To copy a SQL statement, click it in the **SQL Statement** column.
- To execute a SQL statement, click **Open in SQL window** in the **Operation** column.

----End

8.4 Table Management

8.4.1 Creating a Table

A TaurusDB database table consists of basic information, columns, generated columns, indexes, and foreign keys, among which generated columns, indexes, and foreign keys are optional.

Procedure



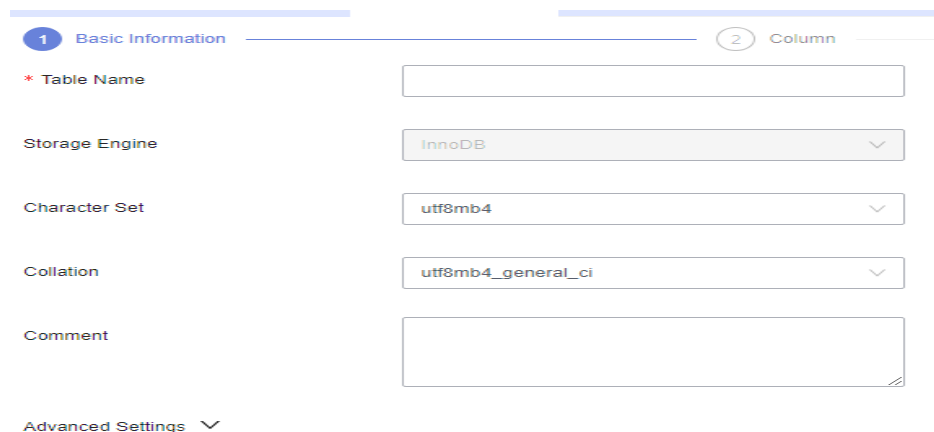
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**. On the displayed **Objects** page, select **Tables** and click **Create Table**.
- Step 7** On the displayed page, specify required parameters.

Figure 8-22 Basic Information



The screenshot shows a web interface with two tabs: '1 Basic Information' (active) and '2 Column'. Under the 'Basic Information' tab, there are several form fields:

- * Table Name**: A text input field.
- Storage Engine**: A dropdown menu with 'InnoDB' selected.
- Character Set**: A dropdown menu with 'utf8mb4' selected.
- Collation**: A dropdown menu with 'utf8mb4_general_ci' selected.
- Comment**: A text area.
- Advanced Settings**: A section with a downward arrow.

- Step 8** Click **Advanced Settings**, specify required parameters based on service requirements. These parameters are mandatory.

Figure 8-23 Advanced settings

Advanced Settings ^

Partition	<input type="radio"/> Yes <input checked="" type="radio"/> No
Partition Definition	<div style="border: 1px solid #ccc; height: 40px; background-color: #f0f0f0;"></div>
Auto Increment Initial Value	<input type="text"/>
Table Space	<input type="text"/>
Row Format	<input type="text" value="v"/>
Compress	<input type="radio"/> ZLIB <input type="radio"/> LZ4 <input type="radio"/> NONE

To learn more about partitioned table, see the following note.

Table partitioning is used to divide a large table into several small tables based on conditions. Different rows in the table can be allocated to different physical partitions. Creating a partitioned table is not recommended because there are many constraints on MySQL partitioned tables.

If you need to create a partitioned table, you can create one by referring to the following example. The supported partitioning methods are RANGE, LIST, COLUMNS, KEY, and HASH.

For example, if you want to create partitioned table **employees**, enter the following content for **Partition Definition**:

Creating a partitioned table:

```
CREATE TABLE employees (
  id INT NOT NULL,
  fname VARCHAR(30),
  lname VARCHAR(30),
  hired DATE NOT NULL DEFAULT '1970-01-01',
  separated DATE NOT NULL DEFAULT '9999-12-31',
  job_code INT NOT NULL,
  store_id INT NOT NULL
)
PARTITION BY RANGE (store_id) (
  PARTITION p0 VALUES LESS THAN (6),
  PARTITION p1 VALUES LESS THAN (11),
  PARTITION p2 VALUES LESS THAN (16),
```

```
PARTITION p3 VALUES LESS THAN (21)
);
```

Specifying a partition definition:

```
PARTITION BY RANGE (store_id) (
PARTITION p0 VALUES LESS THAN (6),
PARTITION p1 VALUES LESS THAN (11),
PARTITION p2 VALUES LESS THAN (16),
PARTITION p3 VALUES LESS THAN (21)
)
```

Step 9 Click **Next**.

Step 10 On the **Column** page, click **Add** and set **Column Name**, **Type**, **Length**, **Nullable**, **Primary Key**, and **Extended Information** as needed.

- If you do not need to add generated columns, indexes, or foreign keys, click **Create** at the bottom of the page. In the displayed **SQL Preview** dialog box, click **Execute**.

Figure 8-24 Configuring fields

No.	Column Name	Type	Length	Nullable	Primary Key	Comment	Extended Information
1	ID	char	11	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Default: Fill in Manually
2	Name	char	12	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
3	Gender	char		<input type="checkbox"/>	<input type="checkbox"/>		Binary: <input type="checkbox"/>
4	Height	float		<input type="checkbox"/>	<input type="checkbox"/>		Character Set:

- If you need to add generated columns, indexes, and foreign keys, click **Next** until all your desired parameters are specified. Configure required parameters and click **Create**.

NOTE

- The length of a column name is limited. Enter no more than 64 characters.
- In the **Type** column, you can select only the parameters from the drop-down list box.
- In the **Length** column, retain the default value. For some columns whose length is variable, you can change their lengths.
- If **Primary Key** is selected, **Nullable** will be grayed out.
- **Auto Increment** can be set for one column only. When it is selected, **Primary Key** must be selected, and no default values can be set.
- When you create a foreign key, the type of columns in the referenced table must be the same as that of included columns, and must be the primary key or have a unique index.

Step 11 In the **SQL Preview** dialog box, click **Execute**.

----End

8.4.2 Opening a Table

If a table has primary keys, you can add, delete, modify, or query table data as you do in Excel.


Precautions

Tables in system databases cannot be modified.

Procedure

Step 1 Log in to the Huawei Cloud console.

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 On the displayed **Objects** tab, choose **Tables** on the left. In the table list, locate the table you want to open and click **Open** in the **Operation** column.

Figure 8-25 Opening a table



Step 8 On the displayed page, view table details.

Figure 8-26 Editing table data



You can also perform the operations listed in [Table 8-6](#).

Table 8-6 UI operations



Name	Description
Where Condition	Filters records.
Quickly Generate Test Data	Quickly generates test data for table structure testing and allows you to set rules.
Copy Row	Copies data of the selected row. Specifically, double-click the target row and then click Copy Row .
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.
Column Settings	Allows you to set the columns you want to display.
Convert binary to hexadecimal	Prevents binary data in columns from being displayed as garbled characters. If there is binary data in columns, you must select this option.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.
Add Row	Allows you to add rows.
Submit	Allows you to submit and save the changes to data.
Delete Row	Allows you to delete the selected rows.
Export	Exports a maximum of 10,000 data records to a CSV or SQL file.

----End

8.4.3 Viewing Details of a Table

This section describes how to view table information and the SQL statement for creating this table.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 On the displayed **Objects** tab, choose **Tables** on the left. In the table list, locate the table whose details you want to view and click **View** in the **Operation** column.

Figure 8-27 Viewing details of a table

Table Name	Created	Rows (Estimated)	Table Size	Index Size	Character Set	Operation
new_db_1_351	2020-07-20 13:51:38	1926095	54.59MB	0B	utf8mb4	Query SQL Statements Open View Alter Rename ...
test1	2020-08-05 15:53:35	0	19KB	0B	utf8mb4	Query SQL Statements Open View Alter Rename ...

Step 8 In the displayed dialog box, view basic information of the table and SQL statements for creating the table.

Figure 8-28 Viewing details of a table

View Table ✕

Basic Information
DDL

	Column Name	Value
1	Database	test1
2	Table Name	student
3	Row Count	0(Estimated)
4	Data Length	16KB
5	Index Length	0B
6	Character Set	utf8mb4
7	Collation	utf8mb4_general_ci
8	Row Format	Dynamic
9	Created	2020-08-31 14:46:39

Close

----End

8.4.4 Altering a Table

This section describes how to alter a table on the DAS console.

Usage Notes

Improper alterations on a table will cause instance or service exceptions.

Procedure



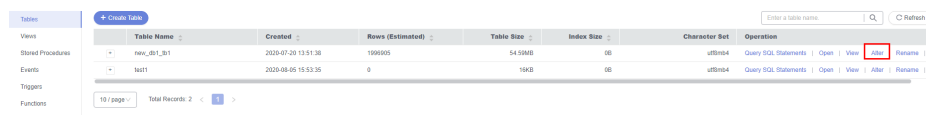
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**. On the displayed **Objects** tab, choose **Tables** on the left.
- Step 7** In the right pane, locate the table that you want to alter and click **Alter** in the **Operation** column.

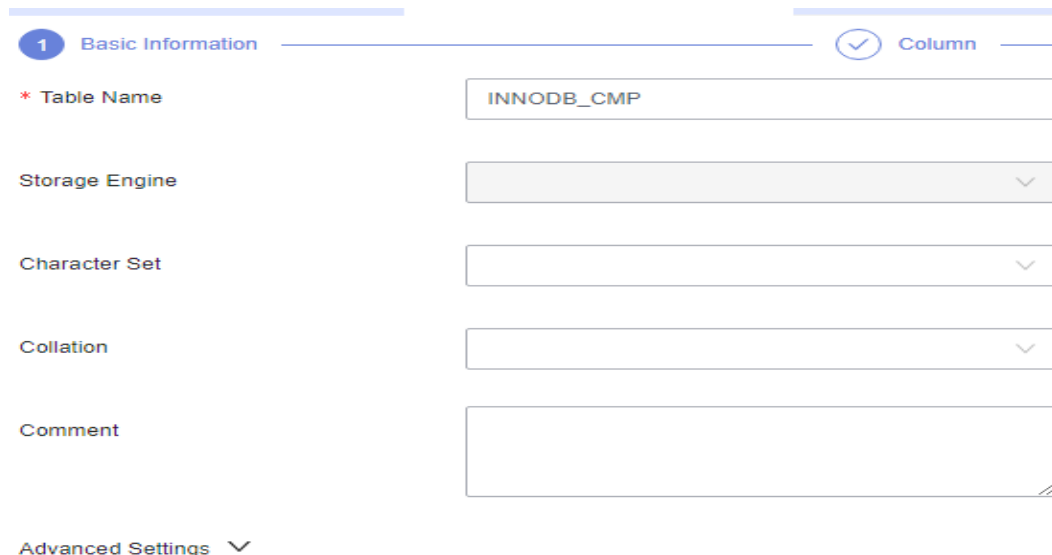
Figure 8-29 Altering a table



View	Table Name	Created	Rows (Estimate)	Table Size	Index Size	Character Set	Operation
Stored Procedures	new_db1_db1	2025-07-20 13:51:38	1556005	54.59KB	0B	utf8mb4	Query SQL Statements Open View Alter Rename ?
Views	test1	2025-08-05 15:53:35	0	19KB	0B	utf8mb4	Query SQL Statements Open View Alter Rename ?

- Step 8** On the displayed page, modify information such as table name and character set. After the modification is complete, click **Alter**.

Figure 8-30 Altering table information



1 Basic Information Column

* **Table Name**

Storage Engine

Character Set

Collation

Comment

Advanced Settings ▼

- Step 9** In the **SQL Preview** dialog box, click **Execute**.

----End

8.4.5 Renaming a Table

This section describes how to rename an existing table.

Procedure



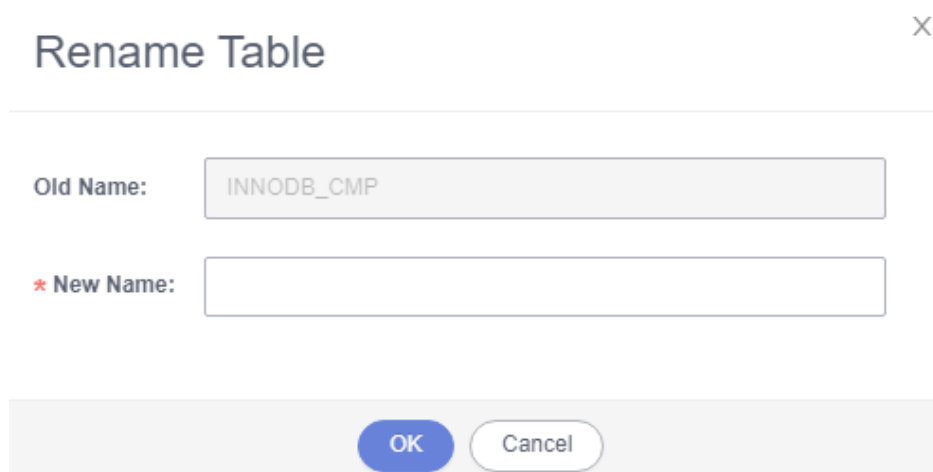
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**. On the displayed **Objects** tab, choose **Tables** on the left.
- Step 7** In the right pane, locate the table that you want to rename and click **Rename** in the **Operation** column.
- Step 8** In the displayed dialog box, enter a new table name and click **OK**.

Figure 8-31 Renaming a table



Rename Table ×

Old Name:

* New Name:

----End

8.4.6 Clearing a Table

This section describes how to clear data in a table.

Precautions

Cleared tables cannot be recovered. Exercise caution when performing this operation.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**. On the displayed **Objects** tab, choose **Tables** on the left.
- Step 7** In the right pane, locate the table you want to clear and choose **More > Clear** in the **Operation** column.
- Step 8** In the displayed dialog box, click **Yes**.

Figure 8-32 Clearing a table

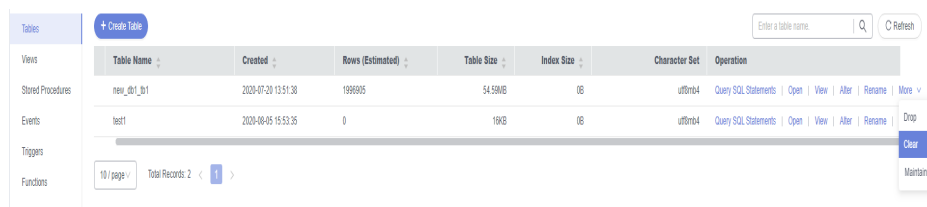


Table Name	Created	Rows (Estimated)	Table Size	Index Size	Character Set	Operation
new_db1	2020-07-20 13:51:30	1999905	54.59KB	0B	utf8mb4	Query SQL Statements Open View Alter Rename More
test1	2020-06-05 15:53:35	0	19KB	0B	utf8mb4	Query SQL Statements Open View Alter Rename Drop Clear Maintain

----End



8.4.7 Dropping a Table

This section describes how to drop a table that is no longer needed.

Precautions

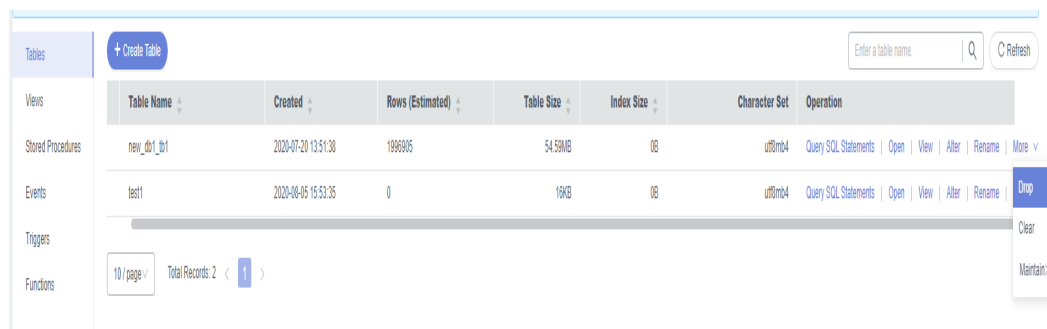
Dropped tables cannot be recovered. Exercise caution when performing this operation.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.

- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**. On the displayed **Objects** tab, choose **Tables** on the left.
- Step 7** In the right pane, locate the table you want to drop and choose **More > Drop** in the **Operation** column.

Figure 8-33 Dropping a table



- Step 8** In the displayed dialog box, click **Yes**.

----End

8.4.8 Maintaining a Table

While working with a database, you do a lot of changes to tables such as inserting, updating and deleting data. This occupies disk space and deteriorates database performance. To handle this, periodic maintenance is required.

Functions


- Check
 - Allows you to check whether there are errors in database tables using the CHECK TABLE statement. You can check a table with any of the following methods: **Check**, **Quick**, **Fast**, **Changed**, and **Extended**.
 - **Check**: scans rows to verify that deleted links are valid. Alternatively, calculate a key checksum for the rows and verifies the validity using the obtained checksum.
 - **Fast**: neither scans rows nor checks for incorrect links.
 - **Quick**: checks only tables that have not been closed properly.
 - **Changed**: checks only the tables that have been changed since the last check and the tables that have not been closed properly.
 - **Extended**: searches for keywords in each row.
- Repair
 - Allows you to use the REPAIR TABLE statement to repair possibly corrupted or incorrect tables. You can repair tables using any of the following three methods: **Check**, **Quick**, and **Extended**.
 - **Check**: a simple repair, which repairs data and index files.

- **Quick:** the quickest repair, which repairs only index files, but not data files.
- **Extended:** the slowest repair, which creates indexes row by row to repair data and index files.

Check

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**. On the displayed **Objects** tab, choose **Tables** on the left.

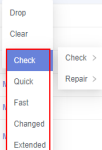
Step 7 In the right pane, locate the table you want to maintain and choose **More > Maintain > Check** in the **Operation** column.

Step 8 Select a check method as required.

You can check a table with any of the following methods: **Check**, **Quick**, **Fast**, **Changed**, and **Extended**.

Figure 8-34 Selecting a check method

Table Name	Created	Rows(Estimated)	Table Size(Estimated)	Index Size(Estimated)	Character Set	Operation
+ INNODB_CMP	2023-07-05 17:28:41	0(Estimated)	0B(Estimated)	0B(Estimated)		Query SQL Statements Open View Alter Rename More >
+ INNODB_CMPMEM_RESET	2023-07-05 17:28:41	0(Estimated)	0B(Estimated)	0B(Estimated)		Query SQL Statements Open View Alter Rename More >
+ INNODB_CMP_RESET	2023-07-05 17:28:41	0(Estimated)	0B(Estimated)	0B(Estimated)		Query SQL Statements Open View Alter Rename More >
+ INNODB_CMP_PER_INDEX	2023-07-05 17:28:41	0(Estimated)	0B(Estimated)	0B(Estimated)		Query SQL Statements Open View Alter Rename More >
+ INNODB_CMPMEM	2023-07-05 17:28:41	0(Estimated)	0B(Estimated)	0B(Estimated)		Query SQL Statements Open View Alter Rename More >
+ INNODB_CACHED_INDEXES	2023-07-05 17:28:41	0(Estimated)	0B(Estimated)	0B(Estimated)		Query SQL Statements Open View Alter Rename More >
+ INNODB_CMP_PER_INDEX_RESET	2023-07-05 17:28:41	0(Estimated)	0B(Estimated)	0B(Estimated)		Query SQL Statements Open View Alter Rename More >




Step 9 In the displayed dialog box, click **Yes**.

----End

Repair

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab, choose **Tables** on the left.
- Step 8** Locate the table you want to repair and choose **More > Maintain > Repair** in the **Operation** column.

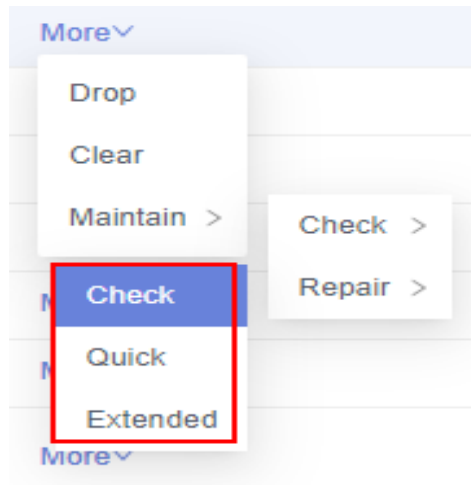
Figure 8-35 Repair

Table Name	Created	Rows(Estimated)	Table Size(Estimated)	Index Size(Estimated)	Character Set	Operation
+	INNOB_CMP	2023-07-05 17:28:41	0(Estimated)	0B(Estimated)	0B(Estimated)	Query SQL Statements Open View Alter Rename More
+	INNOB_CMPMEM_RESET	2023-07-05 17:28:41	0(Estimated)	0B(Estimated)	0B(Estimated)	Query SQL Statements Open View Alter Rename More
+	INNOB_CMP_RESET	2023-07-05 17:28:41	0(Estimated)	0B(Estimated)	0B(Estimated)	Query SQL Statements Open View Alter Rename More
+	INNOB_CMP_PER_INDEX	2023-07-05 17:28:41	0(Estimated)	0B(Estimated)	0B(Estimated)	Query SQL Statements Open View Alter Rename More
+	INNOB_CMPMEM	2023-07-05 17:28:41	0(Estimated)	0B(Estimated)	0B(Estimated)	Query SQL Statements Open View Alter Rename More
+	INNOB_CACHED_INDEXES	2023-07-05 17:28:41	0(Estimated)	0B(Estimated)	0B(Estimated)	Query SQL Statements Open View Alter Rename More
+	INNOB_CMP_PER_INDEX_RESET	2023-07-05 17:28:41	0(Estimated)	0B(Estimated)	0B(Estimated)	Query SQL Statements Open View Alter Rename More

- Step 9** Select a repair method as required.

You can repair tables using any of the following three methods: **Check**, **Quick**, and **Extended**.

Figure 8-36 Selecting a repair method



- Step 10** In the displayed dialog box, click **Yes**.

----End

8.5 View Management

8.5.1 Creating a View

This section describes how to create a view on the DAS console.

Procedure



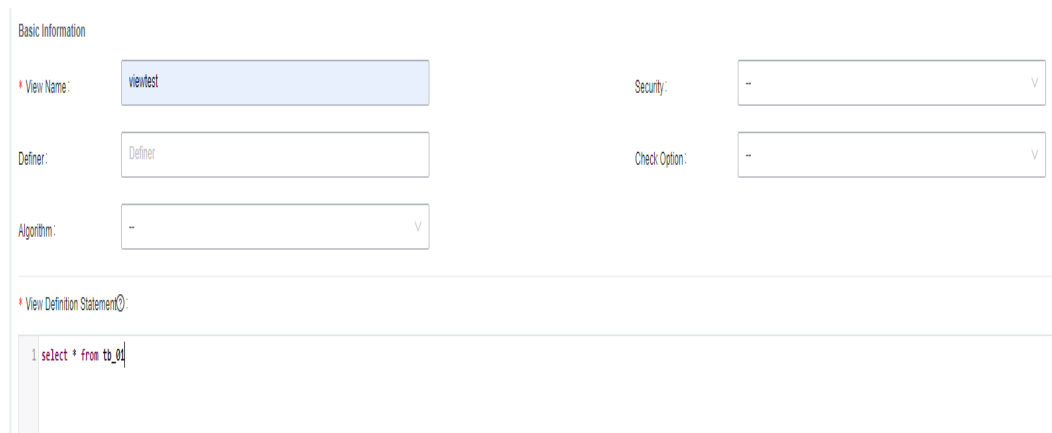
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** page, select **Views**. In the upper left corner of the page, click **Create View**.
- Step 8** On the displayed page, specify information such as view name and definer as required and click **Create**.

Figure 8-37 Configuring parameters



Basic Information

* View Name: Security:

Definer: Check Option:

Algorithm:

* View Definition Statement:

```
1 select * from tb_01
```

Table 8-7 Parameter description

Parameter	Description
View Name	(Mandatory) Enter a view name.
Definer	Enter a definer.

Parameter	Description
Algorithm	(Optional) You can leave this parameter blank or set it to MERGE , TEMPTABLE , or UNDEFINED . <ul style="list-style-type: none">• UNDEFINED: The required algorithm is automatically selected.• MERGE: A combination algorithm. Executing this algorithm will combine and execute SQL statements of the view and those of the external query view.• EMPTABLE: The result is stored in a temporary table for query.
Security	(Optional) You can leave this parameter blank or set it to DEFINER or INVOKER . <ul style="list-style-type: none">• DEFINER: When the view is executed, the user account specified by DEFINER will be used to check access privileges for the view.• INVOKER: When the view is executed, the user account specified by INVOKER will be used to check access privileges for the view.
Check Option	(Optional) You can leave this parameter blank or set it to LOCAL or CASCADED . <ul style="list-style-type: none">• If you select CASCADED for Check Option, the view that the current view depends on will also have the check option.• If you select LOCAL for Check Option, the system checks whether the view that the current view depends on has check options. If yes, the system checks the view that the current view depends on. If no, the system does not check the view.
View Definition Statement	Enter a SQL statement for creating the view. You only need to enter the SELECT part.

Step 9 In the displayed dialog box, click **Execute**.

----End

8.5.2 Opening a View

This section describes how to view details of a view on the DAS console.

Precautions

Views do not have primary keys and their data can only be queried.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).



- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** page, choose **Views**. In the right pane, locate the view that you want to open and click **Open** in the **Operation** column.

Figure 8-38 Opening a view



- Step 8** On the displayed page, view details of the view.

Figure 8-39 Viewing details of a view

id	var1	var2	var3
1	U=0	T	R0864+C
2	LUR6+S	7H	J
3	OY2W	+82	8P
4	iv	87w	NV'S+GQ
5	U2	+D2087F	FB=0
6	1*+G	%Y2	_8
7	68W=6	M8D=Cx	N+*4
8	Y5W+L5	-L_K22W	Fnd
9	3SD1	F	+2K22P
10	8E+QW	DX	737360
11	88u3q	2222RL	_J
12	Q2%6	-	5h
13	uCPJ	egh	h8
14	ku	+3GOT	Qp%084
15	gare%K	8AK	95RTOut
16	800W+1DX	84	h/K3u
17	8FLV	Awgr=C	u

You can also perform the operations listed in [Table 8-8](#).

Table 8-8 UI operations

Name	Description
Where Condition	Filters records.
Copy Row	Copies data of the selected row. Specifically, double-click the target row and then click Copy Row .
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.

Name	Description
Column Settings	Allows you to set the columns you want to display.
Convert binary to hexadecimal	Prevents binary data in columns from being displayed as garbled characters. If there is binary data in columns, you must select this option.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.
Export	Exports a maximum of 10,000 data records to a CSV or SQL file.

----End

8.5.3 Altering a View

This section describes how to modify the definition, security, and algorithm of a view on the DAS console.

Usage Notes

Improper alterations on a view will cause instance or service exceptions.

Procedure



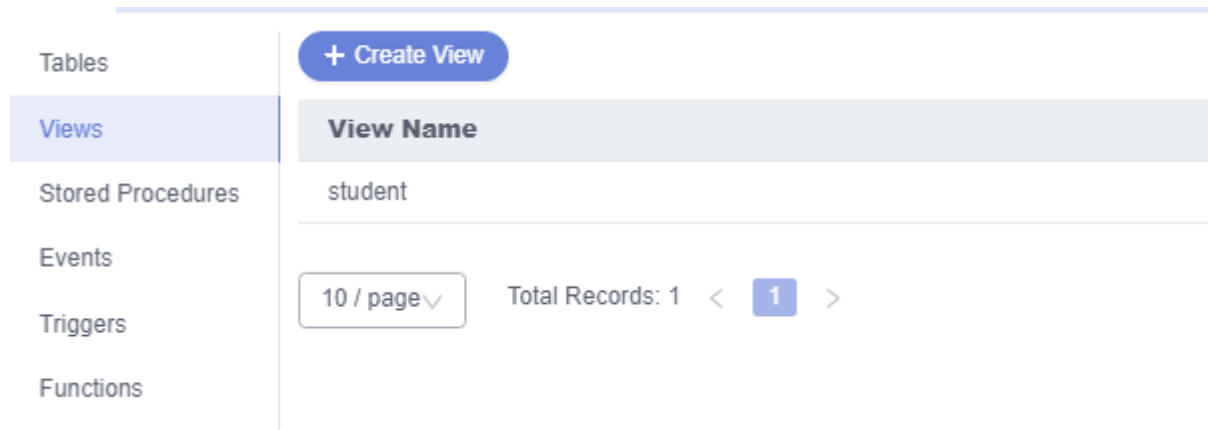
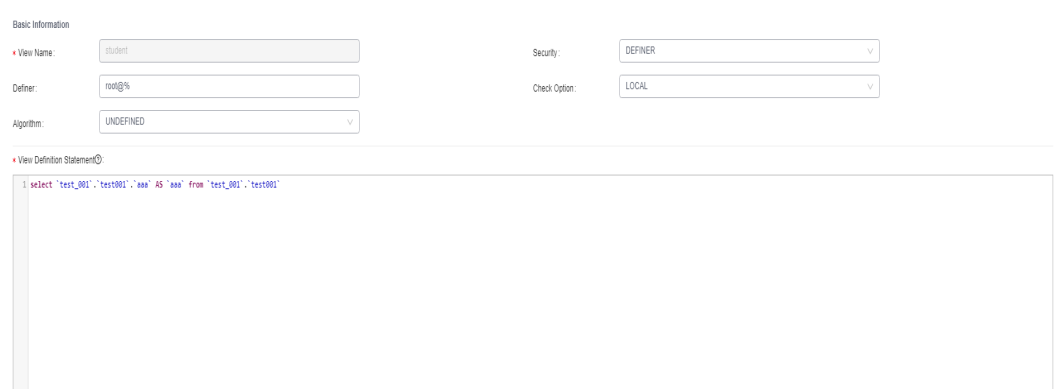
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** page, choose **Views**. In the right pane, locate the view that you want to alter and click **Alter** in the **Operation** column.

Figure 8-40 Altering a view



Step 8 On the displayed page, modify information of the view, including the security, algorithm, and definition.

Figure 8-41 Altering view information



Step 9 Click **Alter** at the bottom of the page.

Step 10 In the displayed dialog box, click **Execute**.

----End

8.5.4 Dropping a View

This section describes how to drop a view that is no longer needed.

Precautions

Dropped views cannot be recovered. Exercise caution when performing this operation.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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


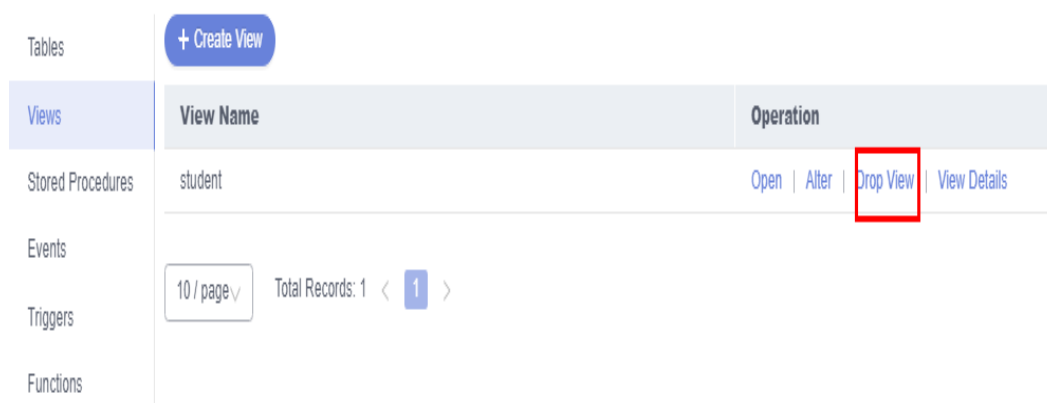
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** page, choose **Views**. In the right pane, locate the view that you want to drop and click **Drop View** in the **Operation** column.

Figure 8-42 Dropping a view



- Step 8** In the displayed dialog box, click **Yes**.

----End

8.6 Event Management


8.6.1 Creating an Event

This section describes how to create an event to periodically respond to specific operations.

If you set **event_scheduler** to **ON** and enable the event function, you can manage events.

When **event_scheduler** is set to **OFF**, but the event function is enabled, you can only create events and the events do not take effect. For details about how to set parameter **event_scheduler**, contact TaurusDB technical support.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.


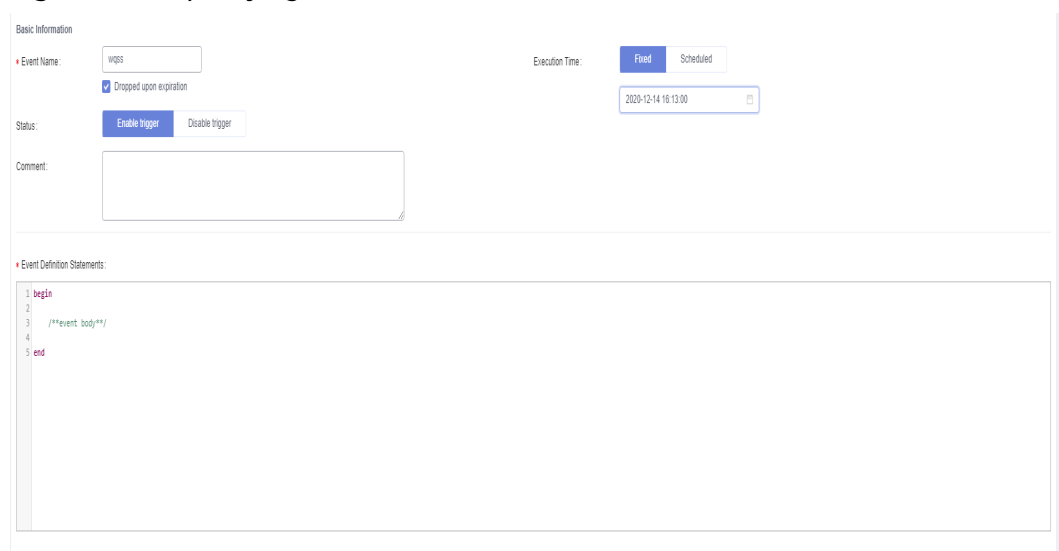
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** page, select **Events**. In the upper left corner of the page, click **Create Event**.

Figure 8-43 Creating an event



- Step 8** Enter an event name (mandatory) and event definition statements (mandatory), set the execution time, status, and comment, and click **Create**.

Figure 8-44 Specifying event information



- **Event Definition Statements**

Indicates the SQL statements to be executed when a scheduled event is triggered.

- **Dropped upon expiration**

Indicates that the event to be executed at a fixed time will be deleted after it is executed and the event to be executed in a scheduled cycle will be deleted at the specified time.

Step 9 In the displayed dialog box, click **Execute**. If there are no errors reported, the event takes effect.

----End

8.6.2 Altering an Event

This section describes how to alter an event.


Usage Notes

Improper alterations on an event will cause instance or service exceptions.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

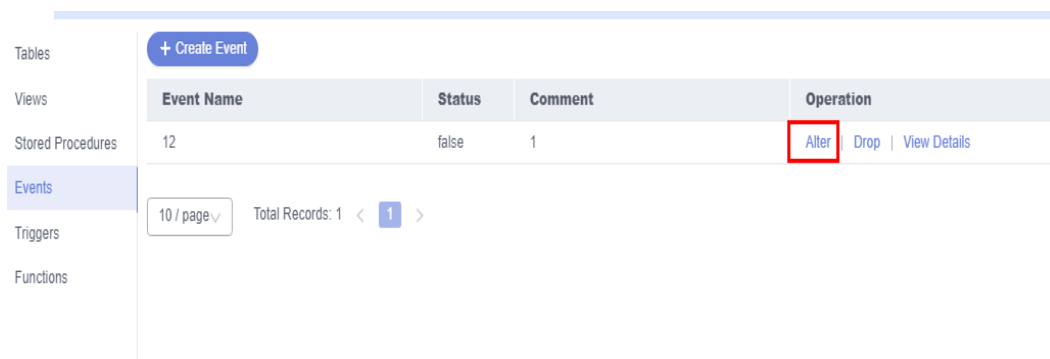
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 On the displayed **Objects** page, choose **Events**. In the right pane, locate the event that you want to alter and click **Alter** in the **Operation** column.

Figure 8-45 Altering an event



Step 8 On the displayed page, modify the required information and click **Alter**.

Figure 8-46 Altering event information

Basic Information

Event Name: Execution Time:

Dropped upon expiration

Status:

Comment:

2020-12-14 15:46:53

Event Definition Statements:

```
1 begin
2
3 select * from test001;
4
5 end
```

Step 9 In the displayed dialog box, click **Execute**.

----End

8.6.3 Dropping an Event

This section describes how to drop an event that is no longer needed.


Precautions

Dropped events cannot be recovered. Exercise caution when performing this operation.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 On the displayed **Objects** page, choose **Events**. In the right pane, locate the event you want to drop and click **Drop** in the **Operation** column.

Figure 8-47 Dropping an event

Step 8 In the displayed dialog box, click **Yes**.

-----End

8.7 Stored Procedure Management

8.7.1 Creating a Stored Procedure

A stored procedure consists of a set of SQL statements that can complete specific tasks or process complex services. This section describes how to create a stored procedure. You can use loop statements in a stored procedure to insert objects repeatedly.


Prerequisites

- You have obtained the CREATE ROUTINE permission.
- You have obtained the EXECUTE permission.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

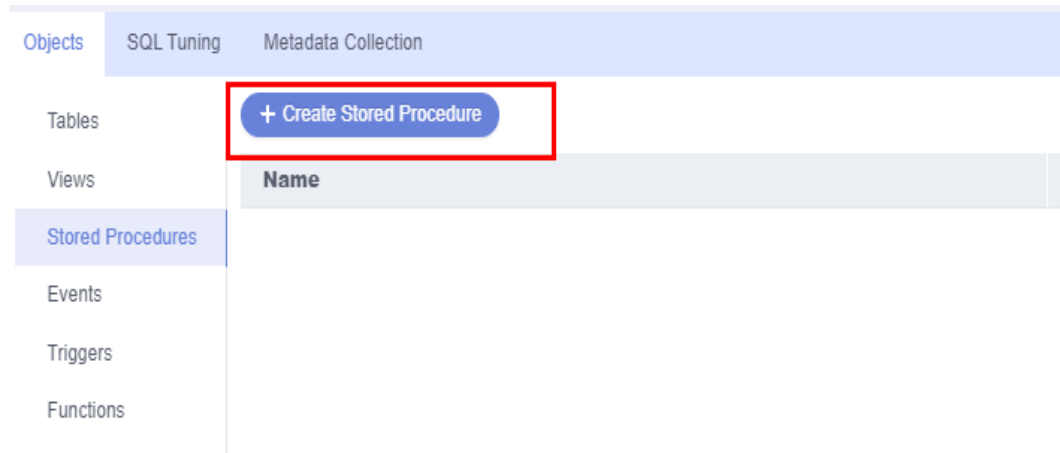
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

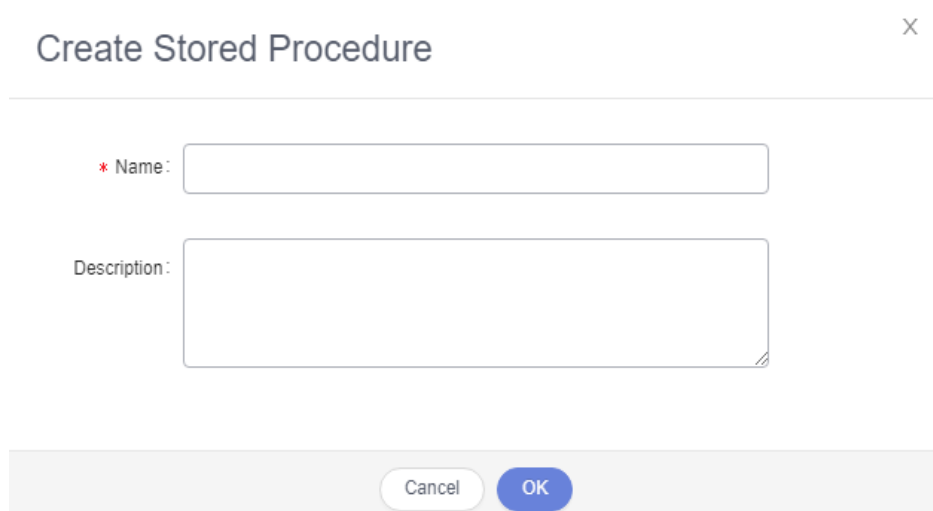
Step 7 On the displayed **Objects** page, select **Stored Procedures**. In the upper left corner of the page, click **Create Stored Procedure**.

Figure 8-48 Creating a stored procedure



Step 8 In the displayed dialog box, enter a stored procedure name and description.

Figure 8-49 Specifying stored procedure information



Step 9 Click **OK**.

Step 10 On the displayed page, click **Option**, set the required parameters, and click **OK**. Then, save and execute the stored procedure.

Figure 8-50 Setting parameters

Option ×

SQL Security: Default INVOKER DEFINER

Determinacy: DETERMINISTIC NOT DETERMINISTIC

Data Access: Default CONTAINS SQL NO SQL READS SQL DATA
MODIFIES SQL DATA

OK Cancel

Step 11 View the execution status in the **Message** area.

Figure 8-51 Viewing the execution of the stored procedure

Option
Save
Execute

```

1 CREATE PROCEDURE `sws1`()
2 BEGIN
3
4
5 END
    
```

Message

[Execute SQL]
CALL `test_001`.`sws1`();
Executed successfully. Duration: 9 ms.

----End

8.7.2 Altering or Executing a Stored Procedure

This section describes how to alter or execute a stored procedure on the DAS console.

Usage Notes

Improper alterations on a stored procedure will cause instance or service exceptions.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)



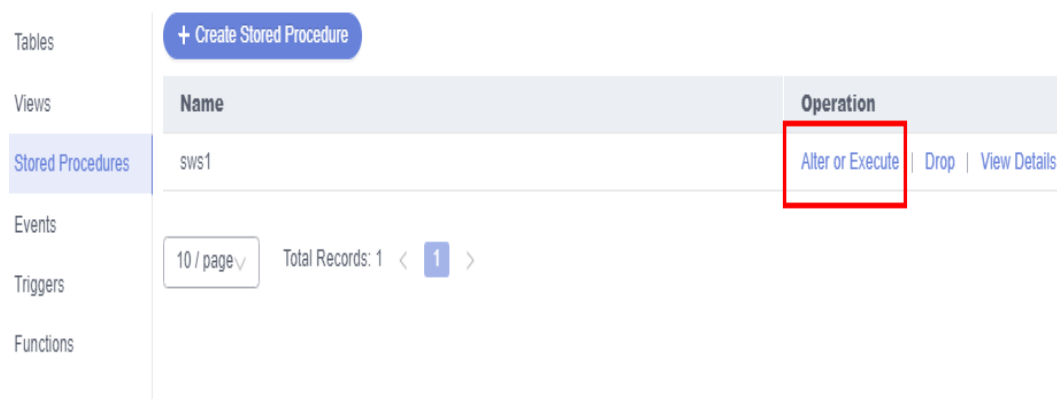
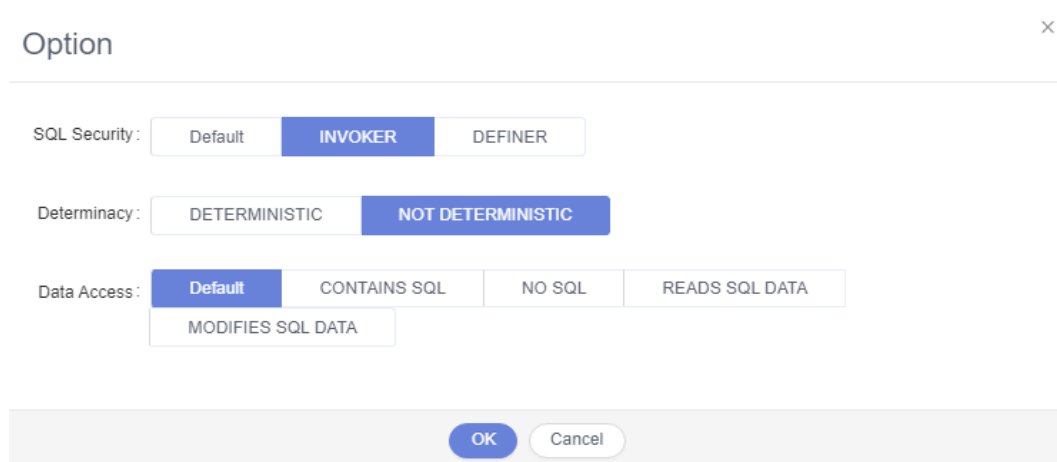
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** page, choose **Stored Procedures**. In the right pane, locate the stored procedure you want to alter or execute and click **Alter or Execute** in the **Operation** column.

Figure 8-52 Altering or executing a stored procedure

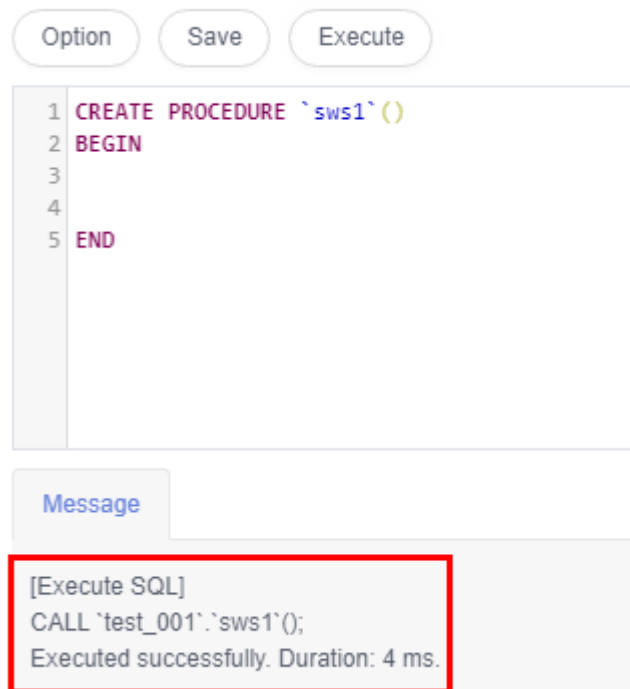


- Step 8** On the displayed page, click **Option** to set parameters and click **OK**. Then, click **Save**.

Figure 8-53 Setting parameters



- Step 9** Execute the stored procedure and view the execution status in the **Message** area.

Figure 8-54 Viewing the execution of the stored procedure

----End



8.7.3 Dropping a Stored Procedure

This section describes how to drop a stored procedure that is no longer needed.

Precautions

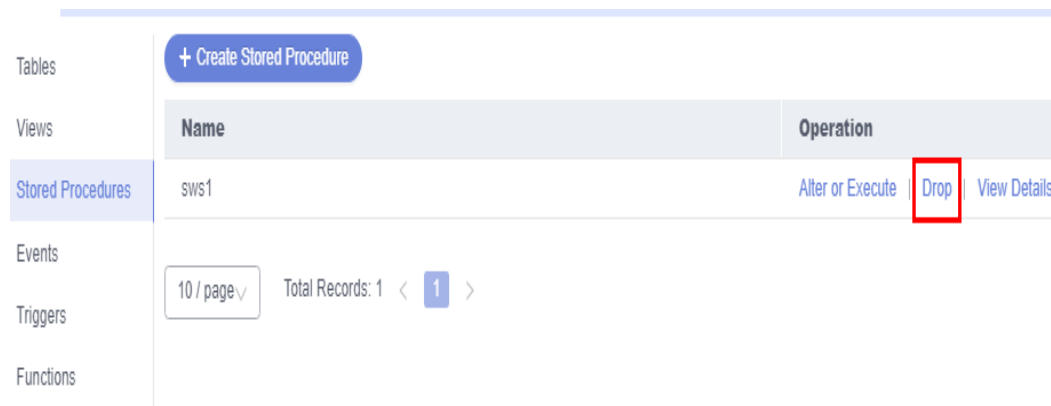
Dropped stored procedures cannot be recovered. Exercise caution when performing this operation.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.

- Step 7** On the displayed **Objects** page, choose **Stored Procedures**. In the right pane, locate the stored procedure you want to drop and click **Drop** in the **Operation** column.

Figure 8-55 Dropping a stored procedure



- Step 8** In the displayed dialog box, click **Yes**.

----End

8.8 Function Management

8.8.1 Creating a Function

Functions can improve modularity of applications and code reusability. This section describes how to create a function on the DAS console.

Procedure



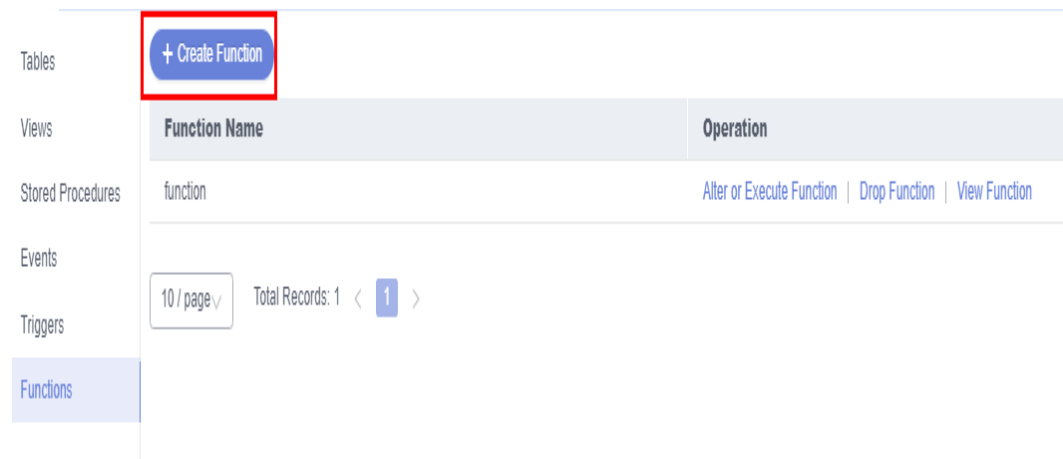
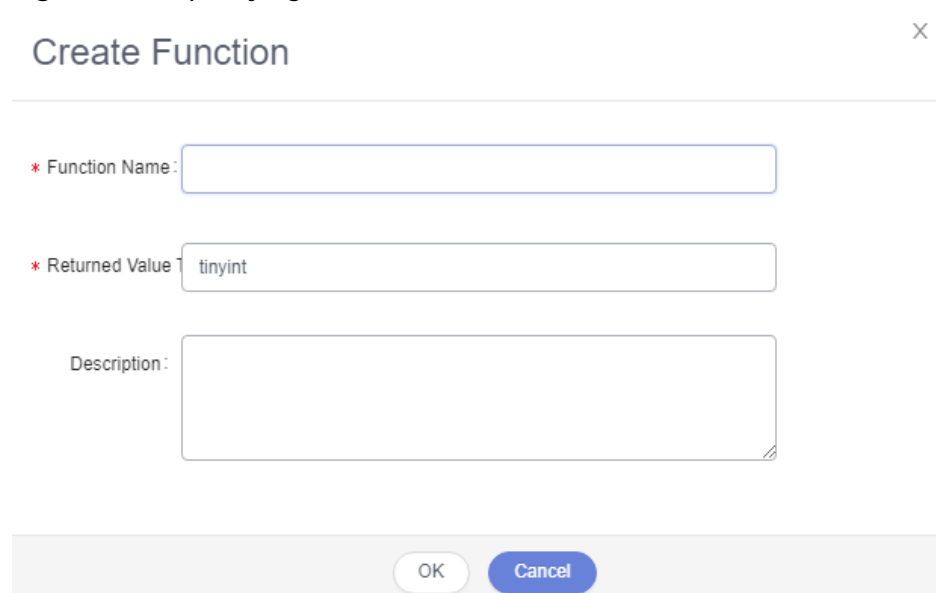
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** page, select **Functions**. In the upper left corner of the page, click **Create Function**.

Figure 8-56 Creating a function



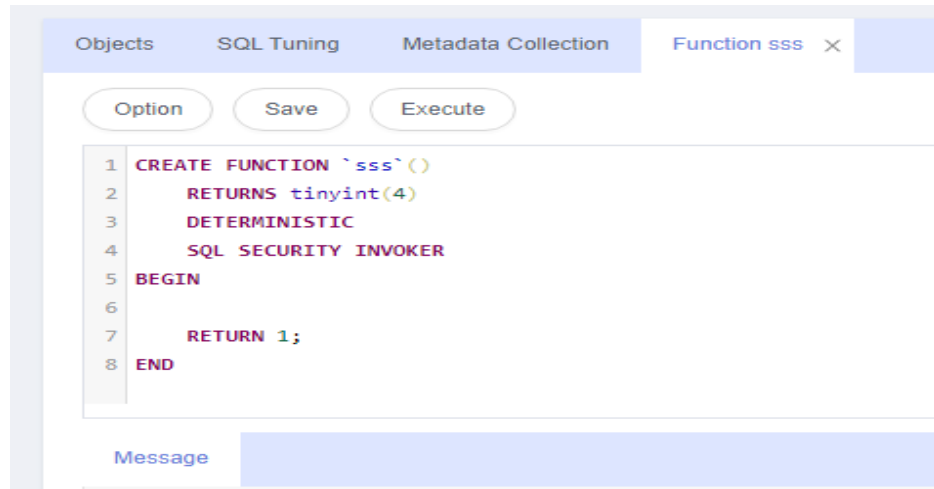
Step 8 In the displayed dialog box, enter a function name, returned value type, and description, and click **OK**.

Figure 8-57 Specifying function information



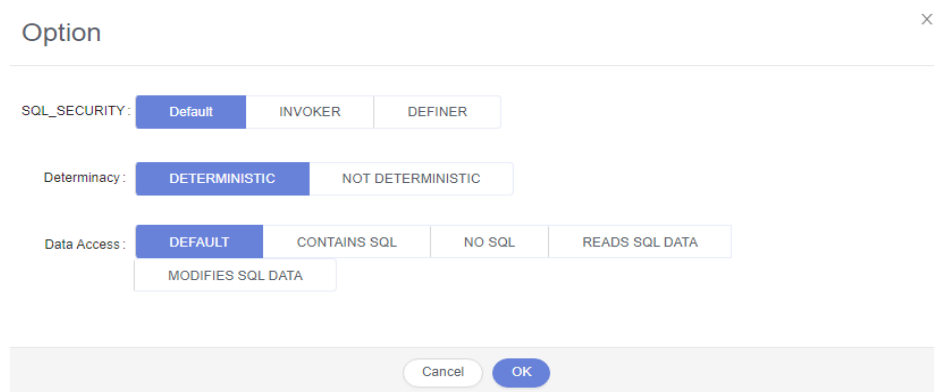
Step 9 On the displayed page, edit the function body.

Figure 8-58 Editing the function body



Step 10 In the upper left corner, click **Option**. In the displayed dialog box, set required parameters and click **OK**.

Figure 8-59 Setting parameters



Step 11 Click **Save** or **Execute** and view the status in the **Message** area.

Figure 8-60 Viewing the execution of the function

----End



8.8.2 Altering or Executing a Function

This section describes how to alter or execute a function on the DAS console.

Usage Notes

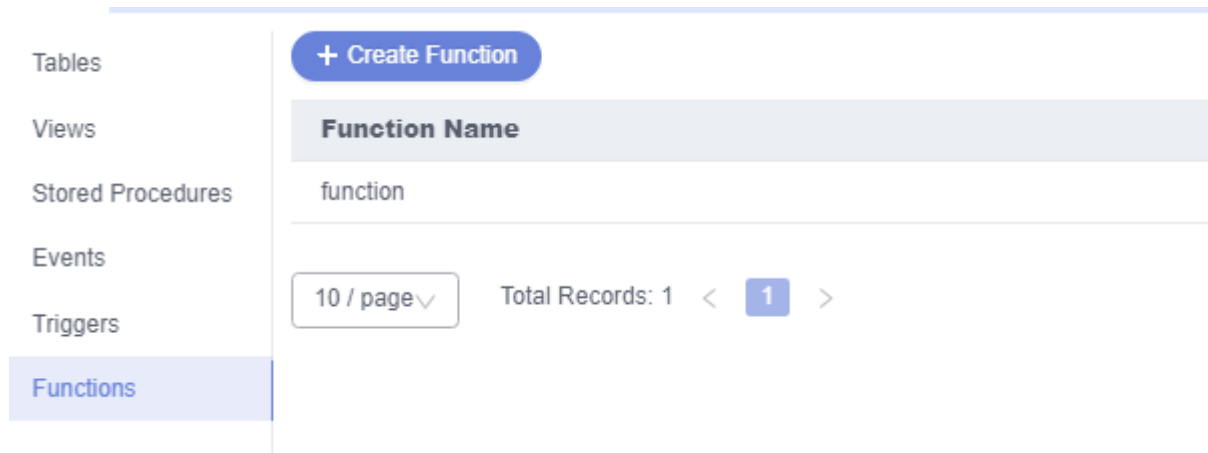
Improper alterations on a function will cause instance or service exceptions.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.

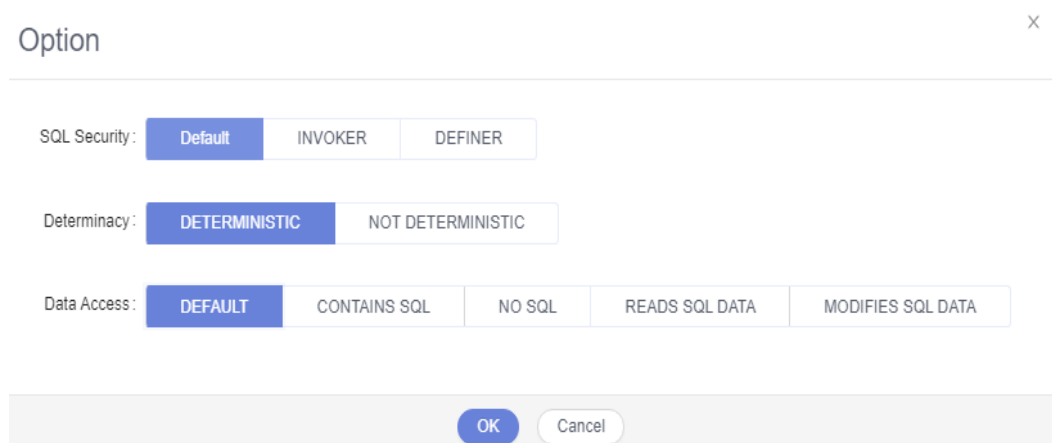
Step 7 On the **Objects** page, select **Functions**. In the right pane, locate the function you want to alter or execute and click **Alter or Execute** in the **Operation** column.

Figure 8-61 Altering or executing a function



Step 8 On the displayed page, click **Option** and set parameters as required. Then, click **Save** to save the settings or click **Execute**.

Figure 8-62 Altering a function



----End

8.8.3 Dropping a Function

This section describes how to drop a function that is no longer needed.

Precautions

Dropped functions cannot be recovered. Exercise caution when performing this operation.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)



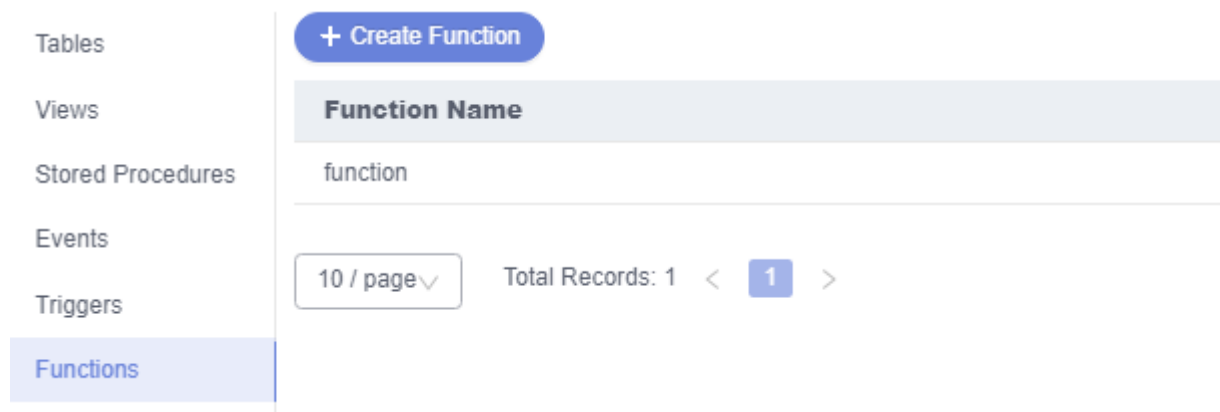
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the **Objects** page, select **Functions**. In the right pane, locate the function you want to drop and click **Drop** in the **Operation** column.

Figure 8-63 Dropping a function





- Step 8** In the displayed dialog box, click **Yes**.
----End

8.9 Trigger Management

8.9.1 Creating a Trigger

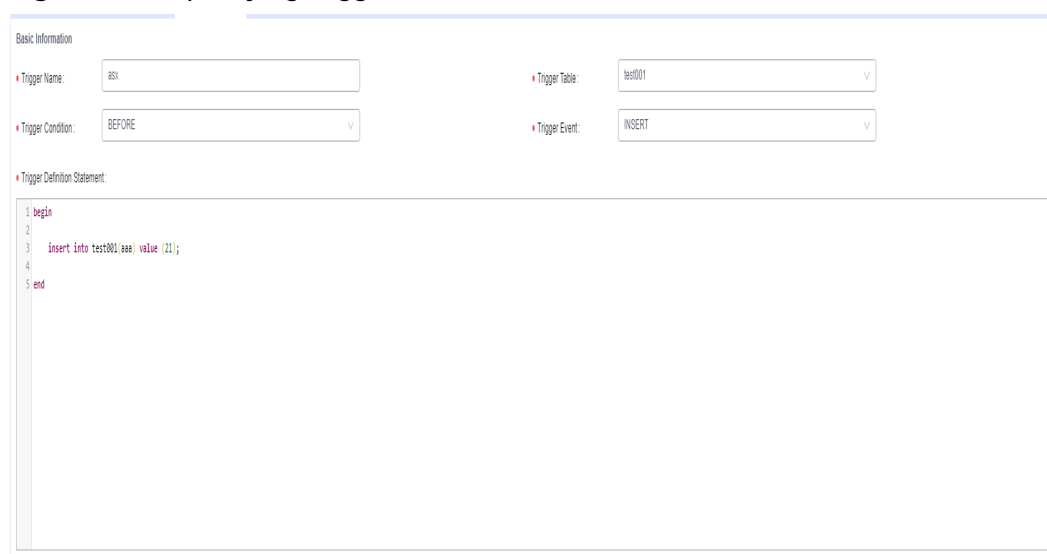
This section describes how to create a trigger on the DAS console. A trigger is a set of SQL statements stored in the database catalog. Whenever an event associated with a table occurs, a SQL trigger is executed or fired to insert, update, or delete data.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** page, choose **Triggers**. In the upper left corner of the page, click **Create Trigger**.
- Step 8** On the displayed page, set required parameters and edit trigger definition statements. Then, click **Create**.

Figure 8-64 Specifying trigger information



Basic Information

Trigger Name: test

Trigger Table: test001

Trigger Condition: BEFORE

Trigger Event: INSERT

Trigger Definition Statement:

```
1 begin
2
3 insert into test001(aaa) value (1);
4
5 end
```

- Step 9** In the displayed dialog box, click **Execute**.

----End



8.9.2 Altering a Trigger

This section describes how to alter the name, table, condition, and event of a trigger as well as the SQL statement for defining the trigger on the DAS console.

Usage Notes

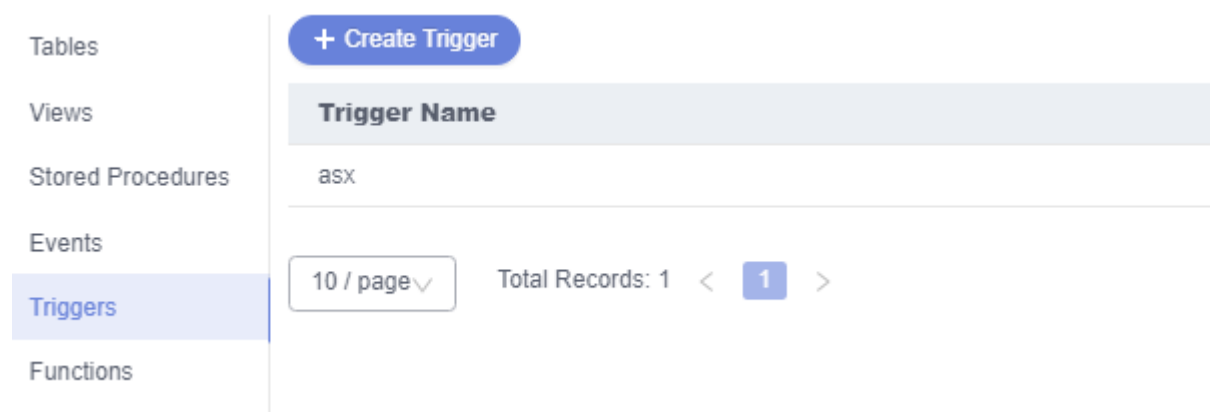
Improper alterations on a trigger will cause instance or service exceptions.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

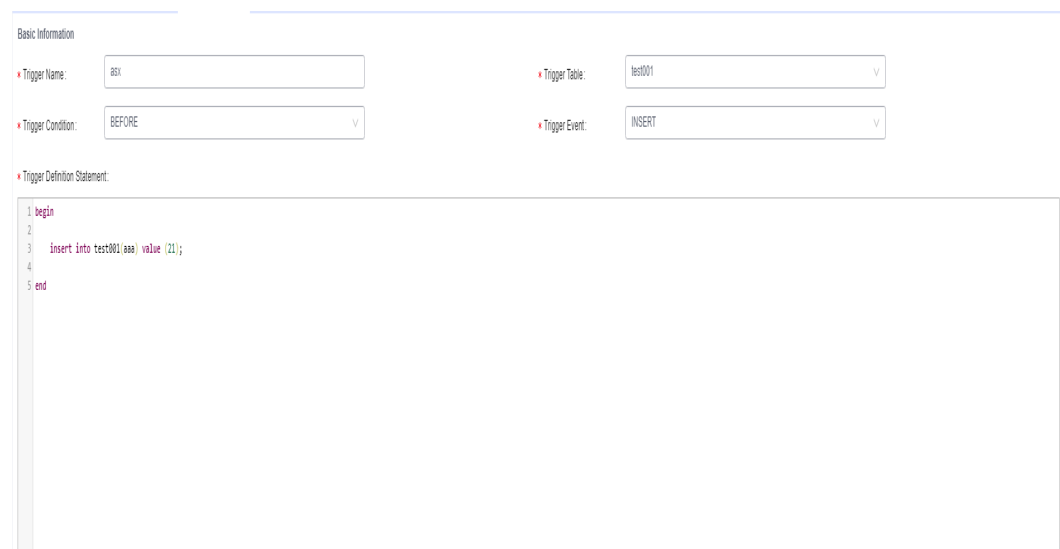
- Step 4** In the navigation pane on the left, choose **Development Tool**.
- You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** page, select **Triggers**. In the right pane, locate the trigger you want to alter and click **Alter** in the **Operation** column.

Figure 8-65 Altering a trigger



- Step 8** On the displayed page, modify the required parameters and click **Alter**.

Figure 8-66 Modifying trigger information



- Step 9** In the displayed dialog box, click **Execute**.

----End

8.9.3 Dropping a Trigger

This section describes how to drop a trigger that is no longer needed.

Precautions

Dropped triggers cannot be recovered. Exercise caution when performing this operation.

Procedure



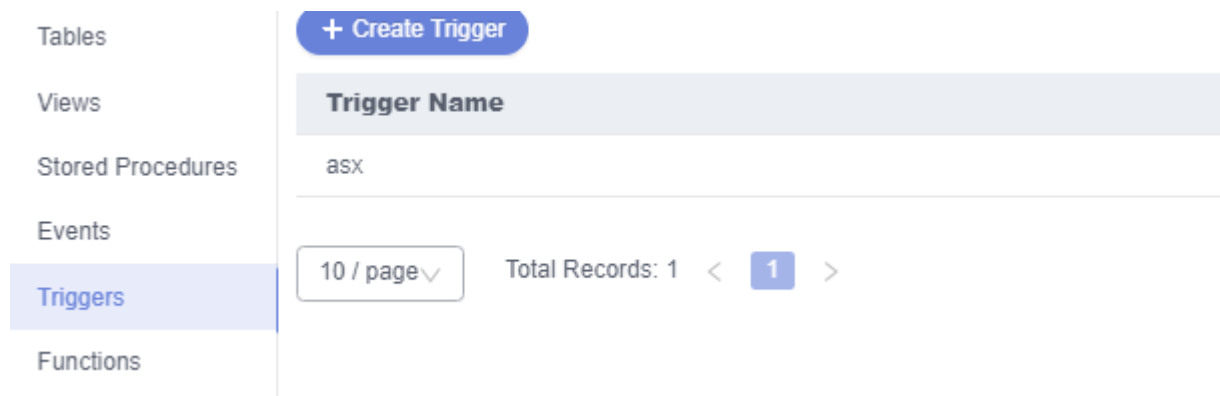
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** page, select **Triggers**. In the right pane, locate the trigger you want to drop and click **Drop Trigger** in the **Operation** column.

Figure 8-67 Dropping a trigger



- Step 8** In the displayed dialog box, click **Yes**.

----End

8.10 Data Import and Export

8.10.1 Importing Data

This section describes how to import data from your local PC or an OBS bucket for data backup and migration.


Usage Notes

- Import data into a table for backup or migration. If you import a CSV or SQL file, the file must have the same data type as the target table.
- Only one file that is no larger than 1 GB can be imported at a time.
- Only data files in the CSV or SQL format can be imported. If there are more than 100,000 instance tables, CSV cannot be used.
- Binary fields such as BINARY, VARBINARY, TINYBLOB, BLOB, MEDIUMBLOB, and LONGBLOB are not supported.
- The size of a single SQL statement to be imported must be less than 100 MB.
- If a SQL file containing binary data is exported using the mysqldump tool, the file cannot be imported.
- Only OBS buckets of the current IAM account can be imported.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Import**.

Step 7 Click **Create Task**.

Figure 8-68 Creating an import task

Create Task
×

Import Type

sql

CSV

File Source

Upload file

Choose from OBS

Attachment Storage ?

5257

▼

Bucket ACL Info

No OBS bucket? [Create OBS Bucket](#)

Creating an OBS bucket is free of charge, but storing files in it will incur fees.

Attachment

+

Click here to upload a file, or drag one here. (.sql)

Upload only one attachment that is no larger than 1 GB.

Database

prd

Charset

UTF8

GBK

Auto Detect

Options

Ignore errors, that is, skip the step where the SQL statement fails to be executed.

 Delete the uploaded file upon an import success.

Remarks

Create

Cancel

Table 8-9 Parameter description

Parameter	Description
Import Type	Set Import Type to sql or CSV .

Parameter	Description
File Source	<p>Import a file from your local PC or an OBS bucket.</p> <ul style="list-style-type: none"> Upload file If you select Upload file for File Source, you need to set Attachment Storage and upload the required file. To keep your data secure, provide your own OBS bucket to store the file you uploaded. In this way, DAS automatically connects to your OBS bucket for in-memory reading. No data is stored on DAS. Creating OBS buckets is free of charge, but saving files will incur certain costs. If you select Delete the uploaded file upon an import success, the file you uploaded will be automatically deleted from the OBS bucket after being imported to the destination database. Choose from OBS If you select Choose from OBS for File Source, you need to select a file from the bucket. The file uploaded from an OBS bucket will not be deleted upon an import success.
Attachment Storage	<p>Select an OBS bucket to store the file. Click Bucket ACL Info to check whether a public OBS bucket is selected.</p> <ul style="list-style-type: none"> SAFE: The bucket ACL permission set does not contain ALL USERS. WARN: The bucket ACL permission set contains ALL USERS. UNKNOWN: The bucket ACL permission set is unknown, maybe due to the lack of IAM permissions. You are advised to go to the OBS page to view the bucket ACL configuration.
Database	Select the database that you want to import the file to.
Charset	Select a charset as needed.
Options	<p>If you select Ignore errors, that is, skip the step where the SQL statement fails to be executed, the system will skip any errors detected when SQL statements are being executed.</p> <p>If you select Delete the uploaded file upon an import success, the file you uploaded will be automatically deleted from the OBS bucket after being imported to the destination database. This option is only available to the files uploaded from your local PC.</p>
Remarks	Enter remarks as required.

Step 8 After setting import parameters, click **Create**.

Confirm the information again before you click **OK** because original data may be overwritten after data import.

Step 9 On the displayed page, view import progress in the task list.

Click **Details** in the **Operation** column to view task details.

----End

8.10.2 Exporting Data

DAS allows you to export a large amount of data at a time to facilitate data query or to back up data for migration. This section describes how to export data.

DAS allows you to export an entire database, some data tables, or result sets of SQL statements.

Usage Notes

- If you do not select **Generate a file for each table** when exporting data, the exported data file is in **.zip** format. Data files in this format cannot be directly imported. You need to decompress the file before importing it again.
- If **Generate a file for each table** is selected during data export, the exported data file is in **.sql** or **.csv** format. In this case, the exported data file can be directly imported again.
- If you export over 100,000 instance tables by following [Exporting a Database](#), an error message will be displayed indicating that there are too many tables and data cannot be exported. In this case, perform steps in [Exporting SQL Results](#) instead.
- Only OBS buckets of the current IAM account can be exported.


Prerequisites

You have created a user database on the DAS console. For details, see [Creating a Database](#).

Exporting a Database

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

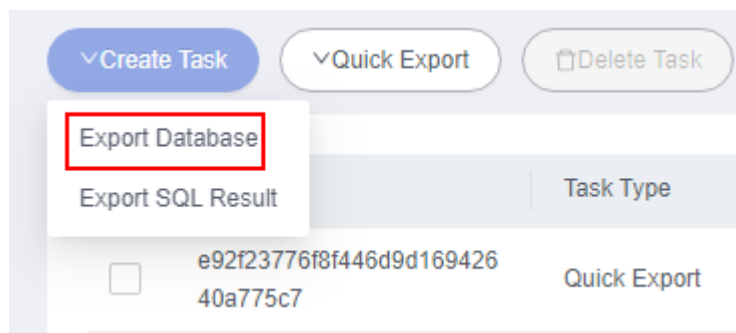
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

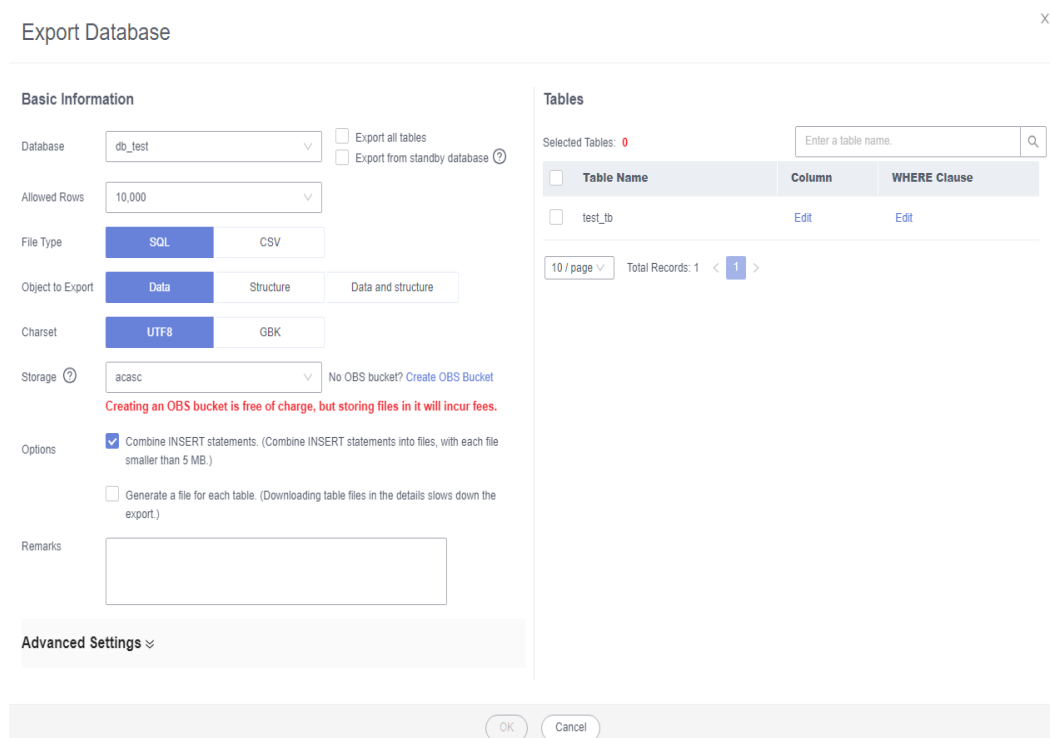
Step 7 In the upper left corner of the page, click **Create Task** and choose **Export Database**.

Figure 8-69 Creating a task for exporting a database



Step 8 In the displayed dialog box, configure basic information and advanced settings as required.

Figure 8-70 Creating a task for exporting a database



- If you select **Export all tables**, data in an entire database or in specific tables will be exported.
- Databases are classified into user databases and system databases. System database cannot be exported. If system database data is required, deploy system database services in a user database, so that you can export the system database data from the user database.
- DAS connects to your standby database to export data. This prevents the primary database from being affected by data export. However, if the standby database has a high replication delay, the exported data may not be the latest.
- DAS does not store any user data. The exported data files are stored in the OBS bucket that you have created. You can specify the storage path. You can

click **Bucket ACL Info** in the **Create Task** dialog box to check whether a public OBS bucket is selected.

- Creating OBS buckets is free of charge, but saving files will incur certain costs.

Step 9 After settings are complete, click **OK**.

Step 10 In the task list, locate the created task and view the task ID, type, status, and progress.

Step 11 Click **Details** in the **Operation** column to view task details.

Figure 8-71 Task list


Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
4541463a2146b7b20584 c430209140	Database	db_test	2023-07-14 10:4 2:10	2023-07-14 10:4 2:11	260.89 KB	SQL	Successful	1 second	10000	100%		Details Download
#920237780464098169426 4ba775c7	Quick Export	db_test	2023-07-14 10:3 9:20	2023-07-14 10:3 9:21	1.61 MB	SQL	Successful	1 second	100000	100%		Details Download

----End

Exporting SQL Results

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

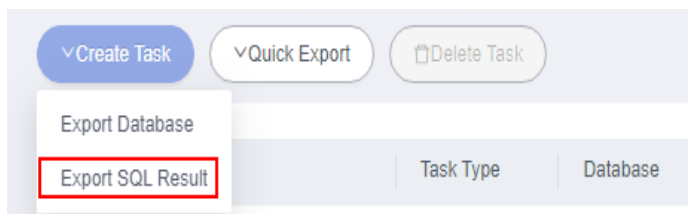
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

Step 7 In the upper left corner of the page, click **Create Task** and choose **Export SQL Result**.

Figure 8-72 Creating a task for exporting SQL results



Step 8 In the displayed dialog box, configure basic information and advanced settings as required.

Figure 8-73 Creating a task for exporting SQL results

Export SQL Result X

Basic Information

Database: Export from standby database ?

Allowed Rows:

File Type:

Charset:

Storage ?: No OBS bucket? [Create Bucket](#)

Creating an OBS bucket is free of charge, but storing files in it will incur fees.

Options

Combine INSERT statements. (Combine INSERT statements into files, with each file smaller than 5 MB.)

Generate one file for each result.

SQL to Execute:

Remarks:

Advanced Settings ∨

- In a SQL result export task, the executed SQL statements cannot exceed 5 MB.
- To export multiple SQL result sets at a time, enter SQL statements in the SQL text box. Enter each SQL statement on a separate line and add a semicolon (;) at the end. After the export task is complete, SQL files are generated. One SQL statement corresponds to one file.
- DAS does not store any user data. The exported data files are stored in the OBS bucket that you have created.
- You can click **Bucket ACL Info** in the **Create Task** dialog box to check whether a public OBS bucket is selected.
- Creating OBS buckets is free of charge, but saving files will incur certain costs.

Step 9 After settings are complete, click **OK**.

Step 10 In the task list, locate the created task and view the task ID, type, status, and progress.

Step 11 Click **Details** in the **Operation** column to view task details.

Figure 8-74 Task list

Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
<input type="checkbox"/> 0f0c377020b84b3d055110073b10401004	SQL Result	db_test	2023-07-14 10:4 8:30	2023-07-14 10:4 8:30	200.84 KB	SQL Result	Successful	1 second	10000	100%		Details Download
<input type="checkbox"/> 415c4184302183470201041443020104	Database	db_test	2023-07-14 10:4 2:30	2023-07-14 10:4 2:31	200.89 KB	SQL	Successful	1 second	10000	100%		Details Download
<input type="checkbox"/> 40202770b84b3d055110073b10401004	Quick Export	db_test	2023-07-14 10:3 8:20	2023-07-14 10:3 8:21	1.41 MB	SQL	Successful	1 second	100000	100%		Details Download

----End

Downloading Data Files


Data exported using the data export function is stored in the OBS bucket you created. You can download exported data files in any of the following ways:

- Download on the DAS Console.
- Download on the OBS management console.

Quick Export (Not Promoted)

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

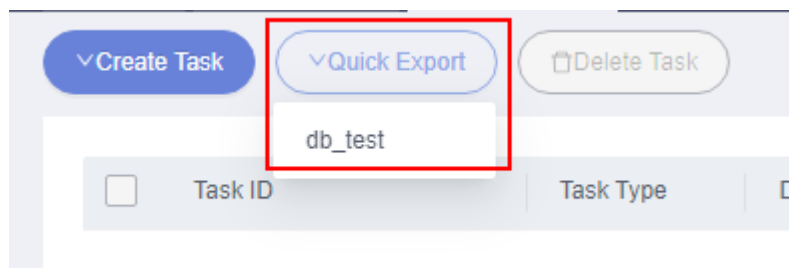
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

Step 7 In the upper left corner of the page, click **Quick Export** and select the database that you want to export data from.

Figure 8-75 Quick export

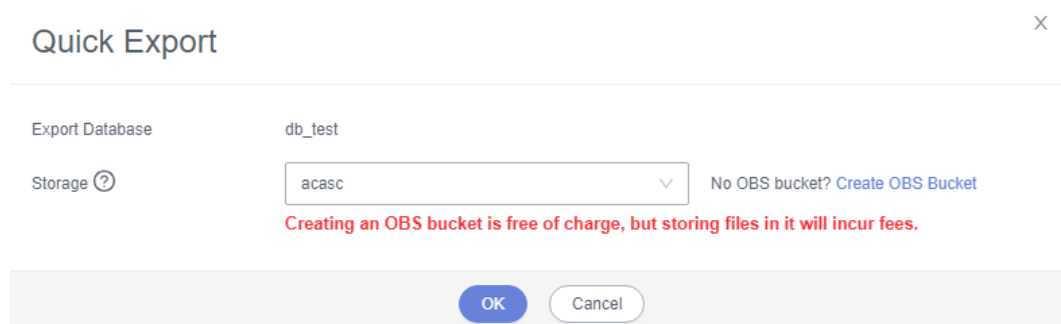


NOTE

A maximum of 200,000 rows can be quickly exported from a single table. To export more data, choose **Create Task > Export Database**.

Step 8 On the **Quick Export** page, select a storage path and click **OK**.

Figure 8-76 Quick export



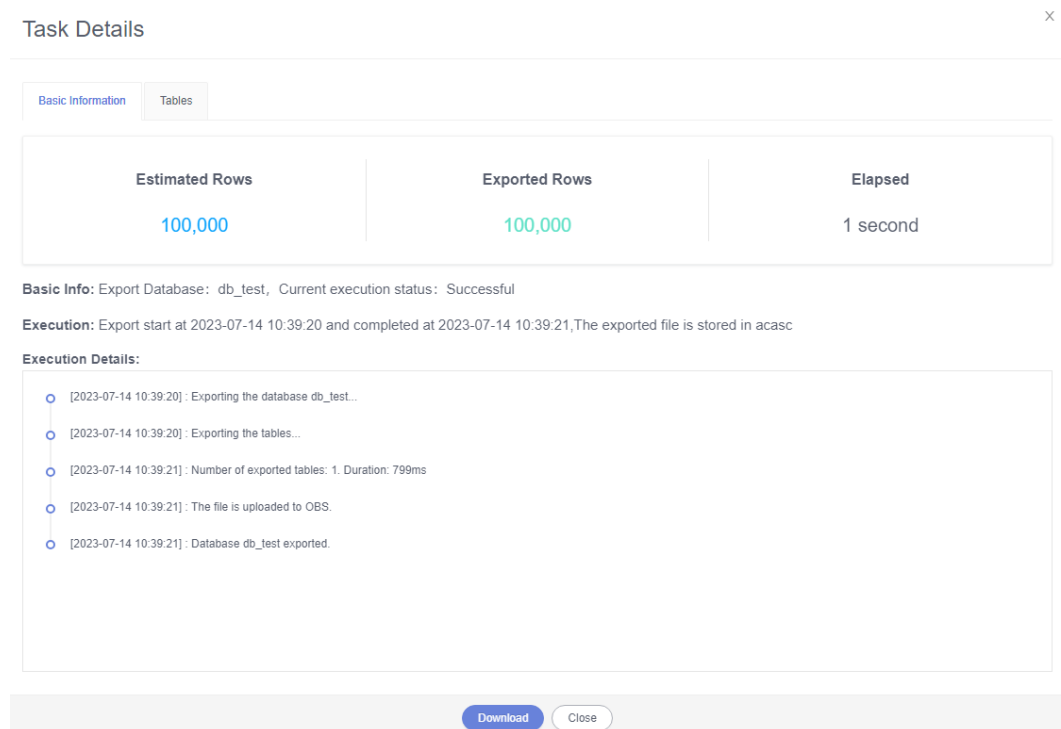
Step 9 In the task list, view the export task you created.

Figure 8-77 Task list

Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Time	Exported Rows	Progress	Remarks	Operation
69223775844692169426 42x776d	Quick Export	db_test	2023-07-14 10:3 9:20	2023-07-14 10:3 9:21	1.61 MB	SQL	Successful	1 second	100000	100%		Details Download

In the row that contains the export task, you can click **Details** in the **Operation** column to view execution details of the task and information about exported tables.

Figure 8-78 Task details



----End

8.11 Data Generator (Not Promoted)

DAS can automatically generate test data according to certain rules. This test data can be inserted into a database to test program functions. This section describes how to generate test data according to the predefined rules.

Procedure



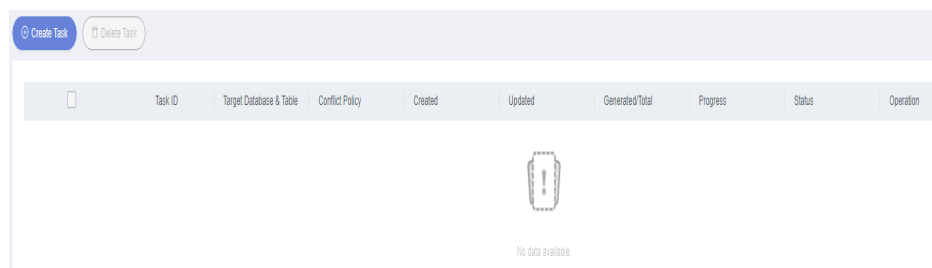
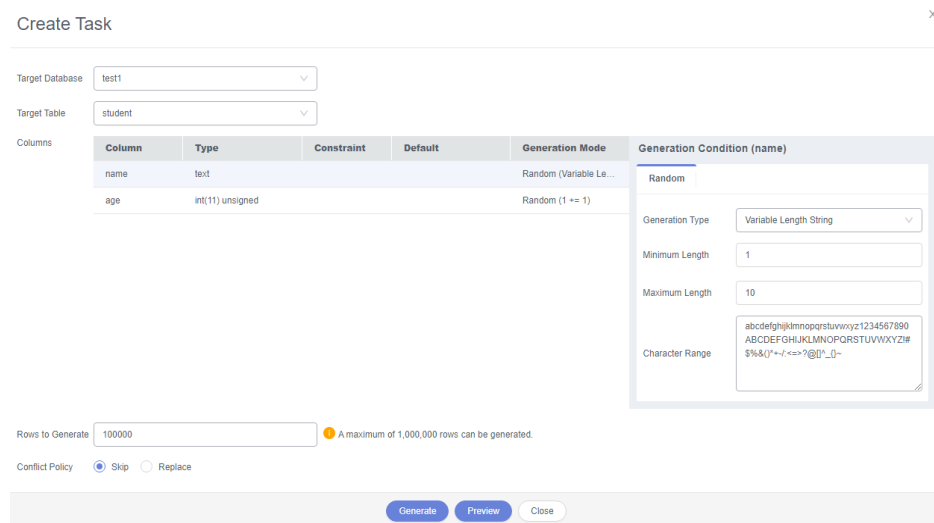
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Data Scheme > Data Generator**.
- Step 7** On the displayed page, click **Create Task**.

Figure 8-79 Creating a data generation task



- Step 8** In the displayed dialog box, configure required parameters.

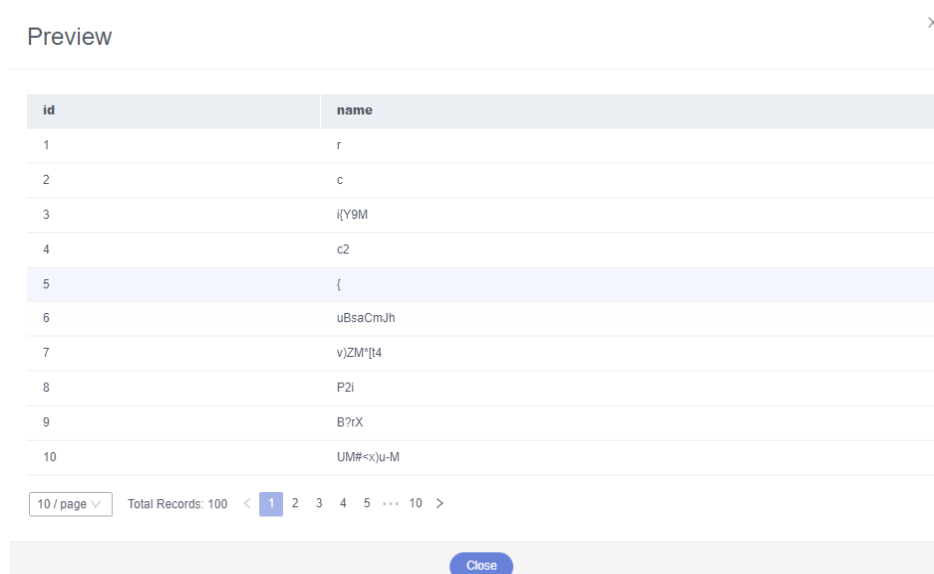
Figure 8-80 Configuring task parameters



- **Rows to Generate**
A maximum of 1,000,000 rows of data can be generated.
- **Conflict Policy**
If you select **Skip**, the system skips data rows in conflict and continues generating data. If you select **Replace**, the system replaces existing rows with new ones that have the same primary key.
- **Generation Mode**
On the **Create Task** page, double-click one column you want to select. Set rules for generating data randomly based on the column information. For example, if the column name is **time**, you need to specify start and end time and the generation format. Alternatively, select **Based on current time**.

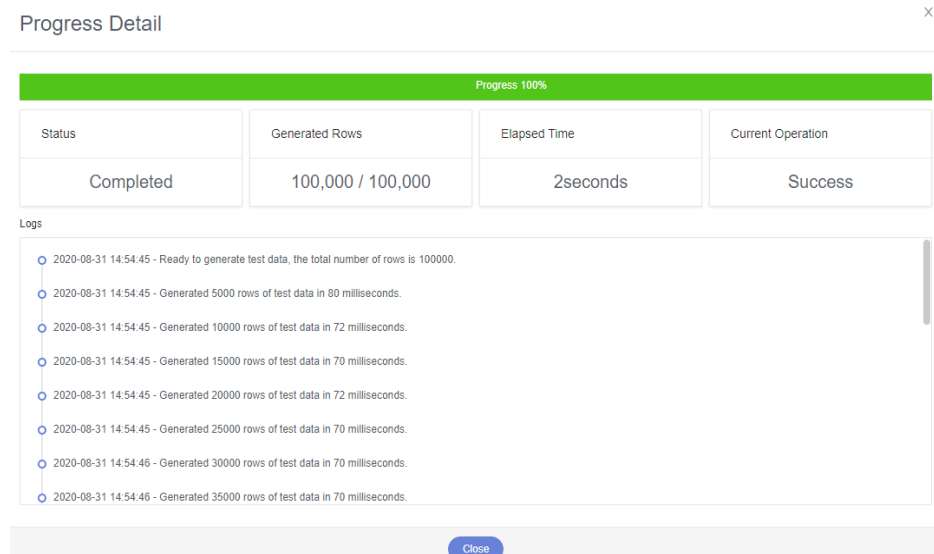
Step 9 Click **Preview** to check whether the data that will be generated can meet your requirements. If not, adjust the generation rules.

Figure 8-81 Data preview



Step 10 Click **Generate**.

Figure 8-82 Test data generation progress



Step 11 In the task list, locate the created task and click **Details**.

You can also delete the task as required.

Figure 8-83 Task list

Task ID	Target Database & Table	Conflict Policy	Created	Updated	Generated/Total	Progress	Status	Operation
1326	'test1'.'student'	ignore	2020-08-31 14:54:45	2020-08-31 14:54:47	100,000/100,000	100%	Completed	Details Open Table SQL Window
1325	'test1'.'student'	ignore	2020-08-31 14:52:23	2020-08-31 14:52:23	100/100	100%	Completed	Details Open Table SQL Window
1324	'test1'.'student'	ignore	2020-08-31 14:52:15	2020-08-31 14:52:15	1,000/1,000	100%	Completed	Details Open Table SQL Window
1323	'test1'.'student'	ignore	2020-08-31 14:50:32	2020-08-31 14:50:32	1,000/1,000	100%	Completed	Details Open Table SQL Window

----End

8.12 Task Management

8.12.1 Task Scheduling

Currently, this function is not supported. To use this function, set **event_scheduler** to **ON**. For details, see [Event Management](#).

8.12.2 Scheduled Backup (Not Promoted)


Scheduled backup allows you to periodically back up important database tables and data or SQL result sets so that data can be restored timely in case of data loss.

Configuring the AK/SK

Configure AK and SK before you periodically back up database tables or SQL result sets.

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

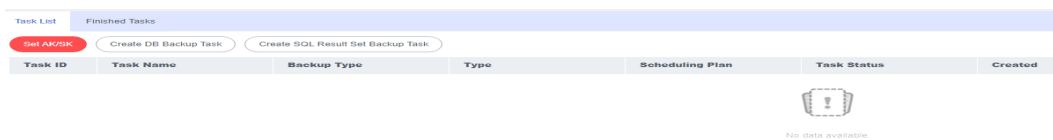
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Background Tasks > Scheduled Backup**.

Step 7 On the **Task List** tab, click **Set AK/SK** in the upper left corner.

Figure 8-84 Configuring the AK/SK



Step 8 In the displayed dialog box, specify **Storage**, enter an AK and SK, and click **Test AK/SK**. After the test succeeds, click **OK**.

Figure 8-85 Configuring AK/SK information

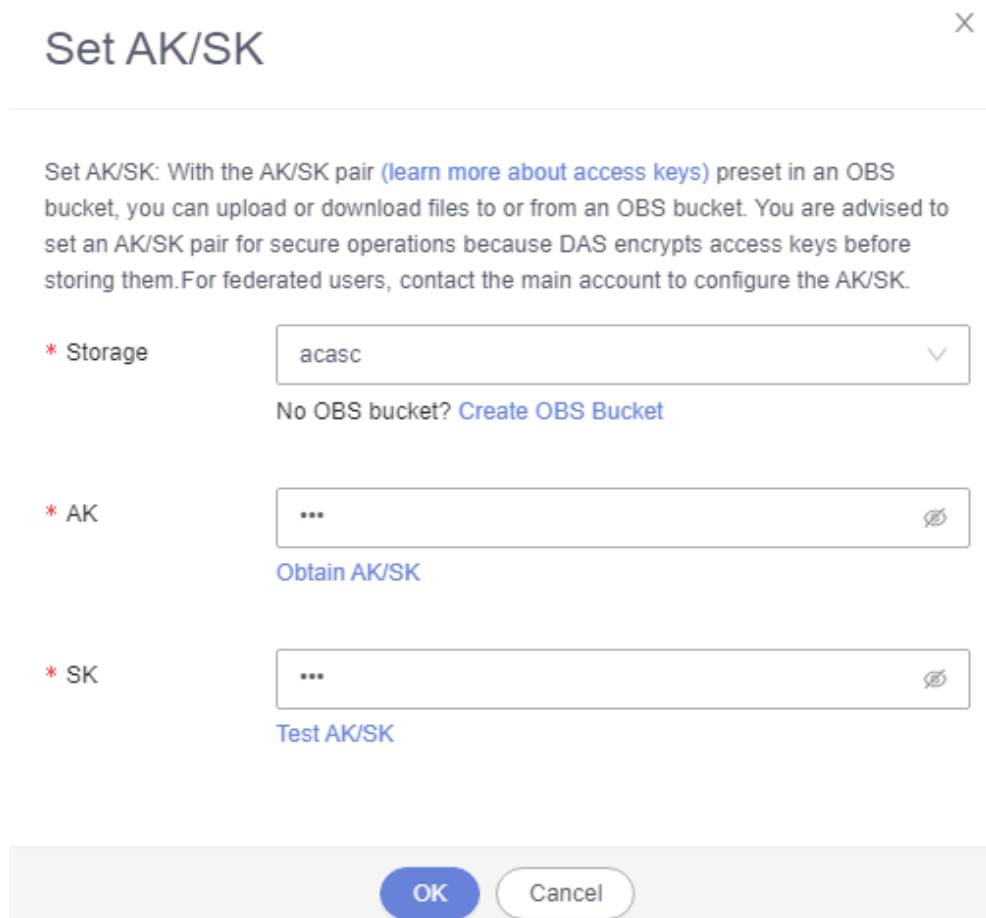


Table 8-10 Parameter description

Parameter	Description
Storage	The system stores encrypted files in OBS buckets.
AK and SK	AK and SK : Access key ID (AK) and secret access key (SK) are required credentials for you to access Huawei cloud services using development tools like APIs, CLI, and SDKs. The system uses AKs to identify users and SKs to verify encrypted signatures, ensuring that requests are secret, complete, and correct.

----End

Creating a DB Backup Task

Step 1 On the **Task List** page, click **Create DB Backup Task**.

Figure 8-86 Creating a DB backup task

Task ID	Task Name	Backup Type	Type	Scheduling Plan	Task Status	Created	Operation
212	test-task	Database backup	Scheduled	2023-07-14 16:27:02	Scheduling	2023-07-14 16:27:11	Details View Execution Records Terminate Pause

Step 2 Enter a task name, select a task type, backup file format, database, and storage path, and enter remarks.

Figure 8-87 Page for creating a database backup task

Create DB Backup Task

* Task Name: test-task

Task Type: Scheduled Backup Periodic backup

* Execution Time: Select date

Backup File Format: SQL CSV

* Database: [Dropdown menu]

Back Up from Standby DB
 Back up all the tables in the database

* Storage: acasc

No OBS bucket? [Create OBS Bucket](#)

Remarks: Enter a maximum of 500 characters.

Tables: Selected Tables: 0. Enter a table name.

OK Cancel

Step 3 Confirm the settings and click **OK**.

Step 4 View that the status of the current backup task is **Scheduling** in the task list.

You can also view task details and execution records and terminate or pause the task.

Figure 8-88 Viewing backup tasks

Task ID	Task Name	Backup Type	Type	Scheduling Plan	Task Status	Created	Operation
212	test-task	Database backup	Scheduled	2023-07-14 16:27:02	Scheduling	2023-07-14 16:27:11	Details View Execution Records Terminate Pause

- You can click **Details** to view backup logs.
- You can click **View Execution Records** to view the backup status.
- You can click **Terminate** to end the backup task.
- You can click **Pause** suspend the backup task.

You can also click **Download** to download backup data.

Figure 8-89 Downloading backup data

Task ID	Backup Type	Database	Started	End Time	Backup Status	Operation
c74d51fe05314c47b828bd182e6d9727	Database backup	db_test	2023-07-14 16:31:30	2023-07-14 16:31:33	Successful	Details Download

----End

Creating a SQL Result Set Backup Task

- Step 1** On the task list tab, click **Create SQL Result Set Backup Task**.
- Step 2** Enter a task name, select a task type, backup file format, database, and storage path, and enter SQL statements to be executed and remarks.

Figure 8-90 Creating a SQL result set backup task

Create SQL Result Set Backup Task

* Task Name

Task Type Scheduled Backup Periodic backup

* Execution Time

Backup File Format SQL_Insert CSV

* Database ▼
 Back Up from Standby DB

* Storage ▼
No OBS bucket? [Create OBS Bucket](#)

* SQL to Execute

Remarks

- Step 3** Confirm the settings and click **OK**.
- Step 4** View that the status of the current backup task is **Scheduling** in the task list.
 You can also view details and execution records and terminate or suspend a scheduling task.

Figure 8-91 Viewing backup tasks

Task ID	Task Name	Backup Type	Type	Scheduling Plan	Task Status	Created	Operation
214	task	SQL result set backup	Scheduled	2023-07-14 16:32:19	Scheduling	2023-07-14 16:34:01	Details View Execution Records Terminate Pause

- You can click **Details** to view backup logs.
- You can click **View Execution Records** to view the backup status.
- You can click **Terminate** to end the backup task.
- You can click **Pause** suspend the backup task.

You can also click **Download** to download backup data.

Figure 8-92 Downloading backup data

Task ID	Backup Type	Database	Started	End Time	Backup Status	Operation
70aeb030c5784b38b7244c7e75872250	SQL result set backup	db_test	2023-07-14 16:34:05	2023-07-14 16:34:06		Details Download

----End

8.13 Table Structure Comparison and Synchronization (Not Promoted)

This section describes how to check the structure difference by comparing and synchronizing table structures when you perform a migration or verification.



Prerequisites

To create a table structure comparison and synchronization task, you need to toggle on **Save SQL** first so that DAS can store your data. If you do not toggle on **Save SQL**, you cannot create table structure comparison and synchronization tasks.

Figure 8-93 Enabling the function of saving SQL statements

Task ID	Base Object	Target Object	Created	Sync Type	Status	Comparison Status	Sync Status	Operation
<div style="text-align: right;">Save SQL (recommended) <input checked="" type="checkbox"/></div>								

Procedure

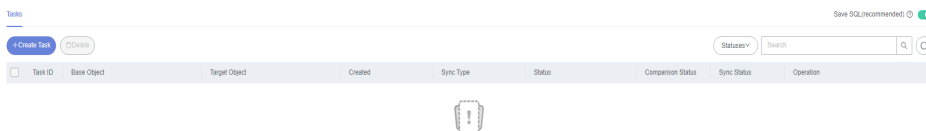
- Step 1** Log in to the Huawei Cloud console.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Structure Management > Table Structure Comparison and Synchronization**.

Search for tasks by task status and view task details.

Figure 8-94 Structure management



Step 7 On the displayed page, click **Create Task** in the upper left corner.

Step 8 On the displayed page, specify the source database, target instance, target database, error tolerance, and synchronization type. Click **Next**.

Figure 8-95 Creating a task

Source Instance: gauss-9f08 (root)

Source Database: table

Target Instance: Current instance Another instance

Target Database:

Error Tolerance: Skip comparison error Skip sync error

Sync Type: Global Specified One-to-one One-to-more ?

Global: synchronizes all the databases with duplicate names to the target database.

Step 9 View comparison objects and click **Compare**.

Step 10 View the comparison progress. In the comparison item list, click **View Logs** in the **Operation** column to obtain comparison details. You can also click **Download DDL** as needed.

Figure 8-96 Viewing logs

Source Instance: gauss-9f08(root) Source Database: test Sync Type: Global

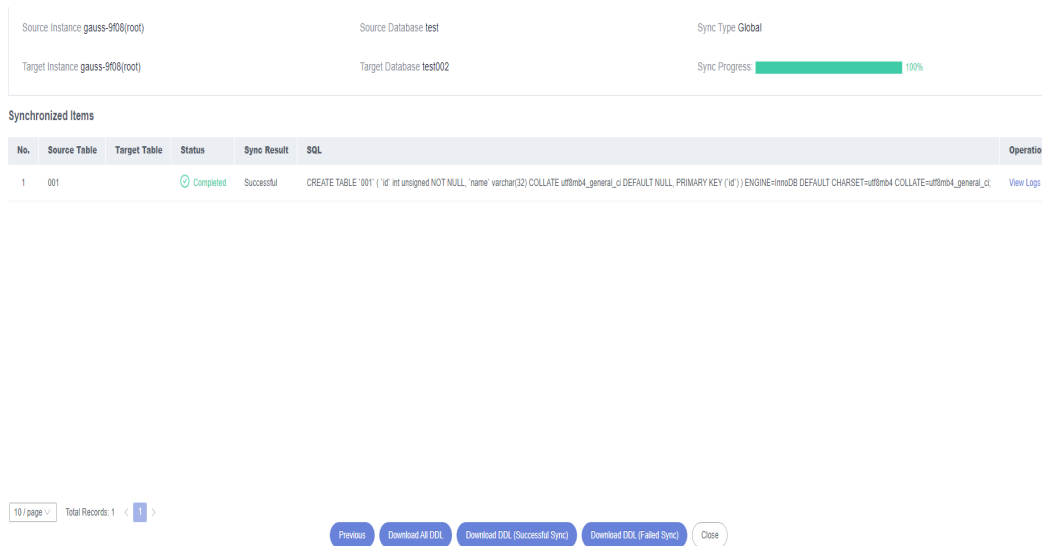
Target Instance: gauss-9f08(root) Target Database: test002 Comparison Progress: 100%

Compared Items: Error (0) Create (1) Alter(0) Drop (0) Same (0)

No.	Source Table	Target Table	Status	Comparison Result	SQL	Op
1	001		Completed	CREATE	CREATE TABLE '001' ('id' int unsigned NOT NULL, 'name' varchar(32) COLLATE utf8mb4_general_ci DEFAULT NULL, PRIMARY KEY ('id')) ENGINE=innodb DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci	View

- Step 11** Click **Next**. On the **Synchronize** page, view basic information about this comparison task, such as the source instance, source database, target instance, target database, and synchronization type, and specify the items to be synchronized.
- Step 12** Skip synchronization items that may cause high risks and click **Synchronize**.

Figure 8-97 Synchronizing items



- Step 13** After synchronization is complete, click **View Logs** in the **Operation** column to obtain comparison details. You can download DDL as required.

----End

8.14 Intelligent O&M

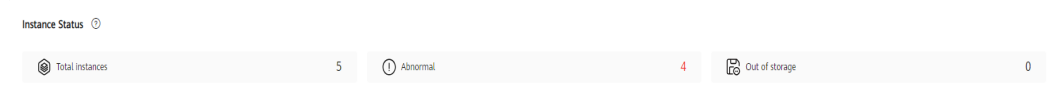
8.14.1 Dashboard

Dashboard helps you get knowledge of overall information about your instances, including instances by status, engine distribution, active alarms, slow query logs, monitoring dashboard, and resource risky instances. Intelligent Diagnosis checks instance health using instance operation data and intelligent algorithms and provides diagnosis results and suggestions.

Viewing the Instance Status

You can view the number of instances by status in the current region, including primary instances and read replicas.

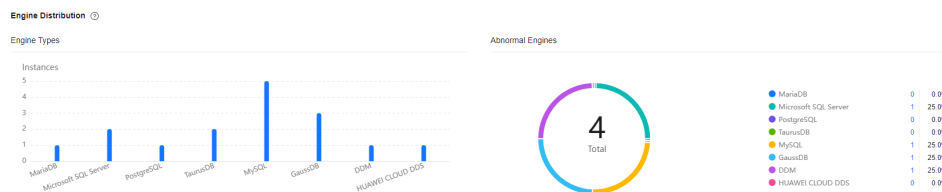
Figure 8-98 Instance status



Viewing Engine Distribution

You can view the distribution of engines in the current region, including engine types and abnormal engines.

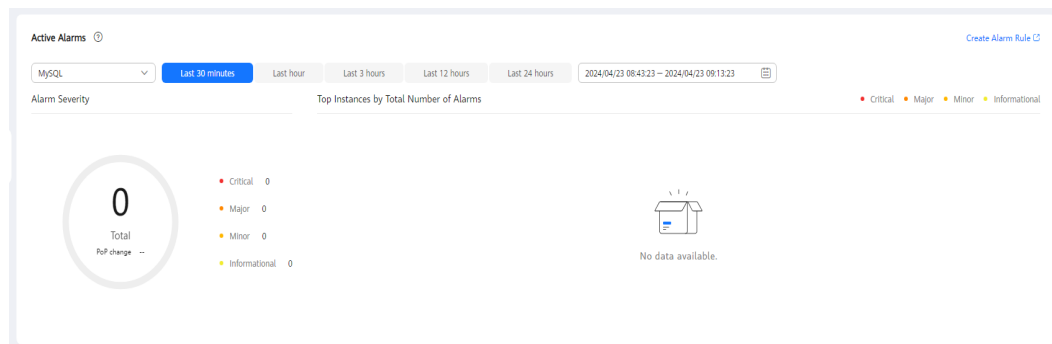
Figure 8-99 Engine distribution



Querying Active Alarms

You can view active alarms of all instances in the current region, including alarms in the Alarm (metric) and Triggered (event) statuses.

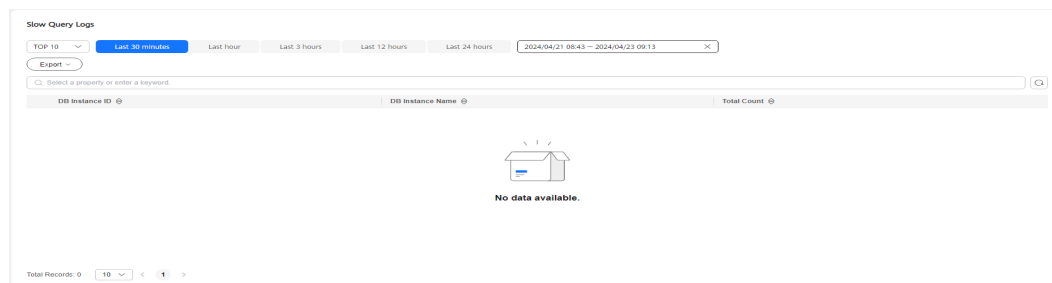
Figure 8-100 Active alarms



Viewing Slow Query Logs

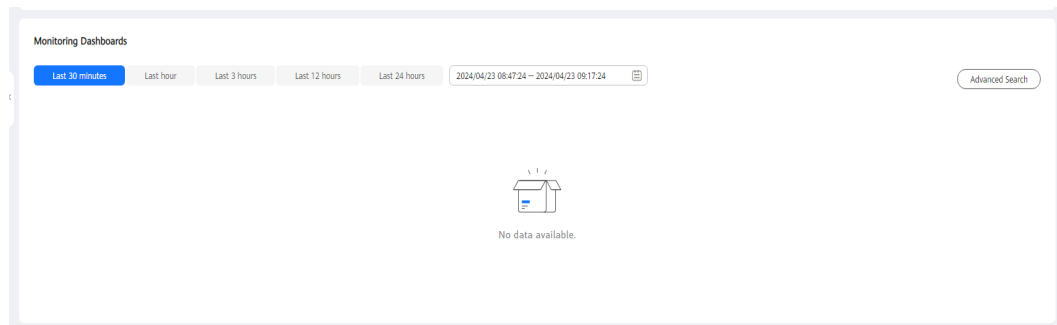
You can view the number of slow query logs of all instances in the current region.

Figure 8-101 Slow query logs



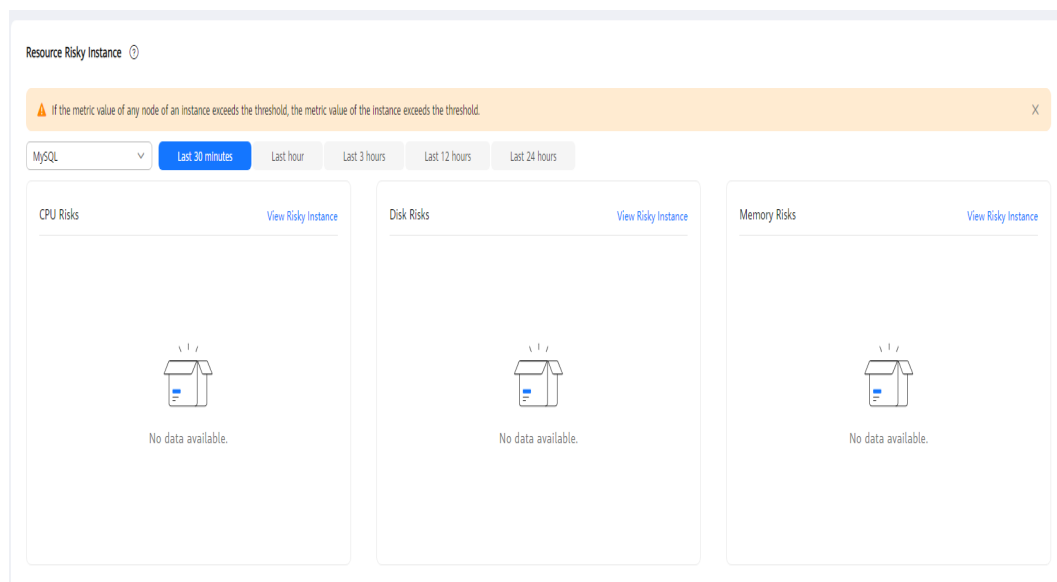
Monitoring Dashboards

You can view metrics of all instances in the current region.

Figure 8-102 Monitoring dashboards

Viewing Resource Risky Instances

You can view metric risks of all instances in the current region.

Figure 8-103 Resource risky instances

8.14.2 Setting an Instance as Paid

Intelligent O&M is available for paid and free instances. Paid instances can enjoy more value-added functions.

For details about instance billing policies, see [Intelligent O&M Billing](#).

If you want to set an instance as paid, go to [Setting an Instance as Paid](#).


If you want to set more than one instance as paid, go to [Setting Instances as Paid](#).

If you want to set your instances as free instances, see [Setting a Paid Instance as Free](#).

Setting an Instance as Paid

Step 1 [Log in to the Huawei Cloud console.](#)

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

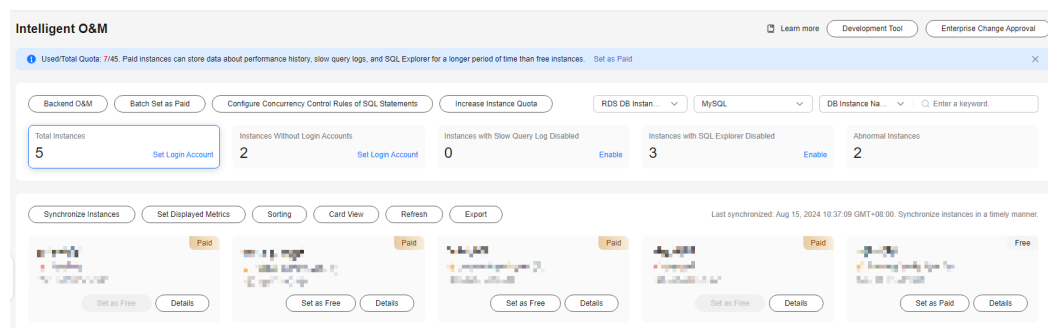
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 8-104 Searching for instances



Step 6 Select the instance that you want to set as paid and click **Set as Paid**.

Step 7 Carefully read the information displayed in the dialog box and click **OK**.


Step 8 On the **Instance List** page, check whether the instance status changes to **Paid**.

----End

Setting Instances as Paid

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 On the displayed page, click **Batch Set as Paid** or **Set as Paid**.

Step 6 Carefully read the information displayed in the dialog box, select the instances that you want to set as paid, and click **OK**.


Step 7 On the **Instance List** page, check whether the instance status changes to **Paid**.

----End

Setting a Paid Instance as Free

Step 1 [Log in to the Huawei Cloud console.](#)

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

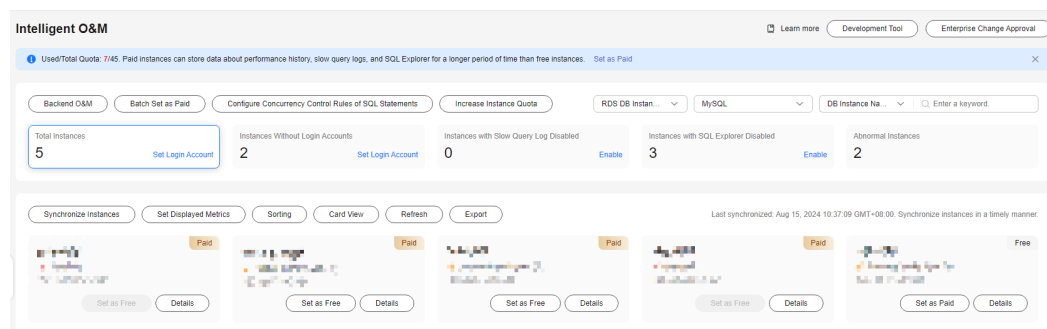
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 8-105 Searching for instances



Step 6 Locate the instance that you want to set as free and click **Set as Free** on the **Instance Overview** page.

Step 7 Carefully read the information displayed in the dialog box and click **OK**.

- If an instance is set as paid, you have to wait 5 minutes before it can be changed back to free.
- On the **Instance List** page, check whether the instance status changes to **Free**.

----End

8.14.3 Performance

8.14.3.1 Performance History

This section describes how to use the performance history function to view the running status of an instance in a specified period.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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


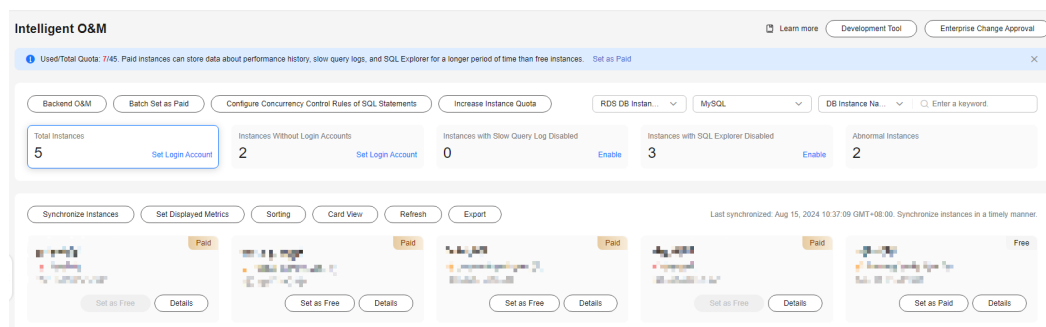
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M** > **Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 8-106 Searching for instances



- Step 6** Locate the target instance and click **Details**.
- Step 7** On the displayed page, choose **Performance** > **Performance History**.
- Select a node whose performance metrics you want to view.
 - Click **Select Metric**, select the metrics to display, and click **OK**.
Set a time range in the upper right corner so that you can view the node performance during this period. You can also click **Detail** on each metric performance graph to set a time range.
 - Enable **Interactive Graph** to view other metrics at the same time.

----End

8.14.3.2 Real-Time Performance

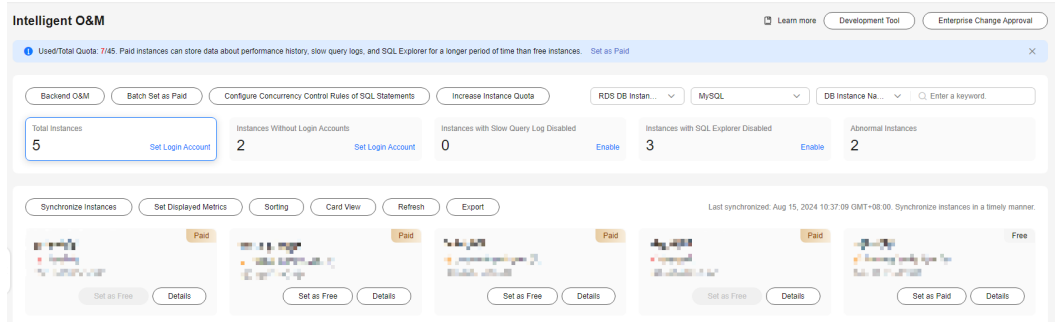
The **Real-Time Performance** tab displays key metrics of your instance and allows you to compare performance of your instance by date, helping you keep track of changes of your periodic services and metrics and detect exceptions.

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** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M** > **Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 8-107 Searching for instances

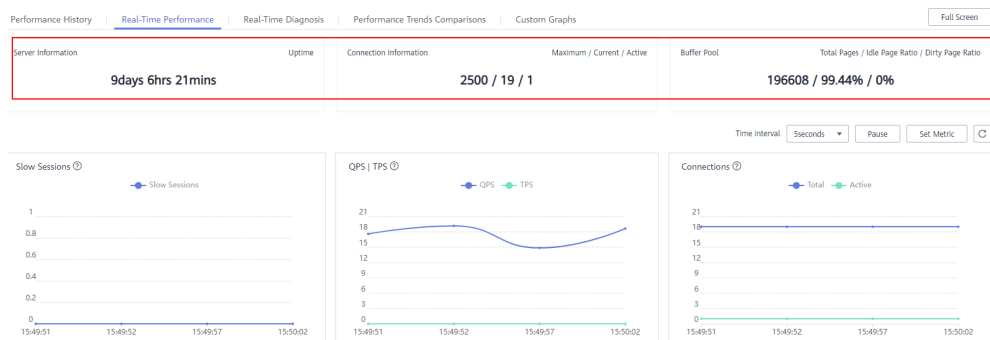


Step 6 Locate the instance whose real-time performance you want to view and click **Details**.

Step 7 Choose **Performance > Real-Time Performance**.

- View the server uptime, connection information, and buffer pool information.

Figure 8-108 Viewing server information



- Click **Set Metric**, select the metrics to display, and click **OK**.

Figure 8-109 Setting performance metrics

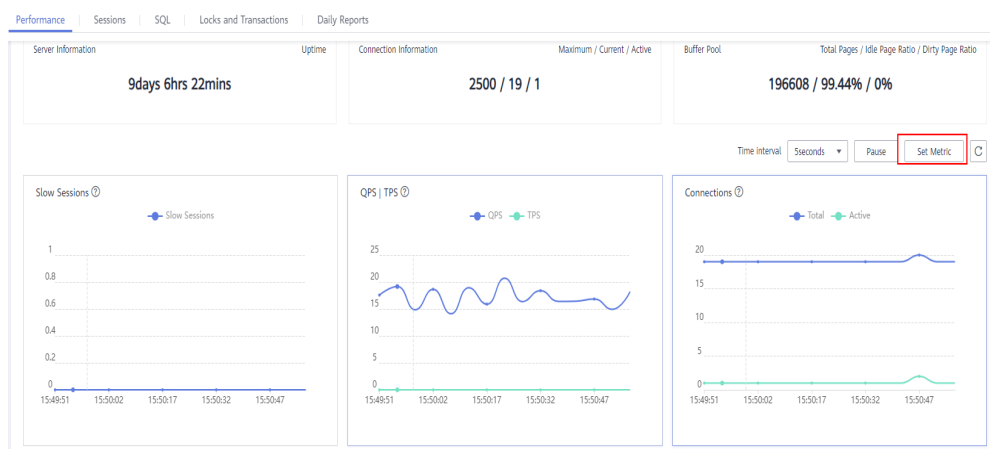


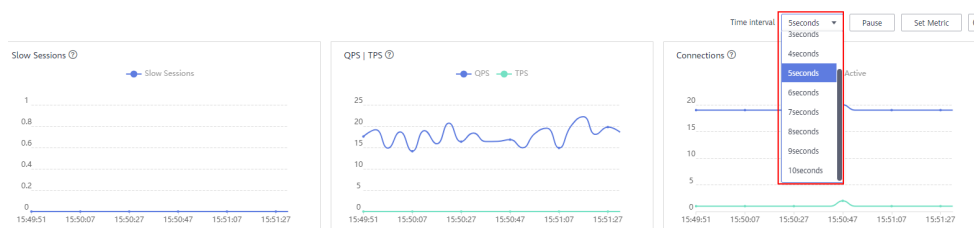
Table 8-11 Real-time performance metrics

Metric	Description
Slow Sessions	[Slow Session] Number of new slow sessions.
QPS TPS	QPS: SQL statement executions per second. TPS: Transactions executed per second.
Connections	Total: Number of enabled connections. Active: Number of active connections.
DML Executions	select: SELECT statement executions per second. insert: INSERT statement executions per second. update: UPDATE statement executions per second. delete: DELETE statement executions per second. insert_select: INSERT and QUERY statement executions per second.
InnoDB Cache	Cache Hit Ratio: Measures how many content requests a cache can deliver successfully from its cache storage, compared to how many requests it receives. Cache Usage: Cache usage.
InnoDB Accessed Rows	rows_read: Rows read from an InnoDB storage engine table. rows_inserted: Rows inserted into an InnoDB storage engine table. rows_updated: Rows written from an InnoDB storage engine table. rows_deleted: Rows deleted from an InnoDB storage engine table.
Logical Reads Physical Reads	Logic Reads: Logical reads per second. Physical Reads: Physical reads per second.
InnoDB Average Row Lock Duration (ms)	Average lock time of InnoDB row locks. The unit is ms.
InnoDB Row Lock Waits	Average InnoDB Row Lock Waits: Average waits of InnoDB row locks. Current InnoDB Row Lock Waits: Current waits of InnoDB row locks.
Temporary Tables Files	Temporary tables: Temporary tables automatically created when SQL statements are executed. Temporary files: Temporary files automatically created when SQL statements are executed.

Metric	Description
Network Traffic	<p>Total: Total incoming and outgoing traffic of an instance.</p> <p>Incoming: Incoming traffic of an instance.</p> <p>Outgoing: Outgoing traffic of an instance.</p>

- Adjust the time interval of collecting metrics. The interval ranges from 1 to 10 seconds.

Figure 8-110 Adjusting the time interval of collecting metrics



- Pause or start the real-time performance function based on service requirements.

Figure 8-111 Pausing or starting the real-time performance function





----End

8.14.3.3 Real-Time Diagnosis

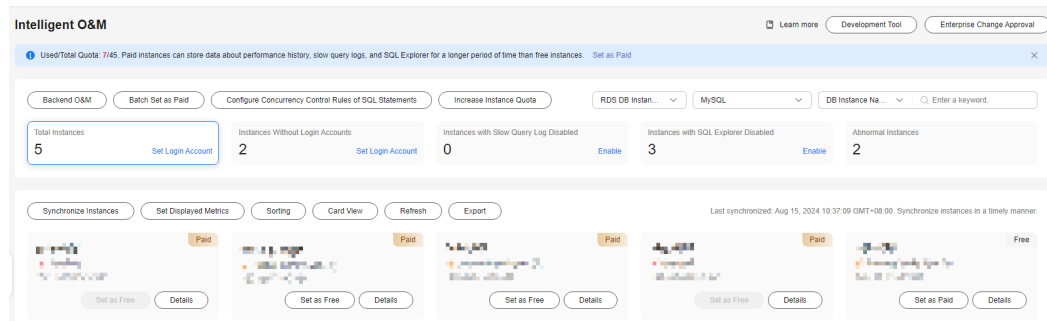
DAS allows you to use the real-time diagnosis function to view overall performance of your instance and identify exceptions quickly.

Procedure

- Step 1** Log in to the Huawei Cloud console.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M** > **Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

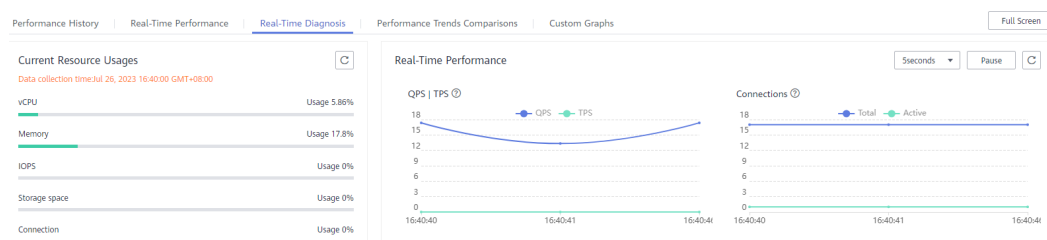
Figure 8-112 Searching for instances



Step 6 Locate the instance whose real-time diagnosis details you want to view and click **Details**.

Step 7 Choose **Performance > Real-Time Diagnosis**.

Step 8 View CPU, memory, IOPS, storage space, and connection usages of your instance.



----End


8.14.3.4 Performance Trends Comparisons

DAS allows you to use the performance trends comparison function to view performance trends of your instance within the same time range on different days for comparison and analysis.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

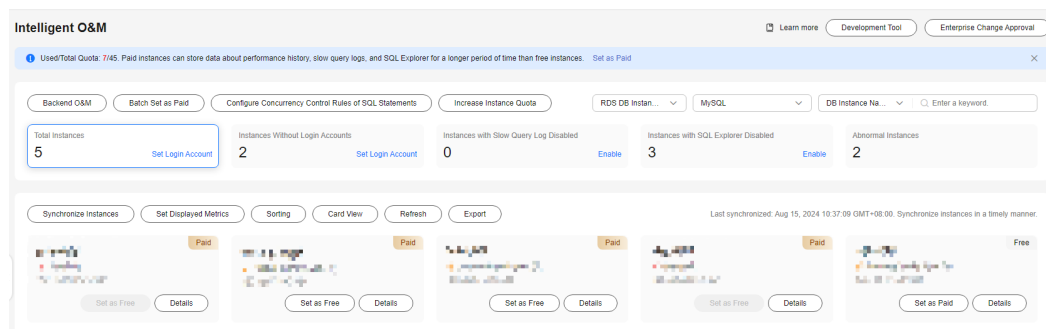
Step 2 Click  in the upper left corner and select a region and project.

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 8-113 Searching for instances

Step 6 Locate the target instance and click **Details**.

Step 7 Choose **Performance > Performance Trends Comparisons**.

- Select a node whose performance trends you want to view.
- Click **Select Metric**, select the metrics to display, and click **OK**.
Performance history graphs of the metrics you selected are displayed. Select the same time range on different days to view the graphs. You can also click **Detail** on each metric performance graph to set a time range.
- Enable **Interactive Graph** to view other metrics at the same time.

----End


8.14.3.5 Custom Graphs

This section describes how to create custom graphs based on your service requirements on the DAS console.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

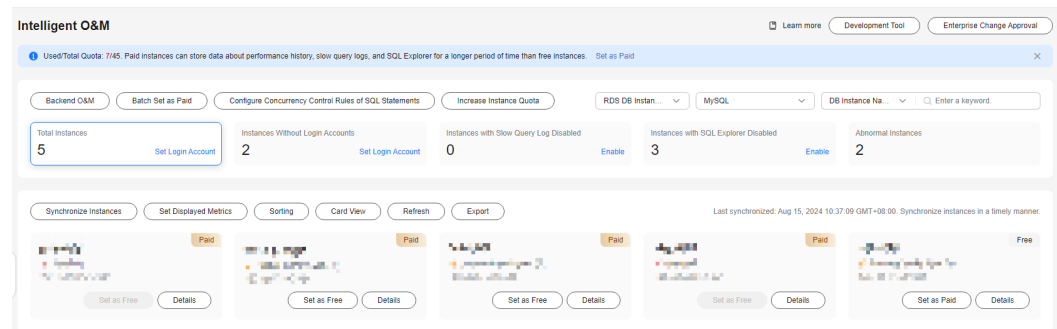
Step 2 Click  in the upper left corner and select a region and project.

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 8-114 Searching for instances

Step 6 Locate the target instance and click **Details**.

Step 7 Choose **Performance > Custom Graphs**.

Step 8 Click **Create Graph**. On the displayed page, enter a graph name and specify monitoring metrics.

Step 9 Click **OK**. On the **Custom Graphs** page, view the created graph.

----End

8.14.4 Sessions

8.14.4.1 Sessions that Can Be Killed If Necessary

You can end the sessions that can be killed if necessary in the following scenarios:

- If the number of sessions of an instance has reached the upper limit and the instance cannot be logged in to any longer, you can view and kill unnecessary sessions using the emergency channel function.
- You can view history logs to learn details of the kill operations that you performed using the emergency channel function.

Usage Notes

Killing a session may cause instance or service exceptions.

Prerequisites


- The kernel version of TaurusDB 5.6 must be 5.6.43.3 or later, and the kernel version of TaurusDB 5.7 must be 5.7.25.3 or later.
- This function is not available to ECS-hosted instances and instances in the creating, frozen, or abnormal state.
- Use this function in urgent conditions. All your kill operations will be logged.
- This function is not recommended if you can log in to your instance on the DAS console. After logging in to the instance, you can perform required operations on the **Real-Time Sessions** page.
- Sessions of sensitive users such as **rdsadmin**, **rdsbackup**, **rdsmetric**, and **rdsRepl** cannot be killed.

- When the CPU usage or the number of connections reaches the upper limit, requests to kill sessions may time out. In this case, you have to try more than once.

Procedure

Step 1 Log in to the Huawei Cloud console.

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

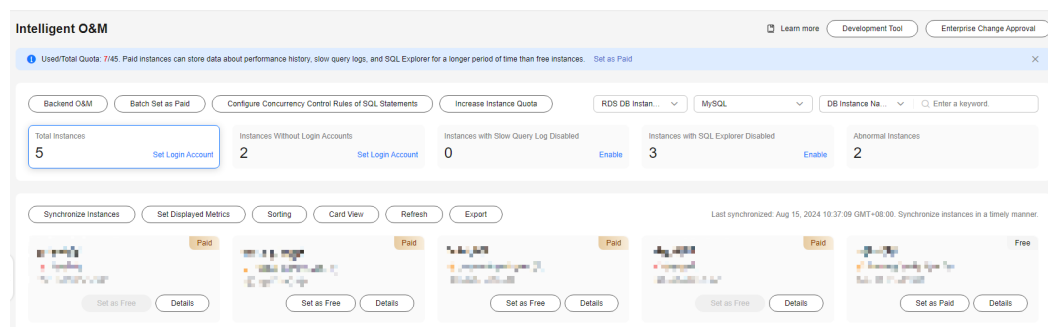
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 8-115 Searching for instances

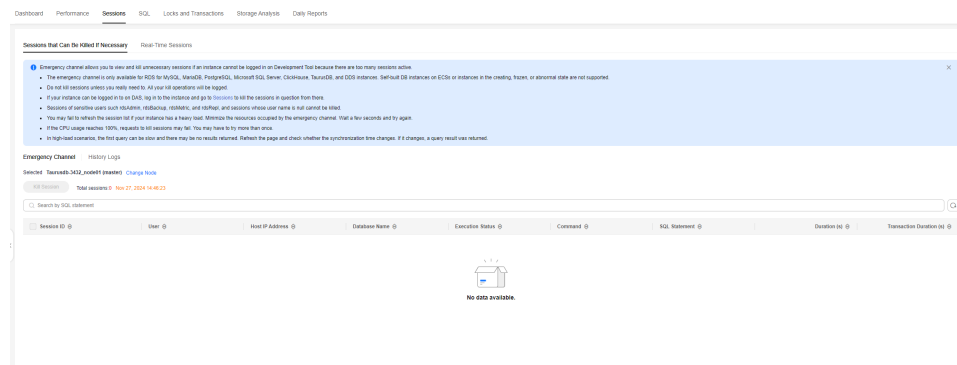


Step 6 Locate the target instance and click **Details**.

Step 7 Choose **Sessions** > **Sessions that Can Be Killed If Necessary**. Sessions are sorted and displayed in the session list in descending order by duration.

Step 8 Select the session you want to kill and click **Kill**.

Figure 8-116 Killing a session



Step 9 In the **Kill Session** dialog box, confirm the session information and click **Yes**.

Step 10 Click **History Logs** to view the sessions killed through the emergency channel.

----End

8.14.4.2 Real-Time Sessions

The real-time session function allows you to query session snapshots of your instance and can sort out and display only the required snapshots. You can quickly search for slow or active sessions in multiple dimensions like users, host IP addresses, and database names. DAS allows you to kill sessions to restore your instance, securing your database availability.


Usage Notes

Killing a session may cause instance or service exceptions.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

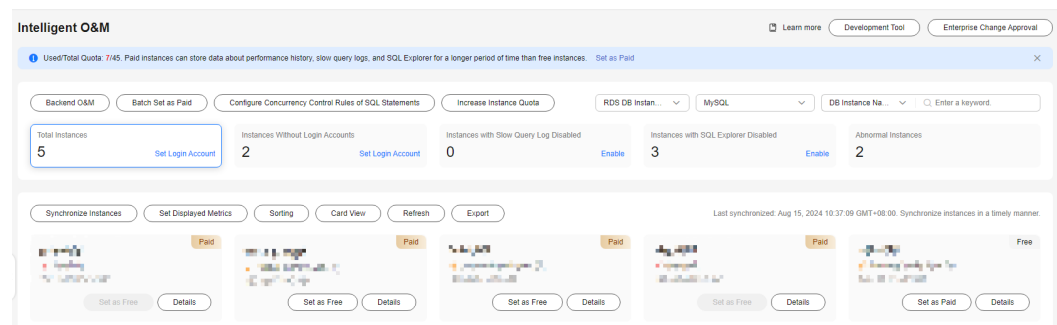
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

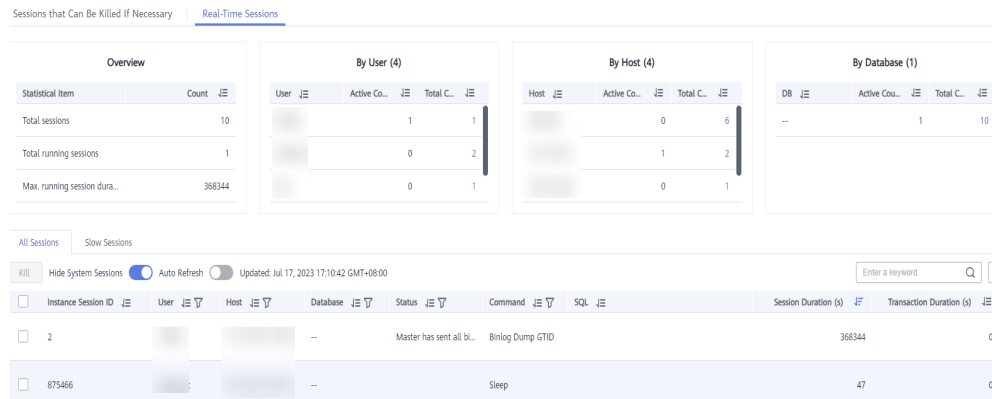
Figure 8-117 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 Choose **Sessions** > **Real-Time Sessions** to view session statistics, sessions, and slow sessions of the instance.

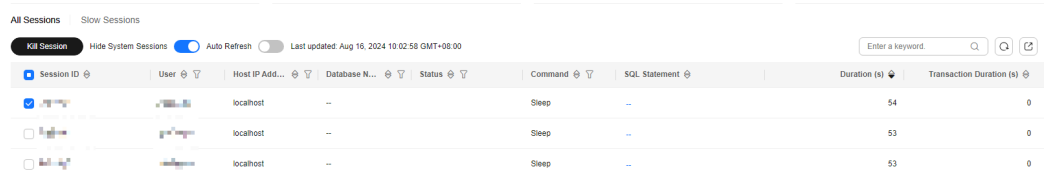
Figure 8-118 Real-time sessions



In the statistical item list, you can view total sessions, running sessions, and longest running session time of the current instance. You can also view total sessions and active sessions by user, host, or database. In the **All Sessions** area, you can view session details and perform the following operations:

- Select the abnormal session you want to end and click **Kill** for your database to recover.

Figure 8-119 Killing a session



- Toggle on or toggle off **Hide System Sessions** so that the system automatically filters or displays sessions.
- Enable **Auto Refresh**. The task list is automatically refreshed every 30 seconds.

In the **All Sessions** area, you can view slow session details and perform the following operations:

- Set a slow session threshold and click the refresh button to search for the slow sessions that last longer than this threshold.

Figure 8-120 Setting a slow session threshold



- Toggle on or toggle off **Hide System Sessions** so that the system automatically filters or displays sessions.
- Enable **Auto Refresh**. The task list is automatically refreshed every 30 seconds.
- Select the sessions you want to end and click **Kill** for the databases to recover.

----End

8.14.5 SQL

8.14.5.1 Slow Query Logs

This section describes how to analyze slow query logs in a specified period. Slow Query Log displays a chart of SQL statements that are taking too long to execute and allows you to sort slow SQL statements by multiple dimensions, such as by user, host, or SQL template. It helps you quickly identify bottlenecks and improve instance performance.


Usage Notes

- To use the slow query log function, you need to toggle on **Collect Slow Query Logs**. Then DAS will store slow query logs for analysis.
- Slow query logs of free instances are retained for only one hour while those of paid instances are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.
- You can enable the slow query logs function for a maximum of 10 free instances. There is no such a limit on paid instances.
- For free instances, you can only view slow query logs generated in the latest hour.

Viewing Slow Query Logs

Step 1 [Log in to the Huawei Cloud console](#).

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

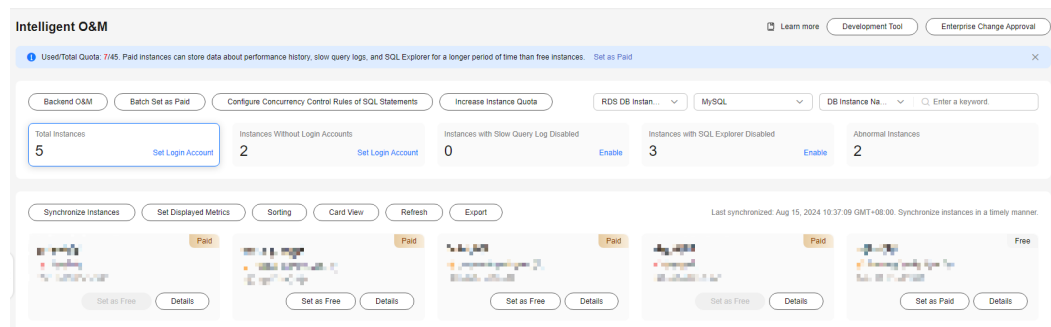
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 8-121 Searching for instances



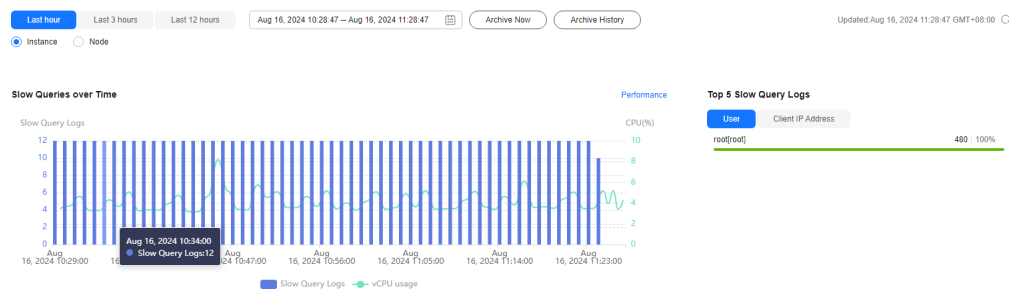
Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL > Slow Query Logs**.

Step 8 Select a time range and view trends, statistics, and details of the slow query logs generated within the time range.

- Log trends

Figure 8-122 Slow queries over time



In the trends graph, you can hover your mouse at any point in time to view slow query logs or CPU usage.

Above the chart, you can switch to another instance or node to view slow queries by instance or by node.

- Log details

View slow query log details in the lower part of the **Slow Query Logs** area. The details include the SQL statement, execution time, database name, client, user, execution duration, lock wait duration, and scanned and returned rows.

Figure 8-123 Viewing slow query log details

The screenshot shows the 'Details' view of slow query logs. It includes an 'Export' button and a 'View Export List' button. Below is a search bar with the text 'Default search by SQL statement'. The main table has the following columns: NO., Execution St..., SQL Statement, Database, Client IP Address, User, Execution D..., Lock Wait TL..., Rows Scanned, Rows Retu..., and Operation. The table contains three rows of data for 'select sleep' queries on the 'czt_test' database, all executed by 'root(root)'.

NO.	Execution St...	SQL Statement	Database	Client IP Address	User	Execution D...	Lock Wait TL...	Rows Scanned	Rows Retu...	Operation
1	Aug 16, 2024 14...	select sleep	czt_test	[IP Address]	root(root)	2,000.272	0	0	1	Concurrency Control Diagnose
2	Aug 16, 2024 14...	select sleep	czt_test	[IP Address]	root(root)	2,000.264	0	0	1	Concurrency Control Diagnose
3	Aug 16, 2024 14...	select sleep	czt_test	[IP Address]	root(root)	2,000.287	0	0	1	Concurrency Control Diagnose

Click **Export** to export slow query log details to a specific OBS bucket. After the details are exported, you can click **Export History** to view export records. You can also download the details to your local PC.

Figure 8-124 Exporting slow query log details

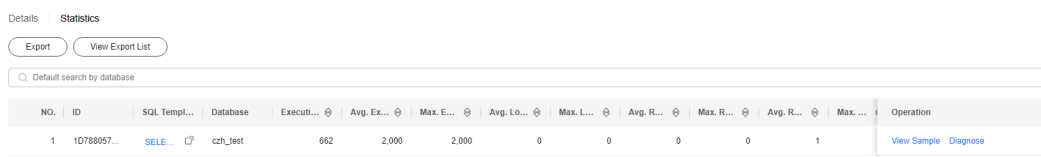


NOTE

This function is available to only paid instances.

Locate the SQL template you want to diagnose and click **Diagnose** in the **Operation** column.

- Slow query log statistics

Figure 8-125 Slow query log statistics

NO.	ID	SQL Templ...	Database	Executi...	Avg. Ex...	Max. E...	Avg. Lo...	Max. L...	Avg. R...	Max. R...	Avg. R...	Max. ...	Operation
1	10788057...	SELE...	czh_test	662	2,000	2,000	0	0	0	0	1	View Sample Diagnose	

Click **Sample** in the **Operation** column to view the sample of the SQL statement template.

On the **Statistics** page, click **Export** to export slow query logs to a specific OBS bucket. Then you can click **Export History** to view export records. You can also download the exported slow query logs to your local PC.

NOTE

This function is available to only paid instances.

----End

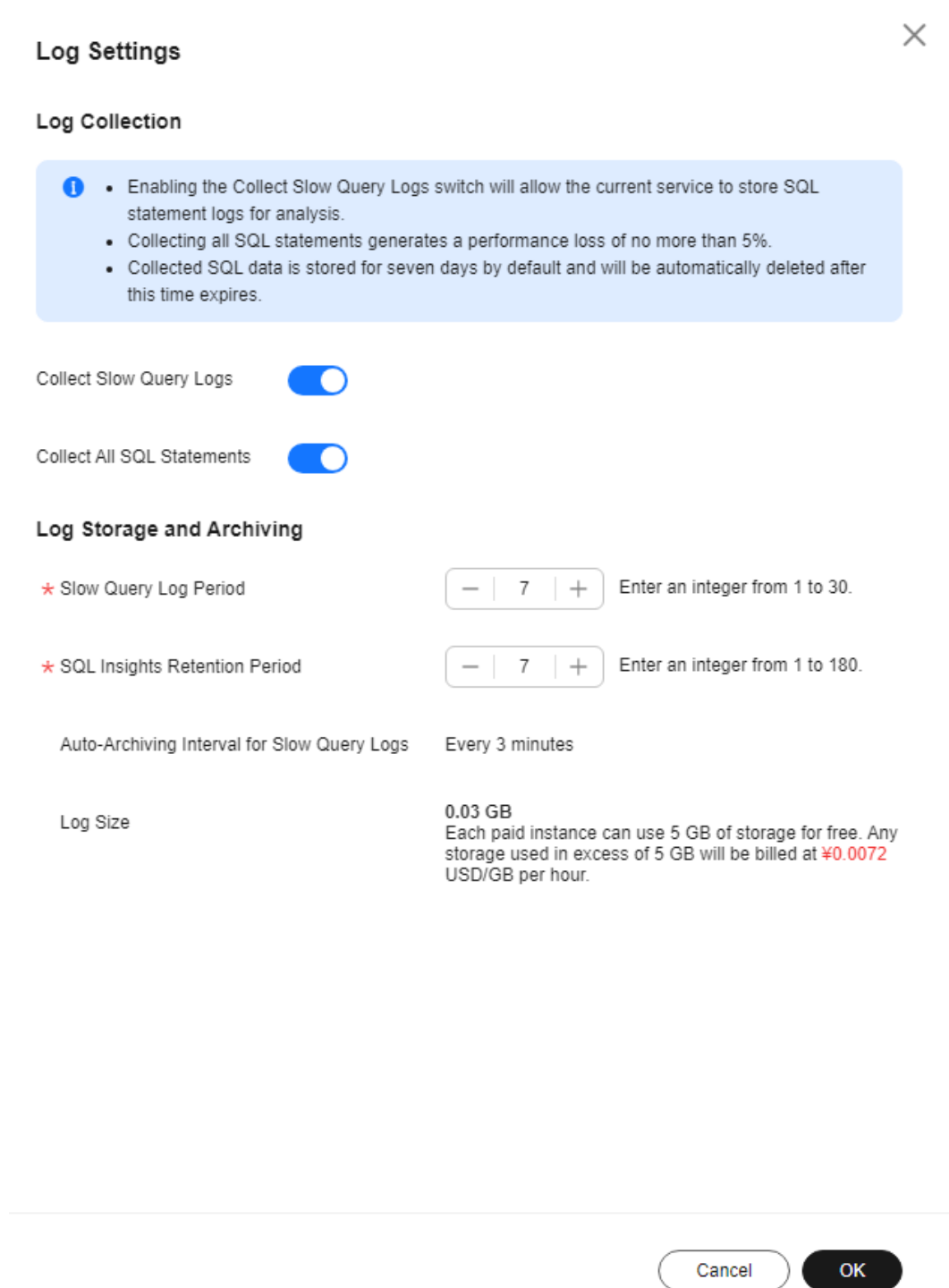
Slow Query Log Storage

After **Collect Slow Query Logs** is enabled, SQL text content will be stored in OBS for analysis.

Slow query logs of free instances are retained for only one hour while those of paid instances are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.

For paid instances, you can click **Log Settings** to set the storage duration on the **Slow Query Logs** tab page.

Figure 8-126 Setting storage duration for slow query logs



Each paid instance can use 5 GB of storage for slow query logs for free. Any storage used in excess of 5 GB will be billed on a pay-per-use basis.

8.14.5.2 SQL Explorer

After **Collect All SQL Statements** is enabled, you can gain a comprehensive insight into SQL statements on the **SQL Explorer** page. Top SQL helps you locate exceptions.

SQL Explorer can record all SQL statements executed on your instance and enables you to analyze and search for the tables that are accessed and updated the most frequently and the SQL statements that have the longest lock wait.


Usage Notes

- After **Collect All SQL Statements** is disabled, new SQL statements will not be collected and the collected SQL statements will be deleted.
- Logs of all SQL statements executed on free instances can be retained for only one hour while those for paid instances can be retained for seven days by default and for up to 30 days as a maximum. After the retention period expires, the logs are deleted automatically.

Execution Duration Distribution of Top SQL Templates

Step 1 [Log in to the Huawei Cloud console.](#)

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

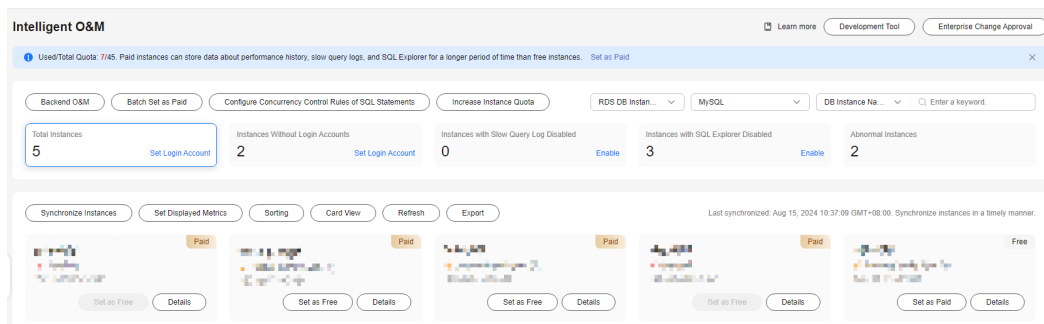
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 8-127 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL > SQL Explorer**.

Step 8 Toggle on **Collect All SQL Statements** to obtain information about all SQL statements executed on the current instance.

 NOTE

Collect All SQL Statements takes effect once it is enabled.

Step 9 On the **Top SQL** tab page, view execution duration of top SQL statements.

You can select **Last 1 hour**, **Last 3 hours**, or **Last 6 hours** based on service requirements to view the distribution. Or customize a time range that is no longer than one day.

The Execution Duration Distribution graph shows how many times SQL statements with different elapsed time lengths are executed over a specified time range. DAS collects SQL statistics of four elapsed time lengths.

- < 100 ms: number of SQL statement executions whose elapsed time is less than 100 ms
- 100 ms–500 ms: number of SQL statement executions whose elapsed time ranges from 100 ms to 500 ms
- 500 ms–1s: number of SQL statement executions whose elapsed time ranges from 500 ms to 1s
- > 1s: number of SQL statement executions whose elapsed time is longer than 1s

SQL statistics in the four elapsed time lengths are collected over the time range you specified.

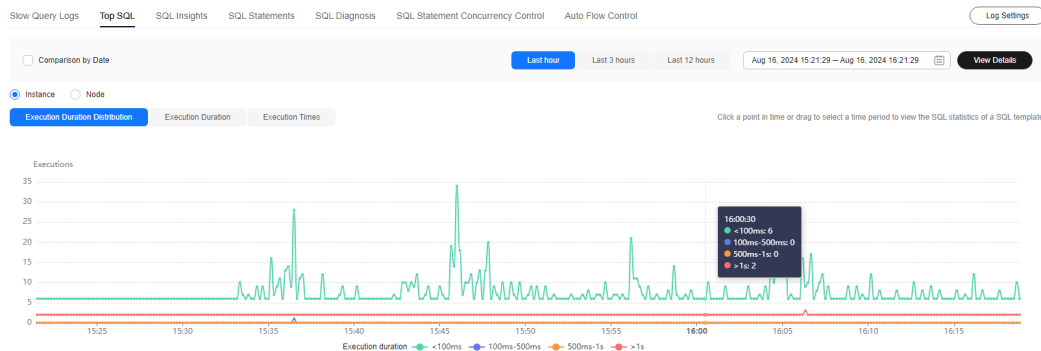
- If you select **Last hour**, SQL statement executions are calculated every 10 seconds.
- If you select **Last 6 hours**, SQL statement executions are calculated every minute.
- If you select a time range longer than 6 hours, SQL statement executions are calculated every 5 minutes.

Select **By instance** or **By node** to view execution duration distribution. You can change node to view its execution duration distribution. The primary node is selected by default. If you want to view the execution duration distribution of other nodes, click **Change Node**.

Step 10 Use either of the following methods to view execution duration details, such as average execution duration, total duration, average lock wait duration, and average scanned rows.

- Hover your mouse at any point in time on the graph to view top SQL statements at that time.

Figure 8-128 Viewing top SQL statements at a specific point in time



- Specify a time range using your mouse on the graph, and you will see top SQL statements during that time range.

Figure 8-129 Viewing top SQL statements in a specified time range




- Click **Export** to export details about all top SQL templates in the list. This function is available only to paid instances.
- In the SQL template list, locate a SQL template and click **Details** to view the total execution times, average rows scanned, average execution duration, and the like.
- In the SQL template list, locate a SQL template and click **Diagnose** to view details such as the execution plan, and suggestions for tuning indexes and SQL statements.

----End

SQL Audit

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 On the **Overview** page, click **Go to Intelligent O&M**.

Step 5 Locate the target instance and click **Details**.

Step 6 Choose **SQL > SQL Explorer**.

Step 7 Click the **SQL Audit** tab.

Step 8 On the **SQL Audit** tab page, view SQL audit tasks.

- Specify the start time, end time, task creation time, and node information to search for SQL audit tasks.
- Click **Add SQL Audit Task** and specify a time range to add a task. You can add an instance- or node-level task based on your service requirements. The added SQL audit task is displayed in the list below.
- Click **Details** in the **Operation** column to view task details. You can specify filters such as **Time Range**, **User**, **Keyword**, or **Database** and click **Query** to search for the SQL statements executed on the current instance. The selected time range must be after the time when the SQL audit task is added.

----End

8.14.5.3 SQL Diagnosis

This function enables you to diagnose SQL statements and obtain optimization suggestions.

 **CAUTION**

Diagnosing a large number of SQL statements will affect performance of your instance, so you are advised to use this function on an idle instance.


Usage Notes

- This function is available only to MySQL InnoDB.
- Only SELECT, INSERT, UPDATE, and DELETE statements can be diagnosed. An INSERT statement must contain a SELECT clause.
- Currently, SQL statements of databases information_schema, test, and mysql cannot be queried.
- SQL statements that contain views cannot be diagnosed.
- SQL Diagnosis obtains table structures and data distribution information (non-original). The obtained data is only for logic diagnosis, but not stored on the DAS server.
- Obtaining table structures and data distribution information may cause additional load to your instance, but has little impact on its performance.
- SQL diagnosis history is stored on the DAS server only. If you delete SQL diagnosis history on the console, it will be also deleted from the DAS server.
- SQL formatting improves readability of SQL statements. Formatting SQL statements enables statements to be displayed in line break mode, but does not change their logic and semantics.
- SQL formatting takes effect for all the SQL statements in the SQL window. You cannot format only one selected statement.

Procedure

Step 1 Log in to the Huawei Cloud console.

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

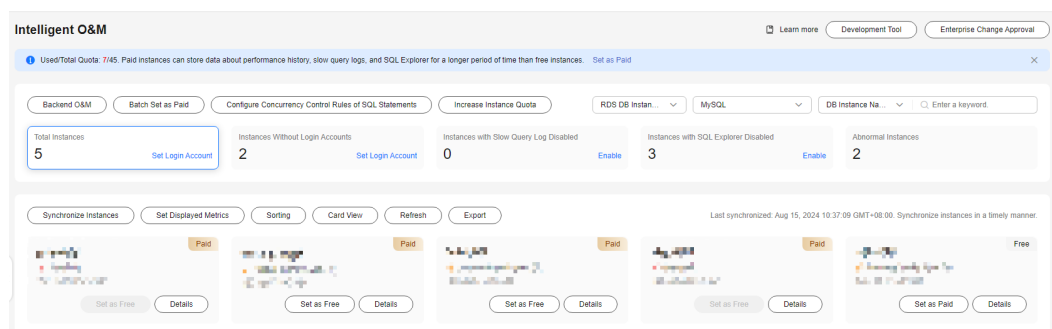
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 8-130 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 In the upper right corner of the page, click **Go to Old Edition**.

Step 8 Choose **SQL** > **SQL Diagnosis**. On the displayed dialog box, perform the following operations:

- On the **SQL Diagnosis** tab page, select the database where you want to diagnose a SQL statement, enter a SQL statement, and click **Diagnose**. The diagnosis result page is displayed.
- Select a database where you want to execute a SQL statement, enter a SQL statement, and click **Execute**. The system executes the statement and displays a result set.
- Select the target database, enter SQL statements, and click **Format**. The system formats all the SQL statements.
- Select the database where you want to view the SQL execution plan, enter SQL statements, and click **View Execution Plan**. The system executes all the SQL statements in sequence.

----End

8.14.5.4 SQL Statement Concurrency Control

SQL statement concurrency control restricts the execution of SQL statements based on specified rules when there are SQL statements that cannot be optimized timely or a resource (for example, vCPU) bottleneck occurs.

Usage Notes

- Concurrency control keeps TaurusDB instances stable regardless of how many SQL statements are concurrently submitted.
- The following TaurusDB kernel versions are supported:
 - 2.0.28.15 and later and earlier than 2.0.28.40
 - 2.0.29.1 and later
 - Concurrency control of INSERT in 2.0.54.240600 and later
- A single concurrency control rule can contain 128 keywords. Single backslashes (\) or single null characters (' ') cannot be used as keywords.
- Spaces at the beginning and end of a keyword and special null characters (such as \t, \r, and \n) will be ignored.
- The concurrency control rule cannot end with a tilde (~).
- Keywords in a concurrency control rule are sorted in a specific order, and the system will match them from first to last. If a rule contains **a~and~b**, the system only matches **xxx a>1 and b>2**.
- If a SQL statement matches multiple concurrency control rules, only the latest rule takes effect.
- Each SQL concurrency control rule applies to only the SQL statements that your database received after the rule is created.
- If different rules are created for the primary node and read replicas of an instance, the rules still apply to the node and read replicas after their roles are switched over.
- The length of all rules and concurrent queries of a single SQL type (SELECT, UPDATE, DELETE, or INSERT) cannot exceed 4,000 bytes. The length of a single rule cannot exceed 1,000 bytes.
- If you add many concurrency control rules, execution of SELECT, UPDATE, INSERT, or DELETE statements will slow down.
- Concurrency control rules are applied based on SQL statement prefixes. For example, if a concurrency control rule is **SELECT~COUNT~t1**, **SELECT COUNT(*) FROM t1** and **SELECT COUNT(*) FROM t1 LIMIT 1** will both be intercepted.
- If concurrency control is triggered, error "ERROR 1317 (70100): Query execution was interrupted" is reported.
- Concurrency control does not limit:
 - System tables
 - SQL statements not used to query data, for example, **select sleep(xxx)**
 - The **root** account for kernel versions earlier than 2.0.45.230900
 - SQL statements stored in the query cache

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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


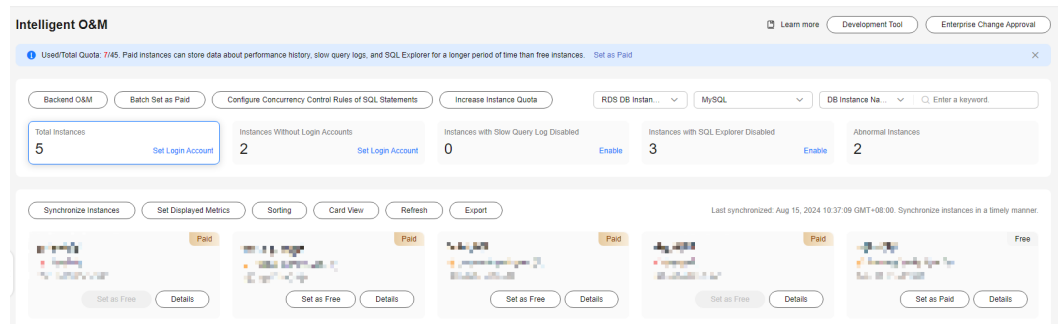
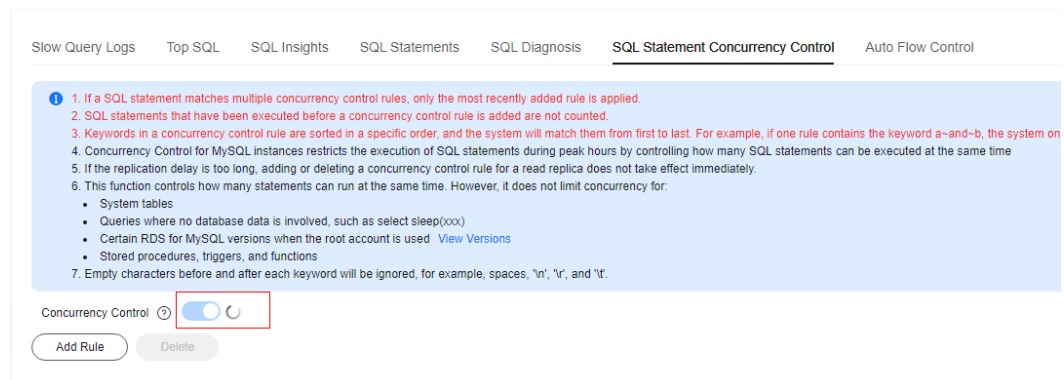
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane, choose **Intelligent O&M > Instance List**.
Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.
- Step 5** In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 8-131 Searching for instances



- Step 6** Locate the target instance and click **Details**.
- Step 7** Choose **SQL > SQL Statement Concurrency Control**.
- Step 8** On the displayed page, toggle on **Concurrency Control**.

Figure 8-132 Enabling SQL statement concurrency control



- Step 9** Click **Add Concurrency Control Rule**. In the displayed dialog box, select a SQL statement type, enter keywords, and specify the maximum number of concurrent SQL statements.

Figure 8-133 Add Rule

Add Rule
✕

SQL Type **SELECT** UPDATE DELETE

Keyword Generation Manually Using SQL statements

* Keyword ⓘ

Example: SELECT~COUNT~FROM~t1~WHERE~id

0/1,024 ✎

Enter keywords and separate them with tildes (~), for example, select~a. Keywords are case-insensitive.
Maximum keywords: 128

* Max. Concurrency - | | +

Kill existing sessions that match this rule

Cancel
OK

- **Keyword:** You can enter keywords or copy an existing SQL statement to the text box and click **Generate Keyword**.

NOTE

Keywords generated from an original SQL statement are only for reference. The following explains how a rule matches SQL statements based on keywords:

You can enter one or more keywords. Separate keywords with tildes (~). For example, if you enter keyword SELECT~a>1, this rule applies only to the SQL statements that contain SELECT and a>1, with SELECT placed before a>1.

- **Max. Concurrency:** SQL statements that meet the specified SQL type and keywords and exceed the value of **Max. Concurrency** will not be executed.

Step 10 Confirm the settings and click **OK**.

If a SQL statement concurrency control rule is no longer needed, click **Delete** in the **Operation** column.

----End


8.14.6 Daily Reports

The **Daily Reports** page provides overall information about your instance status of the previous day, including slow SQL analysis, all SQL analysis, and performance & disk analysis. You can download and subscribe to analysis reports. A daily diagnosis is recommended.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

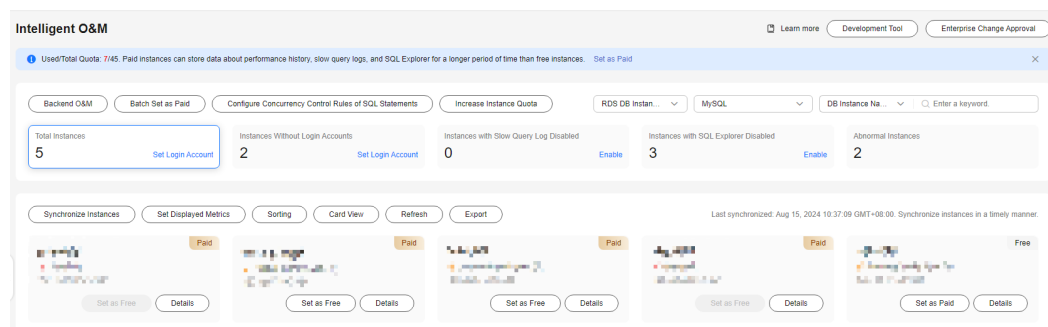
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

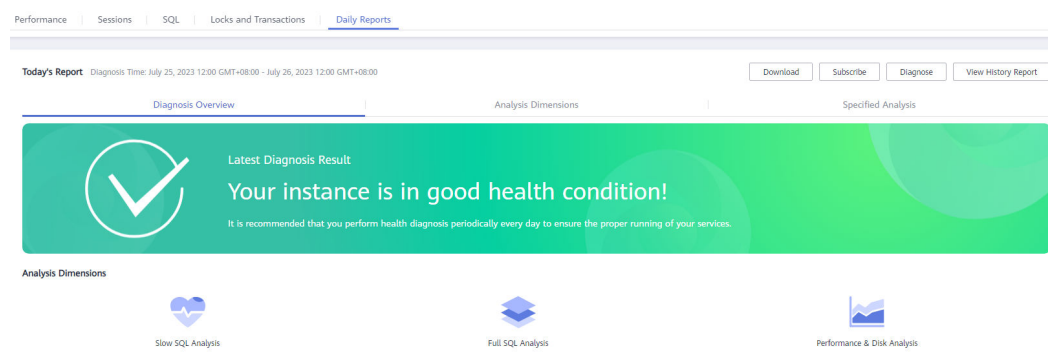
Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 8-134 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 On the displayed page, choose **Daily Reports**.



You can perform the following operations:

- Click **Download** to download a diagnosis report to your local PC.
- Click **Subscribe** and enter your email to have the diagnosis report emailed to you.

 **NOTE**

Before subscribing to diagnosis reports, note that:

- The subscription function depends on the Simple Message Notification (SMN) service.
 - After you subscribe to daily reports, diagnosis reports will be emailed to you after you manually diagnose your instance and the result is abnormal.
- Click **Diagnose** to diagnose the current instance.
 - Click **View History Report** to view historical diagnosis reports.
 - On the **Diagnosis Overview** page, view diagnosis results of the instance.
 - On the **Analysis Dimensions** page, view diagnosis dimensions, including Slow SQL Analysis, Full SQL Analysis, and Performance & Disk Analysis.
 - On the **Specified Analysis** page, view details in a report, including slow SQL analysis, full SQL analysis, and performance and disk analysis.

----End

8.14.7 Inspection Score

8.14.7.1 Inspection Score

DAS can score DB instances. You can manually start an inspection to stay ahead of your DB instance health within a specified period.

This section describes how to score instance health on the DAS console.

Usage Notes

- Currently, TaurusDB instances support this function.
- For details about scoring rules supported by DAS, see [Scoring Rules](#).


Prerequisites

You have logged in to the target TaurusDB instance, and the instance is running properly.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

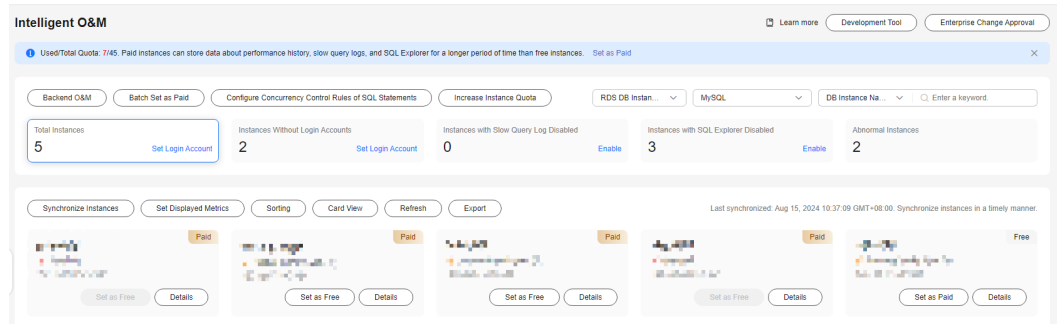
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

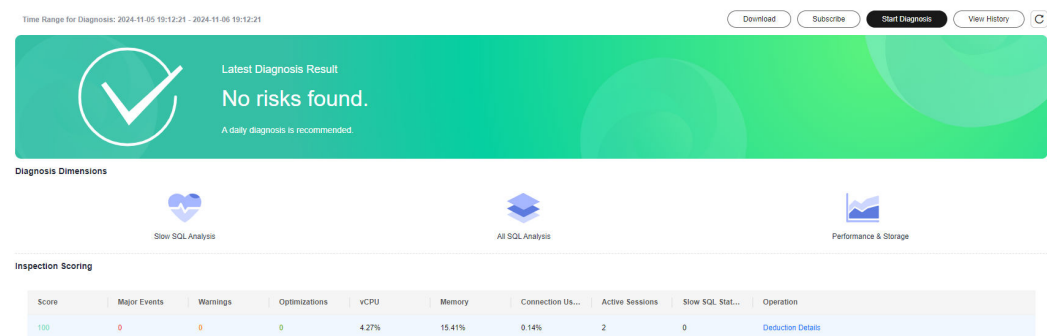
Figure 8-135 Searching for instances



Step 6 Select the instance whose health you want to score and click **Details**.

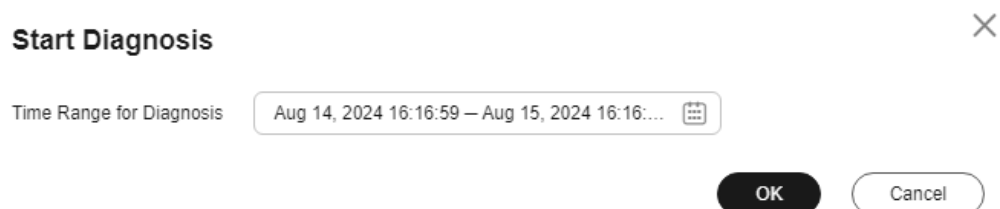
Step 7 On the top menu bar, choose **Daily Reports**.

Figure 8-136 Daily report



Step 8 Click **Start Diagnosis** in the upper right corner of the page and specify **Time Range for Diagnosis**. The time range cannot exceed one day.

Figure 8-137 Selecting a time range



Step 9 Click **OK**.

Step 10 After the diagnosis is complete, view the inspection score in the **Inspection Scoring** area.

Figure 8-138 Viewing the score

Inspection Scoring

Score	Major Events	Warnings	Optimizations	vCPU	Memory	Connection Us...	Active Sessions	Slow SQL Stat...	Operation
100	0	0	0	4.27%	15.41%	0.14%	2	0	Deduction Details

You can also click **Deducted Points** in the **Operation** column to view score deduction items and the deducted points.

Figure 8-139 Viewing deduction details

Deduction Details ✕

Item	Value	Deducted Points	Severity	Formula ?
Memory	15.41%	0	--	--
vCPU	4.27%	0	--	--
Connection Usage	0.14%	0	--	--
Active Sessions	2	0	--	--
Slow SQL Statem...	0	0	--	--

[View Scoring Rules](#)

OK

----End

8.14.7.2 Scoring Rules

This section describes inspection scoring rules.

Points are deducted based on scoring rules. You can view scores on the console.

Scoring rules

Table 8-12 Scoring rules of TaurusDB instances

Deduction Item	Description	Sub-item	Condition	Calculation Rule
Memory usage	Average memory usage per day	Major event	Memory usage > 90%	$\min[3 + (\text{Memory usage} - 0.9) \times 50, 10]$
		Warning	$80\% \leq \text{Memory usage} \leq 90\%$	$1 + (\text{Memory usage} - 0.8) \times 20$

Deduction Item	Description	Sub-item	Condition	Calculation Rule
CPU usage	Average CPU usage per day NOTE Multi-core CPUs need to be converted to single-core CPUs.	Major event	CPU usage \geq 80%	$\min[3 + (\text{CPU usage} - 0.8) \times 30, 10]$
		Warning	$70\% \leq \text{CPU usage} \leq 80\%$	$1 + (\text{CPU usage} - 0.7) \times 20$
Connection rate	Average connections per day/ Maximum of connections allowed in a day	Major event	Connection rate $>$ 80%	3
		Warning	$70\% \leq$ Connection rate \leq 80%	1
Active sessions	Active sessions generated in a day	Major event	Active sessions $>$ $\min(4 \times \text{CPU cores} + 8, 96)$	9
		Warning	Active sessions $>$ $\min(2 \times \text{CPU cores} + 8, 64)$	3
Slow SQL statements	Slow SQL statements executed per day	Major event	Slow SQL statements \geq 500	$18 + (\text{Slow SQL statements} - 10)/30$
		Warning	$100 \leq$ Slow SQL statements $<$ 500	$4 + (\text{Slow SQL statements} - 100)/30$
		Optimization	$0 <$ Slow SQL statements $<$ 100	$1 + (\text{Slow SQL statements} - 10)/30$

8.14.8 Locks and Transactions

8.14.8.1 InnoDB Locks

InnoDB lock waits generated before DML operations are displayed in real time. You can quickly locate the session waits and blocks that happened when multiple sessions update the same piece of data at the same time, and can terminate the source session that holds locks to restore blocked operations.


 **NOTE**

InnoDB Locks does not support DDL locks, also called metadata locks (MDLs). You view and analyze them on the **Metadata Locks** page.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

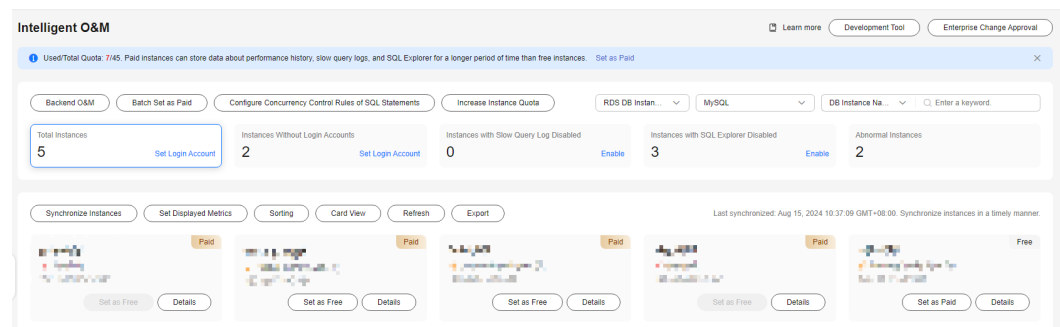
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 8-140 Searching for instances



Step 6 Select the instance that you want to use InnoDB Locks for and click **Details**.

Step 7 Choose **Locks and Transactions** > **InnoDB Locks** to check whether there are lock waits.

----End

9 GeminiDB Cassandra

9.1 Account Management


9.1.1 Role Management

This section describes how to create one or more roles and grant different permissions to each role.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Account Management > Role Management**.

Step 7 On the role management page, click **Create Role** in the upper left corner.

Step 8 On the **Basic Information** tab page, enter a role name (mandatory), set a password, and confirm the password.

You can select a role name from role members to grant permissions of an existing role to the current role.

Figure 9-1 Creating a role

The screenshot shows the 'Create Role' interface. At the top, there is a 'Create Role' title and a 'Back to Role Management List' button. Below this, there are three tabs: 'Basic Information', 'Data Permissions', and 'Role Permissions'. The 'Basic Information' tab is selected. It contains the following fields and options:

- Role Name:** A text input field with a red asterisk indicating it is required.
- Password:** A text input field with masked characters and a clear icon.
- Confirm Password:** A text input field with a clear icon.
- Allow Login**
- Super User**

At the bottom of the form, there is a 'Role Member' section with a checkbox and the text 'Role Member'.

NOTE

If no password is set for the role (for example, role_03) or **Allow Login** is not selected for the role, role_03 cannot be used to log in to the database. If the permissions of role_03 are assigned to another role (for example, test_02), test_02 will have all the permissions of role_03.

Step 9 (Optional) On the **Data Permissions** tab page, click **Add**. In the displayed dialog box, specify details such as the resource type, keyspace name, and permissions as required, confirm the settings, and click **OK**.

Step 10 (Optional) On the **Role Permissions** tab page, click **Add**. On the displayed page, specify a resource type, role name, and permissions as required, confirm the settings, and click **OK**.

Step 11 After setting required parameters, click **Save**. In the preview dialog box, click **OK**.

Step 12 On the role management page, edit, rename, and delete an existing role as required.

NOTE

- **admin**, **monitor**, **backupuser**, and **rwuser** are system roles and cannot be edited or deleted.
- Deleted roles cannot be recovered. Exercise caution when performing this operation.

----End

9.2 Keyspace Management

9.2.1 Overview

Function Overview

In a GeminiDB Cassandra instance, a keyspace is an object used to store columns and user-defined objects. A keyspace is equivalent to a database. Creating a key space is to create a database.

You can go to the **Keyspace Management** page in either of the following ways:

- In the keyspace list of the **Home** page, locate the keyspace you want and click **Manage** in the **Operation** column.
- Choose **Keyspace Management** on the top menu bar.

Figure 9-2 Keyspace management

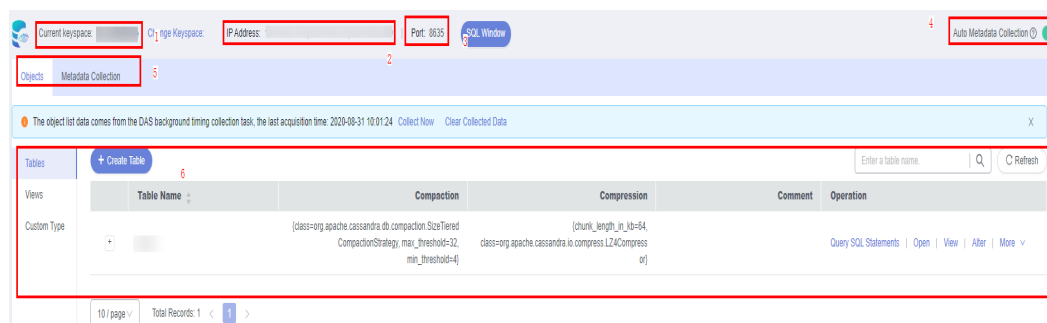


Table 9-1 Functions

No.	Description
1	Displays the name of the keyspace opened on the current page. You can change the keyspace to a non-system keyspace in the current DB instance.
2	Displays the IP address and port number of the current DB instance.
3	Allows you to open a SQL window for operating the current keyspace.
4	Periodically collects data and stores it to databases of DAS. Advantages: <ul style="list-style-type: none"> • Reduces queries on user keyspaces and the impact on the performance of user keyspaces. • Improves search performance for DB instances that contain a large number of tables and supports pagination queries. Only structural metadata is collected, which means that user's table data is not included.
5	Consists of object list and metadata collection functional modules.

No.	Description
6	Allows you to perform operations.

Object List

NOTE

If there are too many tables in an instance, the system will neither collect metadata nor reload tables to minimize impacts on database performance.

You can manage instance tables, views, and custom types, and perform operations including opening and viewing objects.

Metadata Collection

DAS periodically collects DB instance metadata and stores the collected data in the DAS database. In addition, it collects only structural metadata, but not data in user tables, which ensures data security. Metadata collection delivers the following advantages:

- Reduces queries on user keyspaces and impacts on the performance of user databases.
- Improves search performance for DB instances that contain a large number of tables and supports pagination queries.

NOTE

To ensure stable performance, DAS will temporarily stop collecting data when the instance QPS is over 10,000 or TPS is over 1,000.

Step 1 On the **Keyspace Management** page, click the **Metadata Collection** tab.

Step 2 On the displayed page, click **Collect Now** to start the collection.

You can also stop the collection or view collection details.

- **Clear Collected Data:** Clears the collected data such as metadata, keyspace structures, and table structures.
- **Delete Logs:** Deletes logs. Deleted logs cannot be recovered. Exercise caution when performing this operation.

----End

9.2.2 Creating a Keyspace

In a GeminiDB Cassandra instance, a keyspace is an object used to store columns and user-defined objects. A key space is equivalent to a database. Creating a key space is to create a database.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)



- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the displayed page, click **Create Keyspace**.

Figure 9-3 Creating a keyspace



- Step 7** On the displayed page, enter a keyspace name, set the number of replication factors, and determine whether to enable **Durable Writes**.
- Step 8** After all settings are complete, click **OK**.
----End



9.2.3 Deleting a Keyspace

This section describes how to drop a keyspace that is no longer needed.

Precautions

Dropped keyspaces cannot be recovered. Exercise caution when performing this operation.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** In the keyspace list, locate the keyspace that you want to drop and choose **More > Drop** in the **Operation** column.
- Step 7** In the dialog box that is displayed, confirm the information and click **Yes**.

----End

9.3 SQL Operations

9.3.1 SQL Window

DAS allows you to easily run various SQL statements in a graphical SQL window and to perform operations on databases, such as adding, deleting, editing, and viewing a database.

Introduction to SQL Window

Figure 9-4 SQL window

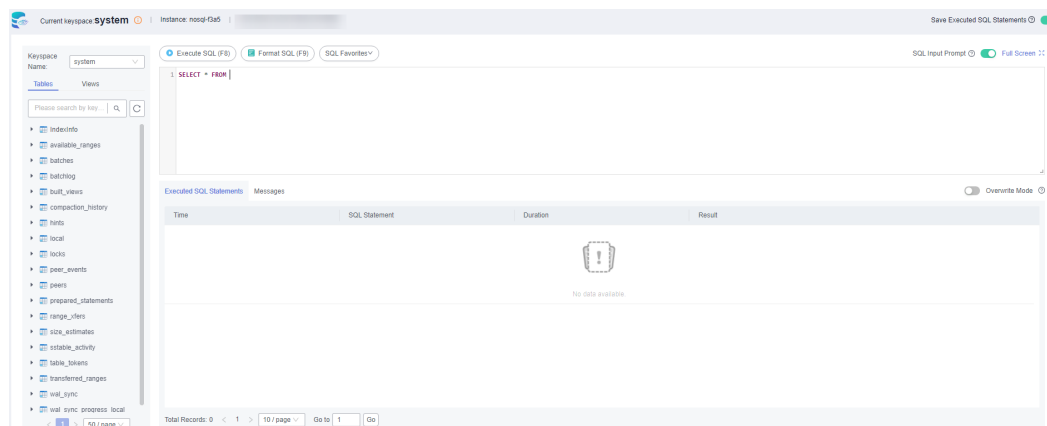



Table 9-2 Functions of the SQL window

Function	Description
Execute SQL	Executes SQL statements. SQL operations are performed on tables and views in a database.
Format SQL	Improves readability of SQL statements. Formatting SQL statements enables statements to be displayed in line break mode, but does not change their logic and semantics. SQL formatting takes effect for all the SQL statements in the SQL window. You cannot format only one selected statement.
SQL Favorites	Allows you to add, view, and manage frequently-used SQL statements.
Save Executed SQL Statements	After this function is enabled, the system saves the recently executed SQL statements to the server.
SQL Input Prompt	Helps you quickly enter a specific database, table, or field name when you enter a SQL statement in the SQL window.
Full Screen	Shows SQL statements on a full screen.
Executed SQL Statements	Shows SQL execution details.
Messages	Shows the information returned after a SQL statement is executed.
Result Set	Shows SQL execution results. Allows you to view details about a single row, add a row, submit for editing, delete a row, export a row, copy a row, copy a column, set a column, and more.
Overwrite/Append Mode	<ul style="list-style-type: none">● Append Mode: Each time a SQL statement is executed, the new result set is appended to the previous one.● Overwrite Mode: Each time a SQL statement is executed, the new result set overwrites the previous one.

Opening the SQL Window

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.


----End


9.3.2 Executing SQL Statements

This section describes how to execute various SQL statements.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

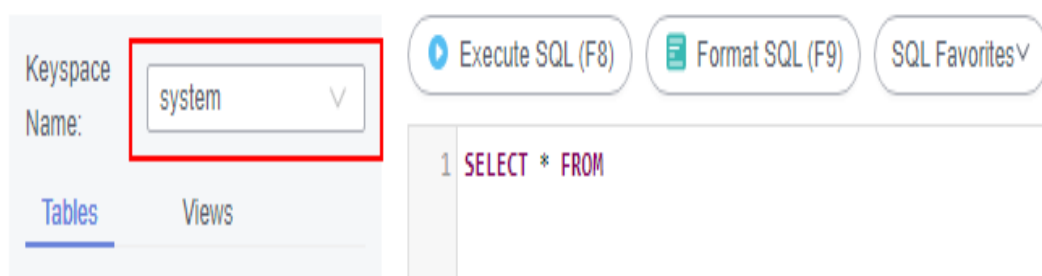
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

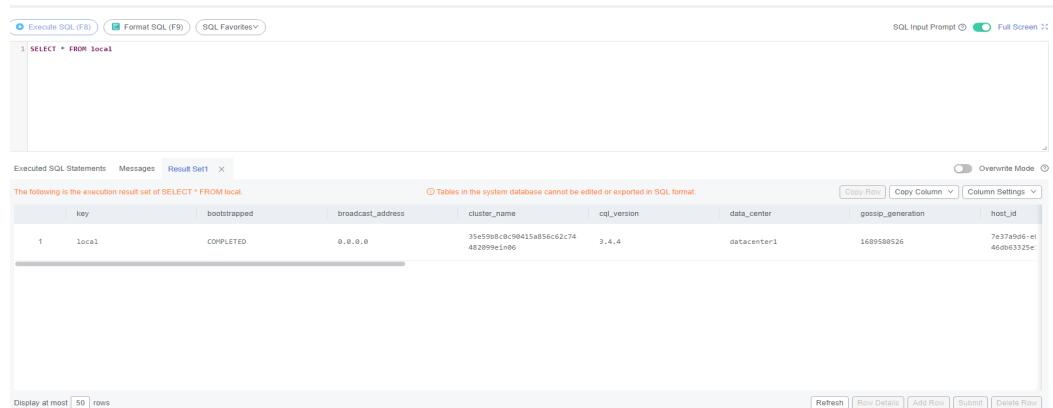
Step 7 Select a keyspace in the upper left corner of the page.

Figure 9-5 Selecting a keyspace



Step 8 Enter a SQL statement in the SQL window and click **Execute SQL**.

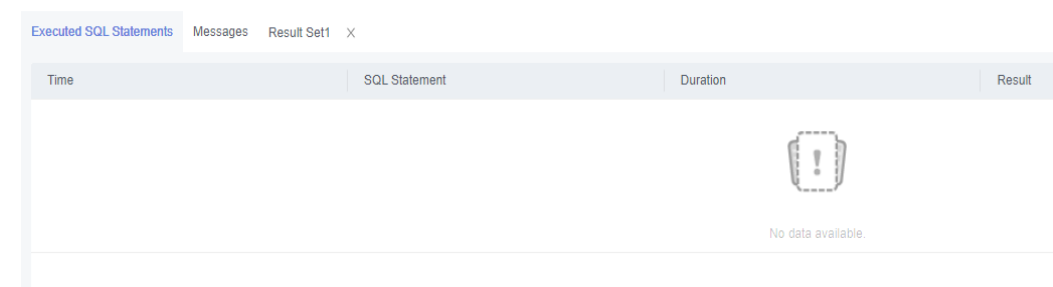
Figure 9-6 Executing SQL statements



- Enabling **SQL Input Prompt** is recommended. It helps you select the required database, table, or field name when you enter a SQL statement in the SQL window.
- To protect query result sets from being displayed as garbled characters, select an encoding format other than the default encoding format, UTF-8.
- You can execute multiple SQL statements at a time. Separate them using semicolons (;). You can click **Full Screen** to view logics in SQL statements clearly.
 - To execute some of the SQL statements, select the statements before executing them.
 - To execute all SQL statements, do not select any SQL statements or select all SQL statements.

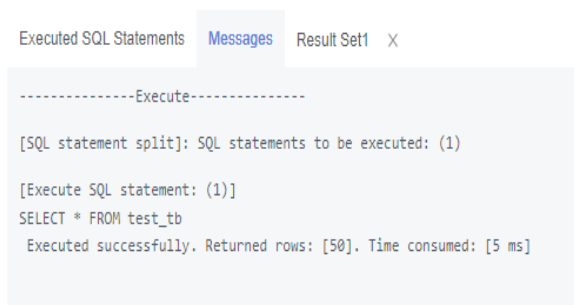
Step 9 View execution details of the current SQL statement and previously executed SQL statements in the lower part of the page.

Figure 9-7 Viewing execution records



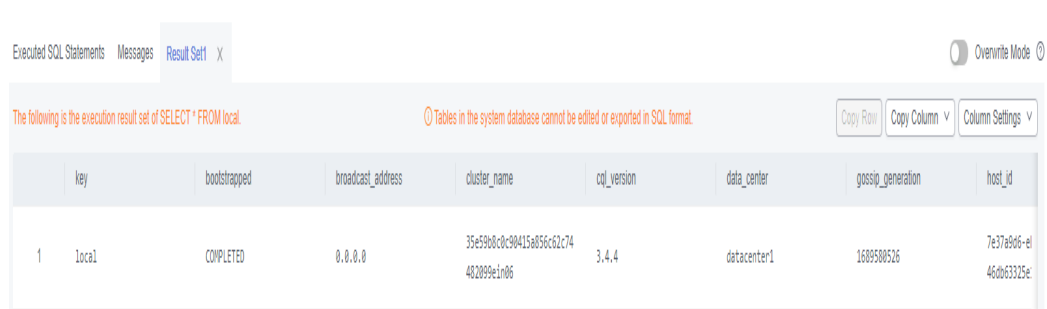
Step 10 Click the **Messages** tab, view SQL execution details, including affected rows, progress, and time required.

Figure 9-8 Viewing messages



Step 11 On the **Result Set** tab, view SQL execution results.

Figure 9-9 Viewing result sets



You can also perform the operations described in [Table 9-3](#) on result sets.

Table 9-3 Operations

Function	Description
Copy Row and Copy Column	Copies a row or column for reuse.
Column Settings	Customizes the display of columns when there are a number of columns in the query result.
Convert binary to hexadecimal	Converts binary data in the result set into hexadecimal data for display.
Refresh	Refreshes changed data.
Row Details	Displays the column field name, type, and data of the selected row.
Add Row	Adds an empty row to the result set.
Submit	Views the SQL statements to be modified. After you click OK , the result set is updated.
Delete Row	Deletes the selected row, including data.

Function	Description
Export	The SQL, CSV, and Excel files are supported. No more than 7.84 MB of data with 10,000 records can be exported. The actual size of an Excel file may exceed 7.84 MB due to its format.
Export More	Redirects you to the data export page and allows you to export over 10,000 rows of data.

 **NOTE**

- If the result set involves a view, data in the result set cannot be edited.
- If the type of the result set is metadata, the data cannot be edited or displayed on multiple pages.
- If the result set involves multiple tables, data in the result set cannot be edited.
- If only one table is in the result set and does not contain all primary key columns or any primary keys, you cannot edit the data.
- Data in virtual tables (for example, tables generated during execution of a stored procedure) cannot be edited.

----End

9.3.3 SQL Favorites

This section describes how to add frequently-used SQL statements and to view and manage them.

Procedure



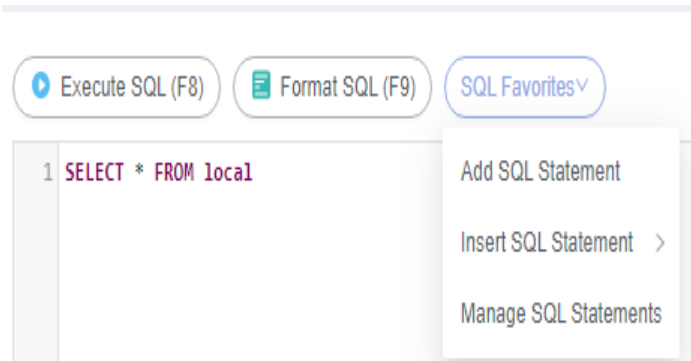
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- Step 7** In the SQL window, click **SQL Favorites**.

Figure 9-10 SQL favorites



- **Add SQL Statement:** allows you to add frequently-used SQL statements. Specifically, specify a title, select an application scope, enter SQL statements, and then click **Save**.

Figure 9-11 Adding a SQL statement

Add SQL Statement

* Title:

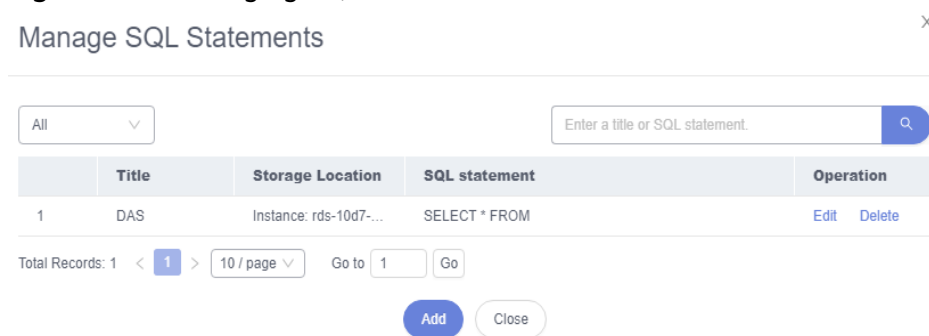
Application Scope: All DB instances Current DB instance Current database

* SQL statement:

```
1 SELECT * FROM student
```

- **Insert SQL Statement:** allows you to view the SQL statements you have added. If there are no SQL statements stored in your account, this option will not be displayed.
- **Manage SQL Statements:** allows you to manage frequently-used SQL statements, including adding, editing, and deleting SQL statements.

Figure 9-12 Managing SQL statements



----End

9.3.4 SQL History

After you toggle on **Save Executed SQL Statements**, DAS will save the SQL statements you executed in the SQL window for future view. You can also execute the SQL statements again with no need to enter them again in the SQL window.

Prerequisites

You have enabled **Save Executed SQL Statements** in the upper right corner of the **SQL Query** page. After this function is enabled, executed SQL statements will be saved on the DAS management host.

Constraints on Usage

SQL statement execution records can be stored for up to one year.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL History**.
- Step 7** On the displayed page, search for execution information about the target SQL by time range, keyspace name, or keyword.

Figure 9-13 SQL history

Database name	SQL Statement	Time	Duration	Operation
testtable	SELECT * FROM table1	2020-08-31 10:09:32	3 ms	Open in SQL window
testtable	SELECT * FROM table1	2020-08-31 10:07:36	2 ms	Open in SQL window
testtable	SELECT * FROM table1	2020-08-31 10:07:22	3 ms	Open in SQL window
testtable	SELECT * FROM table1	2020-08-31 10:05:17	2 ms	Open in SQL window
testtable	SELECT * FROM table1	2020-08-31 10:04:03	2 ms	Open in SQL window

- To go to the **Keyspace Management** page, click a keyspace name.
- To copy a SQL statement, click it in the **SQL Statement** column.
- To execute a SQL statement, click **Open in SQL window** in the **Operation** column.

----End

9.4 Table Management

9.4.1 Creating a Table

A data table consists of basic information, fields, and indexes. As a supplement to table information, indexes are optional and can be configured based on service requirements.

Procedure



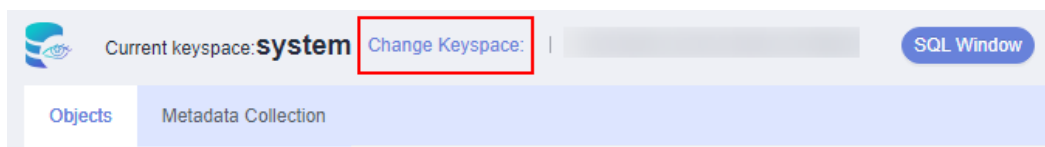
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Keyspace Management**.
- Step 7** Click **Change Keyspace** on the right of the current keyspace to switch to the keyspace where you want to create a table.

Figure 9-14 Switching the keyspace



- Step 8** On the **Objects** tab page, choose **Tables**.
- Step 9** Click **Create Table**.
- Step 10** After configuring basic information, click **Next**.
- Step 11** On the **Column** page, click **Add** and set parameters as needed.
- Step 12** If you need to add indexes, click **Next** and specify index parameters.
- Step 13** Click **Create**.

Step 14 In the **SQL Preview** dialog box, click **Execute**.

----End


9.4.2 Opening a Table

If a table has primary keys, you can add, delete, modify, or query table data as you do in Excel.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

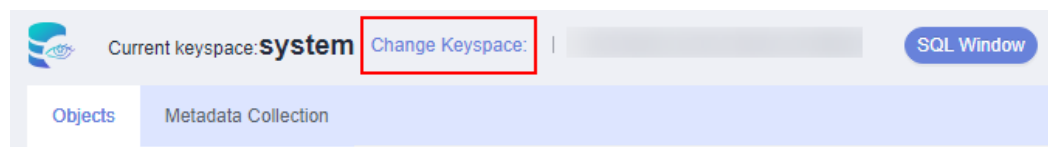
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Keyspace Management**.

Step 7 Click **Change Keyspace** on the right of the current keyspace to switch to the keyspace where you want to open a table.

Figure 9-15 Switching the keyspace



Step 8 On the displayed **Objects** tab, choose **Tables** on the left. In the table list, locate the table you want to open, and click **Open** in the **Operation** column.

Step 9 On the table details page, double-click a cell to edit data. After adding or editing data, submit and save the changes.

Table 9-4 UI operations

Name	Description
Where Condition	Filters records.
Copy Row	Copies data of the selected row. Specifically, double-click the target row and then click Copy Row .
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.

Name	Description
Column Settings	Allows you to set the columns you want to display.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.
Add Row	Allows you to add rows.
Submit	Allows you to submit and save the changes to data.
Delete Row	Allows you to delete the selected rows.

----End

9.4.3 Viewing Details of a Table

This section describes how to view details of a table and the SQL statement for creating this table.

Procedure



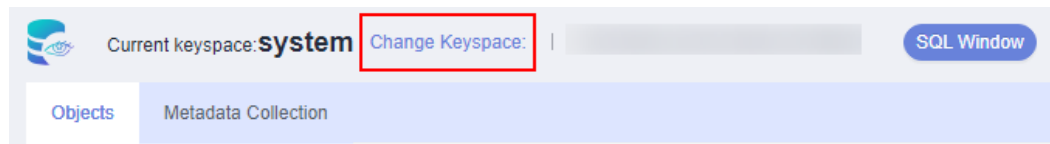
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Keyspace Management**.
- Step 7** Click **Change Keyspace** on the right of the current keyspace to switch to the keyspace where you want to view details of a table.

Figure 9-16 Switching the keyspace



- Step 8** On the displayed **Objects** tab, choose **Tables**, locate the table whose details you want to view, and click **View** in the **Operation** column.
- Step 9** In the displayed dialog box, view basic information and DDL statements of the table.

----End

9.4.4 Altering a Table

After a table is created, you can alter information of the table, including basic information, columns, and indexes.

Usage Notes

Improper alterations on a table will cause instance or service exceptions.

Procedure



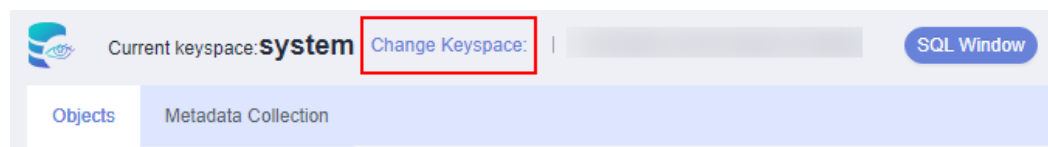
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Keyspace Management**.
- Step 7** Click **Change Keyspace** on the right of the current keyspace to switch to the keyspace where you want to alter a table.

Figure 9-17 Switching the keyspace



- Step 8** On the displayed **Objects** tab, choose **Tables** on the left.
- Step 9** In the table list, locate the table you want to alter and click **Alter** in the **Operation** column.

Figure 9-18 Table list

The screenshot shows a table list interface. At the top left, there is a 'Tables' tab and a '+ Create Table' button. Below this is a table with the following columns: 'Table Name', 'Compaction', 'Compression', 'Comment', and 'Operation'. The 'Table Name' column contains a '+' icon and the text 'IndexInfo'. The 'Compaction' column contains '(class=org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy, max_threshold=32, min_threshold=4)'. The 'Compression' column contains '(chunk_length_in_kb=64, class=org.apache.cassandra.io.compress.LZ4Compressor)'. The 'Comment' column contains 'built column indexes'. The 'Operation' column contains 'Query SQL Statements | Open | View | Alter | More'.

Views	Table Name	Compaction	Compression	Comment	Operation
Custom Type	+ IndexInfo	(class=org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy, max_threshold=32, min_threshold=4)	(chunk_length_in_kb=64, class=org.apache.cassandra.io.compress.LZ4Compressor)	built column indexes	Query SQL Statements Open View Alter More

- Step 10** On the displayed tab, modify table information and click **Save**.
- Step 11** Click **Alter**.
- Step 12** In the **SQL Preview** dialog box, click **Execute**.

----End

9.4.5 Clearing a Table

This section describes how to clear data in a table.

Precautions

Cleared tables cannot be recovered. Exercise caution when performing this operation.

Procedure



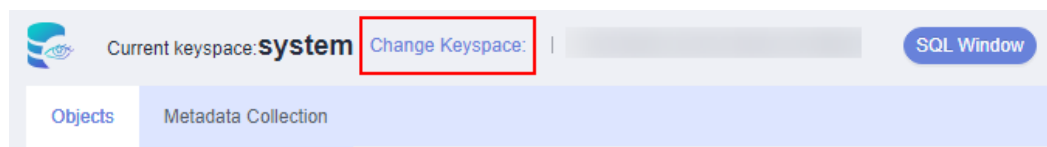
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Keyspace Management**.
- Step 7** Click **Change Keyspace** on the right of the current keyspace to switch to the keyspace where you want to clear a table.

Figure 9-19 Switching the keyspace



- Step 8** On the displayed **Objects** tab, choose **Tables** on the left.
- Step 9** In the table list, locate the table whose data you want to clear and choose **More > Clear** in the **Operation** column.

Figure 9-20 Clearing a table

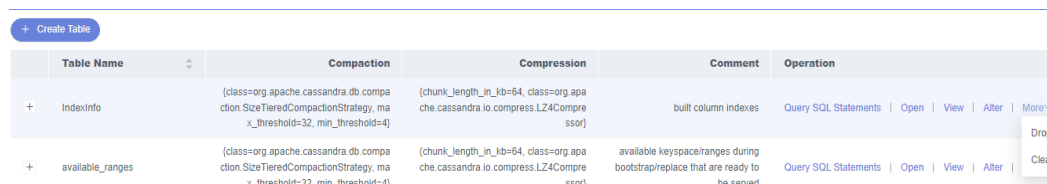
The screenshot shows a table list with columns: Table Name, Compaction, Compression, Comment, and Operation. Two tables are visible: 'IndexInfo' and 'available_ranges'. The 'available_ranges' table has a 'Drop' button in its 'Operation' column, which is highlighted with a red rectangular box.

	Table Name	Compaction	Compression	Comment	Operation
+	IndexInfo	{class=org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy, max_threshold=32, min_threshold=4}	{chunk_length_in_kb=64, class=org.apache.cassandra.io.compress.LZ4Compressor}	built column indexes	Query SQL Statements Open View Alter More >
+	available_ranges	{class=org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy, max_threshold=32, min_threshold=4}	{chunk_length_in_kb=64, class=org.apache.cassandra.io.compress.LZ4Compressor}	available keyspace/ranges during bootstrap/replace that are ready to be served	Query SQL Statements Open View Alter Drop

- Step 10** In the displayed dialog box, click **Yes**.

----End

9.4.6 Dropping a Table

This section describes how to drop a table that is no longer needed.

Precautions

Dropped tables cannot be recovered. Exercise caution when performing this operation.

Procedure



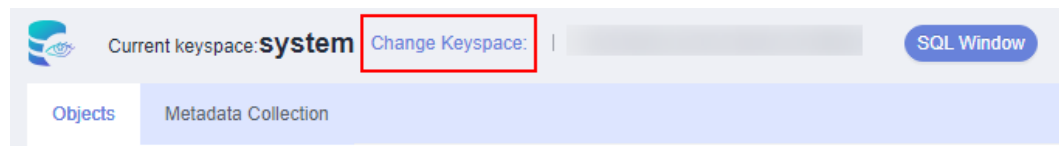
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Keyspace Management**.
- Step 7** Click **Change Keyspace** on the right of the current keyspace to switch to the keyspace where you want to delete a table.

Figure 9-21 Switching the keyspace



- Step 8** On the displayed **Objects** tab, choose **Tables** on the left.
- Step 9** In the table list, locate the table that you want to drop and choose **More > Drop** in the **Operation** column.

Figure 9-22 Dropping a table

The screenshot shows a table list interface with a 'Create Table' button at the top left. The table has the following columns: Table Name, Compaction, Compression, Comment, and Operation. Two tables are listed: 'indexInfo' and 'available_ranges'. The 'available_ranges' table has a 'Drop' button in its 'Operation' column, which is highlighted with a red box.

Table Name	Compaction	Compression	Comment	Operation
indexInfo	(class=org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy, max_threshold=32, min_threshold=4)	(chunk_length_in_kb=64, class=org.apache.cassandra.io.compress.LZ4Compressor)	built column indexes	Query SQL Statements Open View Alter More >
available_ranges	(class=org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy, max_threshold=32, min_threshold=4)	(chunk_length_in_kb=64, class=org.apache.cassandra.io.compress.LZ4Compressor)	available keyspace/ranges during bootstrap/replace that are ready to be served	Query SQL Statements Open View Alter Drop Clear

- Step 10** In the displayed dialog box, click **Yes**.

----End

9.5 View Management

9.5.1 Opening a View

Graphical window for creating a GeminiDB Cassandra view is not available. To create a view, execute SQL statements in the SQL window. For details, see [Executing SQL Statements](#).

After a view is created, you can open the view on the DAS console and view data in it.

Precautions

GeminiDB Cassandra views cannot be edited.

Procedure



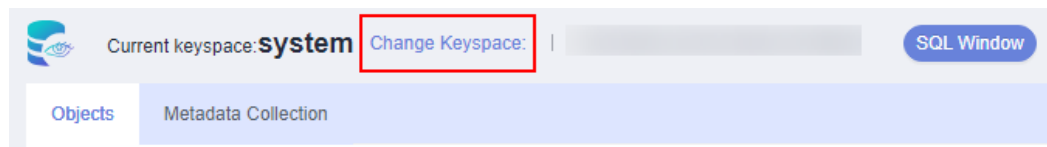
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Keyspace Management**.
- Step 7** Click **Change Keyspace** on the right of the current keyspace to switch to the keyspace where you want to open a view.

Figure 9-23 Switching the keyspace



- Step 8** On the displayed **Objects** tab, choose **Views** on the left. In the table list, locate the view you want to open, and click **Open** in the **Operation** column.
- Step 9** On the displayed page, obtain details of the view.

You can also perform the operations listed in [Table 9-5](#).

Table 9-5 UI operations

Name	Description
Where Condition	Filters records.
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.
Column Settings	Allows you to set the columns you want to display.
Refresh	Allows you to update table data manually.

----End

9.5.2 Viewing Details of a View

This section describes how to view details of a view on the DAS console.

Procedure



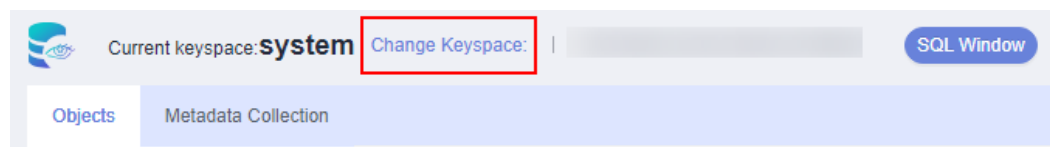
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Keyspace Management**.
- Step 7** Click **Change Keyspace** on the right of the current keyspace to switch to the keyspace where you want to view details of a view

Figure 9-24 Switching the keyspace

- Step 8** On the displayed **Objects** tab, choose **Views** on the left.
You can search for views by view name.
- Step 9** In the view list, locate the view you want to view and click **View** in the **Operation** column.
- Step 10** In the displayed dialog box, view details of the view.

----End

9.6 Keyspace Custom Types

9.6.1 Viewing Custom Type

If basic types do not meet your requirements or are inconvenient for use, you can create a new type in the SQL window.

After a user-defined type is created, you can view its details on the DAS console.

Procedure



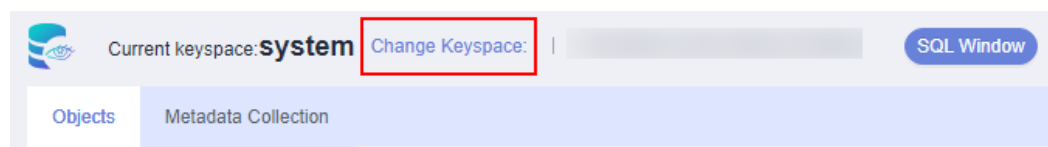
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Keyspace Management**.
- Step 7** Click **Change Keyspace** on the right of current keyspace to switch to the keyspace where you want to create a table.

Figure 9-25 Switching the keyspace



- Step 8** In the object list, choose **Custom Type**.
You can search for user types by type name.
- Step 9** Locate the user type you want to view and click **View** in the **Operation** column.
- Step 10** In the displayed dialog box, obtain the user type details.

----End

9.7 Data Import and Export

9.7.1 Importing Data

This section describes how to import data from your local PC or an OBS bucket for data backup and migration.


Usage Notes

- Only one file that is no larger than 1 GB can be imported at a time.
- Only data files in the CSV or CQL format can be imported.
- Field BLOB is not supported.
- The size of a single SQL statement to be imported must be less than 100 MB.
- Only OBS buckets of the current IAM account can be imported.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Import**.

Step 7 Click **Create Task**.

Figure 9-26 Creating an import task

Create Task
×

Import Type

sql
CSV

File Source

Upload file
Choose from OBS

Attachment Storage ?

5257 ▼

Bucket ACL Info

No OBS bucket? [Create OBS Bucket](#)

Creating an OBS bucket is free of charge, but storing files in it will incur fees.

+
 Click here to upload a file, or drag one here. (.sql)

Upload only one attachment that is no larger than 1 GB.

Database

prd ▼

Charset

UTF8
GBK
Auto Detect

Options

Ignore errors, that is, skip the step where the SQL statement fails to be executed.

Delete the uploaded file upon an import success.

Remarks

Create

Cancel

Table 9-6 Parameter description

Parameter	Description
Import Type	Set Import Type to cql or CSV .

Parameter	Description
File Source	<p>Import a file from your local PC or an OBS bucket.</p> <ul style="list-style-type: none"> Upload file If you select Upload file for File Source, you need to set Attachment Storage and upload the required file. To keep your data secure, provide your own OBS bucket to store the file you uploaded. In this way, DAS automatically connects to your OBS bucket for in-memory reading. No data is stored on DAS. Creating OBS buckets is free of charge, but saving files will incur certain costs. If you select Delete the uploaded file upon an import success, the file you uploaded will be automatically deleted from the OBS bucket after being imported to the destination database. Choose from OBS If you select Choose from OBS for File Source, you need to select a file from the bucket. The file uploaded from an OBS bucket will not be deleted upon an import success.
Attachment Storage	<p>Select an OBS bucket to store the file. Click Bucket ACL Info to check whether a public OBS bucket is selected.</p> <ul style="list-style-type: none"> SAFE: The bucket ACL permission set does not contain ALL USERS. WARN: The bucket ACL permission set contains ALL USERS. UNKNOWN: The bucket ACL permission set is unknown, maybe due to the lack of IAM permissions. You are advised to go to the OBS page to view the bucket ACL configuration.
Keyspace	Select the keyspace that you want to import the file to.
Charset	Select a charset as needed.
Options	<p>If you select Ignore errors, that is, skip the step where the SQL statement fails to be executed, the system will skip any errors detected when SQL statements are being executed.</p> <p>If you select Delete the uploaded file upon an import success, the file you uploaded will be automatically deleted from the OBS bucket after being imported to the destination database. This option is only available to the files uploaded from your local PC.</p>
Remarks	Enter remarks as required.

Step 8 After setting import parameters, click **Create**.

Confirm the information again before you click **OK** because original data may be overwritten after data import.

Step 9 On the displayed page, view import progress in the task list.

Click **Details** in the **Operation** column to view task details.

----End

9.7.2 Exporting Data

DAS allows you to export a large amount of data at a time to facilitate data query or to back up data for migration. This section describes how to export data.

DAS allows you to export an entire keyspace, some data tables, or result sets of CQL statements.

Usage Notes

- If you do not select **Generate a file for each table** when exporting data, the exported data file is in **.zip** format. Data files in this format cannot be directly imported. You need to decompress the file before importing it again.
- If **Generate a file for each table** is selected during data export, the exported data file is in **.sql** or **.csv** format. In this case, the exported data file can be directly imported again.
- Only OBS buckets of the current IAM account can be exported.

Prerequisites

You have created a user keyspace on the DAS console.

Exporting a Keyspace



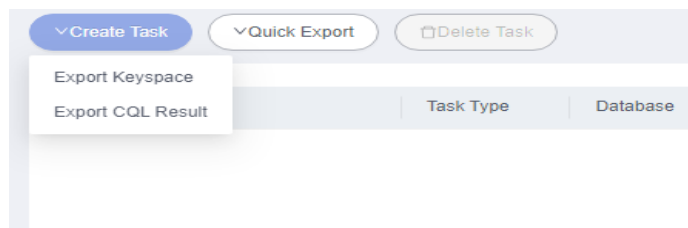
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Import and Export > Export**.
- Step 7** In the upper left corner of the page, click **Create Task** and choose **Export Keyspace**.

Figure 9-27 Creating a task for exporting a keyspace



Step 8 In the displayed dialog box, configure basic information and advanced settings as required.

Figure 9-28 Creating a task for exporting a keyspace

- If you select **Export all tables**, data in an entire keyspace or in some tables will be exported.
- DAS does not store any user data. The exported data files are stored in the OBS bucket that you have created.
- You can click **Bucket ACL Info** in the **Create Task** dialog box to check whether a public OBS bucket is selected.
- Creating OBS buckets is free of charge, but saving files will incur certain costs.

Step 9 After settings are complete, click **OK**.

Step 10 In the task list, locate the created task and view the task ID, type, status, and progress.


Step 11 Click **Details** in the **Operation** column to view task details.

----End

Exporting CQL Results

Step 1 [Log in to the Huawei Cloud console](#).

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

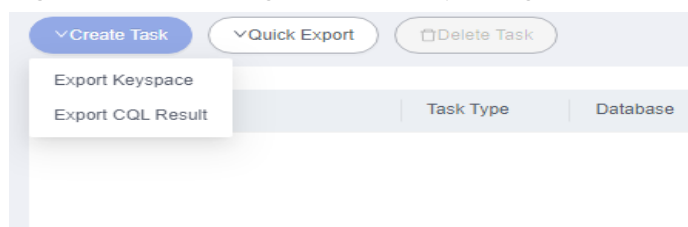
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

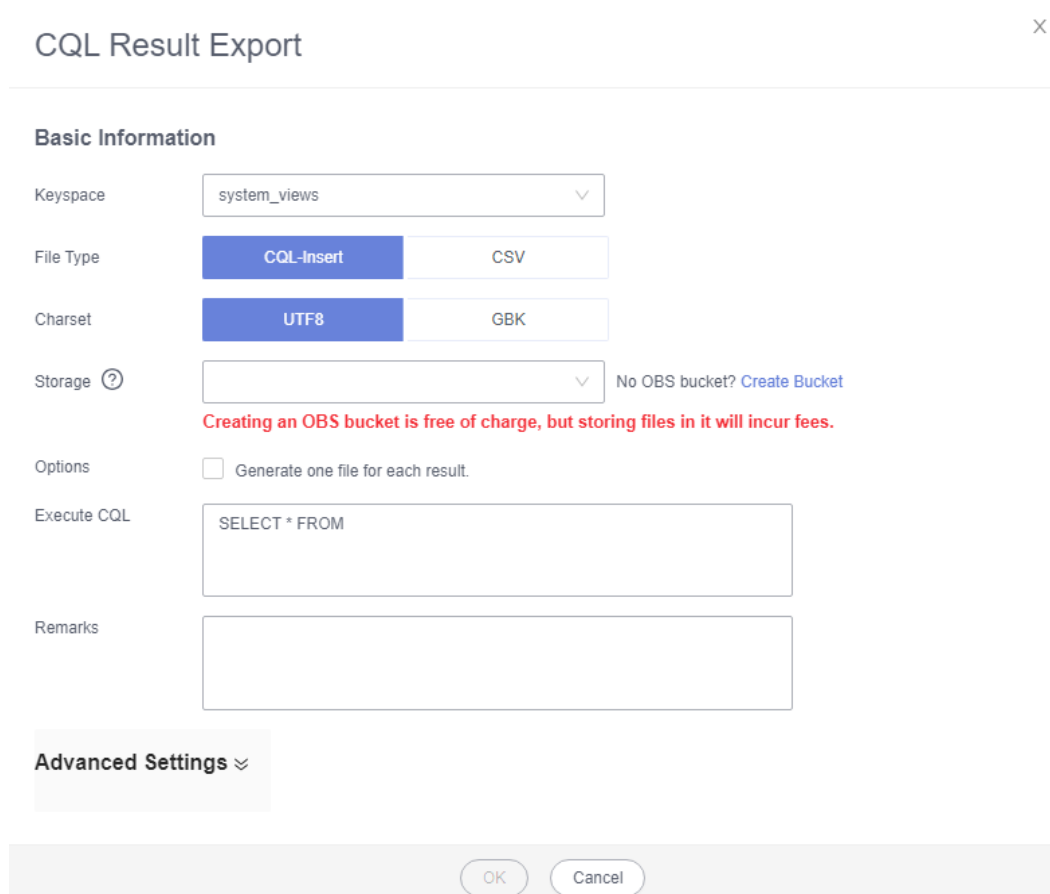
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Import and Export > Export**.
- Step 7** In the upper left corner of the page, click **Create Task** and choose **Export CQL Result**.

Figure 9-29 Creating a task for exporting a CQL result



- Step 8** In the displayed dialog box, configure basic information and advanced settings as required.

Figure 9-30 Creating an export task



- DAS does not store any user data. The exported data files are stored in the OBS bucket that you have created.
- You can click **Bucket ACL Info** in the **Create Task** dialog box to check whether a public OBS bucket is selected.

- Creating OBS buckets is free of charge, but saving files will incur certain costs.

Step 9 After settings are complete, click **OK**.

Step 10 In the task list, locate the created task and view the task ID, type, status, and progress.

Step 11 Click **Details** in the **Operation** column to view task details.

----End

Download Data File


Data exported using the data export function is stored in the OBS bucket you created. You can download exported data files in any of the following ways:

- Download on the DAS Console.
- Download on the OBS management console.

Quick Export (Not Promoted)

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

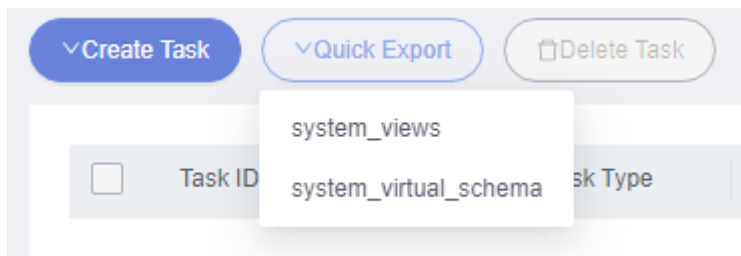
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Import and Export > Export**.

Step 7 In the upper left corner of the page, click **Quick Export** and select the keyspace that you want to export data from.

Figure 9-31 Quick export

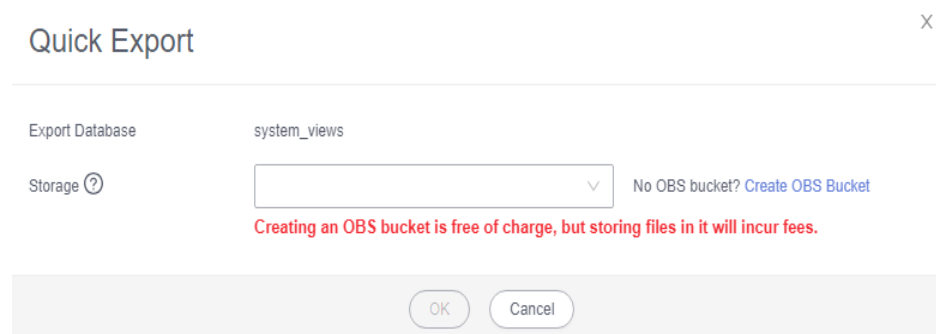


NOTE

A maximum of 200,000 rows can be quickly exported from a single table. To export more data, choose **Create Task > Export Database**.

Step 8 On the **Quick Export** page, select a storage path and click **OK**.

Figure 9-32 Quick export



Step 9 In the task list, view the export task you created.

In the row that contains the export task, you can click **Details** in the **Operation** column to view execution details of the task and information about exported tables.

----End

10 GaussDB(DWS) (Unavailable Soon)

10.1 Overview



GaussDB(DWS) is developed based on the open-source PostgreSQL ecosystem. DAS, commonly used for cluster connection, works with many engines and uses open-source components. So, GaussDB(DWS) syntax is not completely compatible with DAS syntax, which can cause some function issues and make it hard to adapt to DAS. GaussDB(DWS) only allows users to perform cluster O&M operations. To use clusters for data access, development, and processing, users had to rely on different services with limited functions. Now GaussDB(DWS) provides the online SQL editor, a one-stop development tool for data development, access, and processing. For details, see [GaussDB\(DWS\)](#).

10.2 Database Management

10.2.1 Creating a Database

This section describes how to create a database on the DAS console.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 In the database list of the **Home** page, click **Create Database**.

Figure 10-1 Create Database

Database List

[+ Create Database](#) User da

Database Name	Table Quantity	Table Size	Index Size	Character Set	Operation
gaussdb	1	96KB	0B	SQL_ASCII	Manage Query SQL Statements Delete
test	--	--	--	UTF8	Manage Query SQL Statements Delete

Step 7 In the displayed dialog box, enter a database name, select a character set, and configure other parameters as required.

Figure 10-2 Creating a database

×

Create Database

*** Name**

Only user databases can be created

Character Set

Template

Collation

Ctype

DBCMPATIBILITY

OK
Cancel

Step 8 Click **OK**. The database you created is displayed in the database list.

----End

10.2.2 Deleting a Database

This section describes how to drop a database that is no longer needed.

Precautions

All data in the database and the database will be deleted and cannot be restored.

Procedure



- Step 1** Log in to the Huawei Cloud console.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** In the database list, locate the database you want to delete and click **Delete** in the **Operation** column.

Figure 10-3 Deleting a database



Database Name	Table Quantity	Table Size	Index Size	Character Set	Operation
gaussdb	1	99KB	0B	SQL_ASCII	Manage Query SQL Statements Delete
test	--	--	--	UTF8	Manage Query SQL Statements Delete

- Step 7** In the displayed dialog box, click **Yes**.
----End

10.3 SQL Operations

10.3.1 SQL Window

DAS allows you to easily run various SQL statements in a graphical SQL window and to perform operations on databases, such as adding, deleting, editing, and viewing a database.

Introduction to SQL Window

Figure 10-4 SQL window

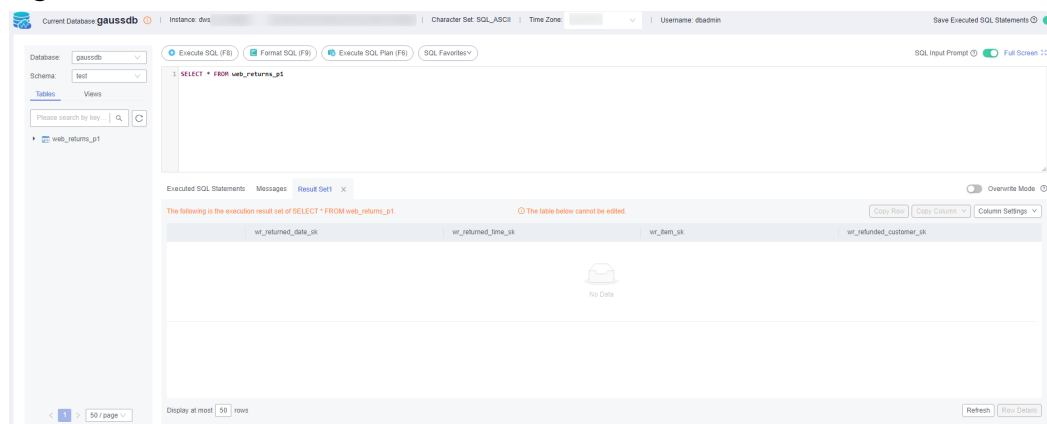



Table 10-1 Function description

Function	Description
Execute SQL	Executes SQL statements. SQL operations are performed on tables and views in a database.
Format SQL	Improves readability of SQL statements. Formatting SQL statements enables statements to be displayed in line break mode, but does not change their logic and semantics. SQL formatting takes effect for all the SQL statements in the SQL window. You cannot format only one selected statement.
SQL Favorites	Allows you to add, view, and manage frequently-used SQL statements.
Save Executed SQL Statements	After this function is enabled, the system saves the recently executed SQL statements to the server.
SQL Input Prompt	Helps you quickly enter a specific database, table, or field name when you enter a SQL statement in the SQL window.
Full Screen	Shows SQL statements on a full screen.
SQL History	Shows the SQL execution details.
Messages	Shows SQL execution outputs.
Overwrite/Append Mode	<ul style="list-style-type: none">● Append Mode: Each time a SQL statement is executed, the new result set is appended to the previous one.● Overwrite Mode: Each time a SQL statement is executed, the new result set overwrites the previous one.

Opening the SQL Window

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.


----End

10.3.2 Executing SQL Statements

Procedure

Step 1 Log in to the Huawei Cloud console.

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

Step 7 Select a database and schema from the navigation tree on the left.

Step 8 Enter a SQL statement in the SQL window and click **Execute SQL**.

- Enabling **SQL Input Prompt** is recommended. It helps you select the required database, table, or field name when you enter a SQL statement in the SQL window.
- If you want to execute multiple SQL statements at a time, separate them using semicolons (;) and click **Full Screen** to view logics in the SQL statements.
 - To execute some of the SQL statements, select the statements before executing them.
 - To execute all SQL statements, do not select any SQL statements or select all SQL statements.

NOTE

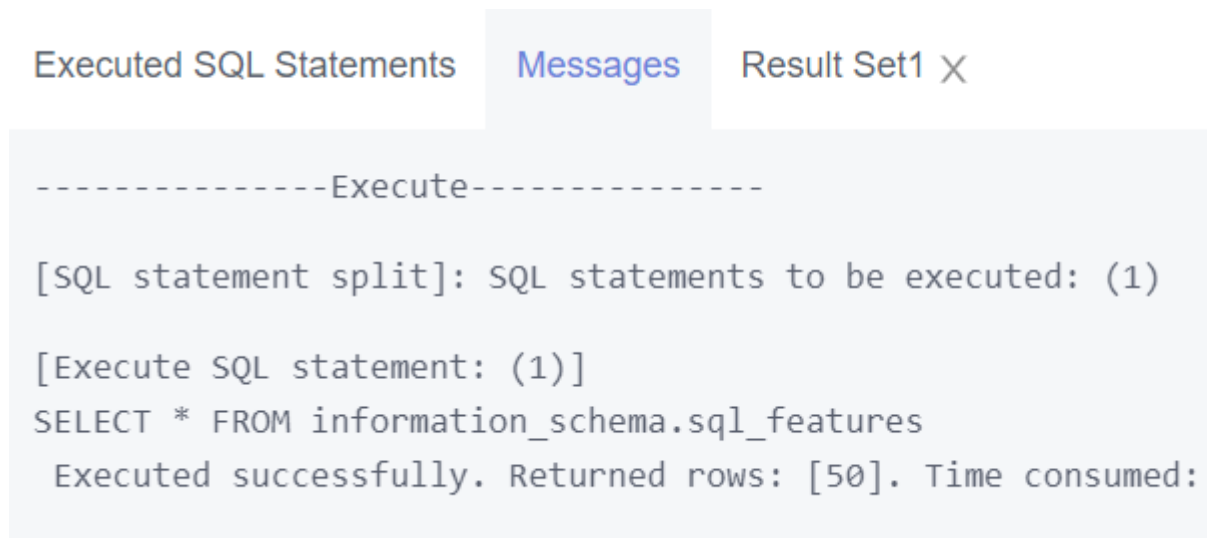
If there are special characters in a table or field name in a SQL statement, make sure that they use double quotation marks.

Example:

```
SELECT * FROM "case_insensitive_tb1!~@#$%^&*)_(_  
+ASDHBHYZXfadsdjalskjfdlajlcakl";
```

Step 9 View execution details of the current SQL statement and previously executed SQL statements in the lower part of the page.

Step 10 Click the **Messages** tab, view SQL execution details, including affected rows, progress, and time required.

Figure 10-5 Viewing messages

Step 11 On the **Result Set** tab, view SQL execution results. You can perform the following operations on the result sets:

- **Copy Row/Copy Column:** copies a row or column for reuse.
- **Column Settings:** customizes the columns to display when there are a large number of columns in the query result.
- **Refresh:** refreshes the changed data.
- **Row Details:** displays the column field name, value, and type of the selected row.
- **Export:** The SQL, CSV, and Excel files are supported. No more than 7.84 MB of data with 10,000 records can be exported. The actual size of an Excel file may exceed 7.84 MB due to its format.

----End


10.3.3 Executing SQL Plan

This section describes how to analyze the execution efficiency of a SQL statement.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

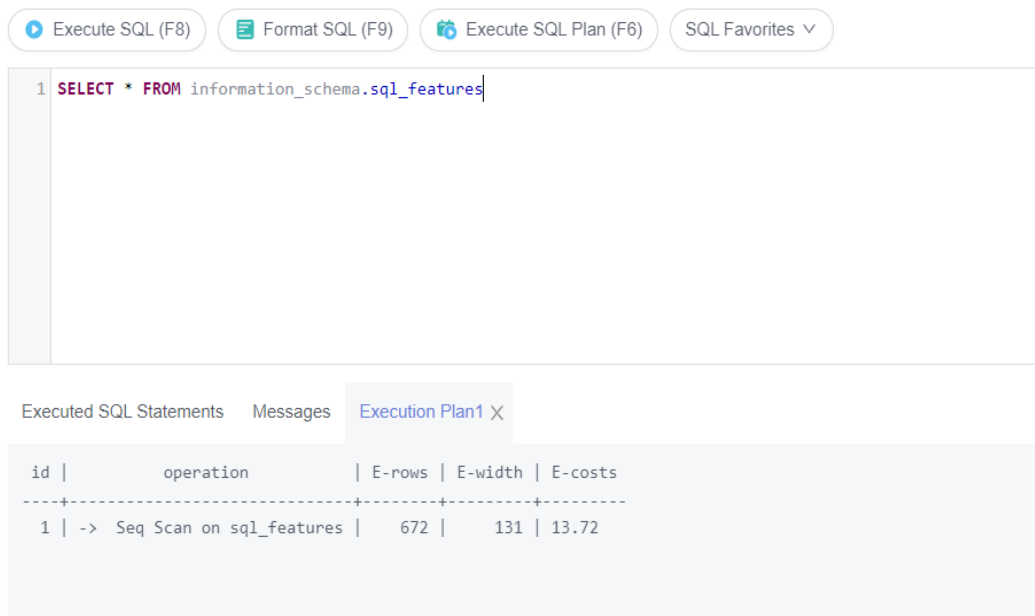
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- Step 7** Select a database and schema from the navigation tree on the left.
- Step 8** Enter a SQL statement in the SQL window and click **Execute SQL Plan**.

Figure 10-6 Executing SQL plan



- On the **Executed SQL Statements** tab page, view SQL execution history.
- On the **Messages** tab page, view the execution information, including SQL splitting, execution status, and elapsed time.
- On the **Execution Plan** tab page, view SQL execution details. Execution plan details of SQL statements are displayed on different tabs.

----End

10.3.4 SQL Favorites

This section describes how to add frequently-used SQL statements and view and manage them.

Procedure

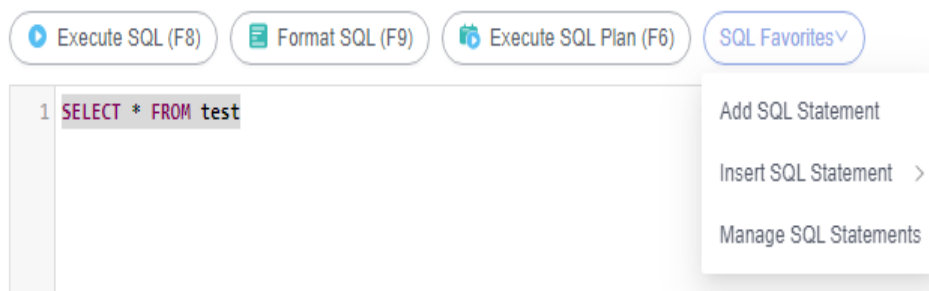
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

Step 7 In the SQL window, click **SQL Favorites**.

Figure 10-7 SQL favorites



- **Add SQL Statement:** allows you to add frequently-used SQL statements. Specifically, specify a title, select an application scope, enter SQL statements, and then click **Save**.

Figure 10-8 Adding a SQL statement

Add SQL Statement

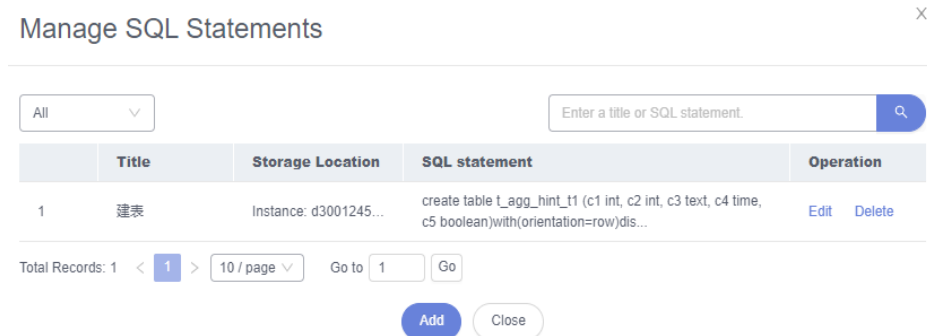
* Title:

Application Scope: All DB instances Current DB instance Current database

* SQL statement:

```
1 SELECT * FROM information_schema.sql_features|
```

- **Insert SQL Statement:** allows you to view the SQL statements you have added. If there are no SQL statements stored in your account, this option will not be displayed.
- **Manage SQL Statements:** allows you to manage frequently used SQL statements, including adding, editing, and deleting statements.

Figure 10-9 Managing SQL statements

----End

10.3.5 Executed SQL Statements

After you enable Save SQL to Execution Record, DAS saves the SQL statements executed in the SQL window for future query. You can also run these SQL statements again without entering them again.


Prerequisites

You have enabled **Save Executed SQL Statements** in the upper right corner of the **SQL Query** page. After this function is enabled, executed SQL statements will be saved on the DAS management host.

Constraints on Usage

SQL statement execution records can be stored for up to one year.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL History**.
- Step 7** On the displayed page, search for execution information about the target SQL statement by time range, database name, or keyword.
 - To access the **Database Management** page, click a database name.
 - To copy a SQL statement, click it in the **SQL Statement** column.

- To execute a SQL statement, click **Open in SQL window** in the **Operation** column.

----End

10.4 Table Management

10.4.1 Opening a Table

Graphical window for creating a GaussDB(DWS) table is not available. To create a table, execute SQL statements in the SQL window. For details, see [Executing SQL Statements](#).

After a table is created, you can open the table on the DAS console and view data in the table.

Procedure



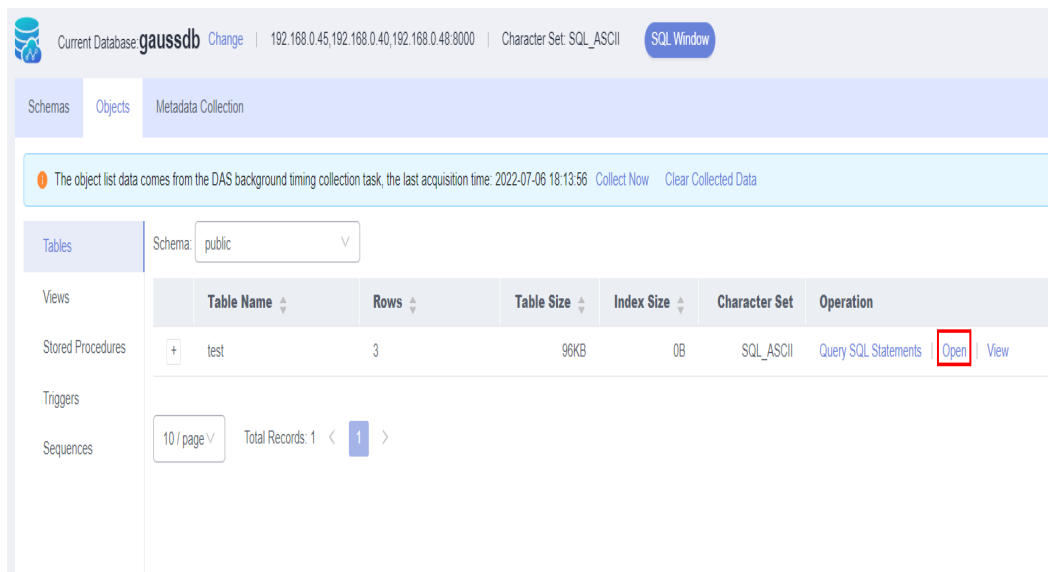
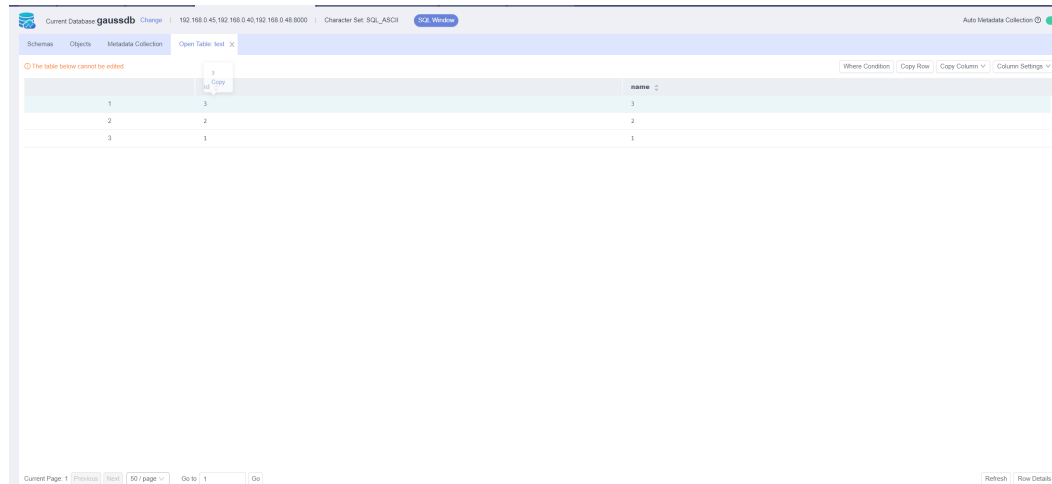
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab, choose **Tables** on the left. In the table list, locate the table you want to open, and click **Open** in the **Operation** column.

Figure 10-10 Opening a table



Step 8 On the table details page, specify the rows to be displayed. You can also copy and reuse rows and columns.

Figure 10-11 Table details page



You can also perform the operations listed in [Table 10-2](#).

Table 10-2 UI operations

Name	Description
Where Condition	Filters records.
Copy Row	Copies data of the selected row. Specifically, double-click the target row and then click Copy Row .
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.
Column Settings	Allows you to set the columns you want to display.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.

----End

10.4.2 Viewing Details of a Table

This section describes how to view table information and the SQL statement for creating this table.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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


- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab, choose **Tables** on the left. In the table list, locate the table whose details you want to view and click **View** in the **Operation** column.

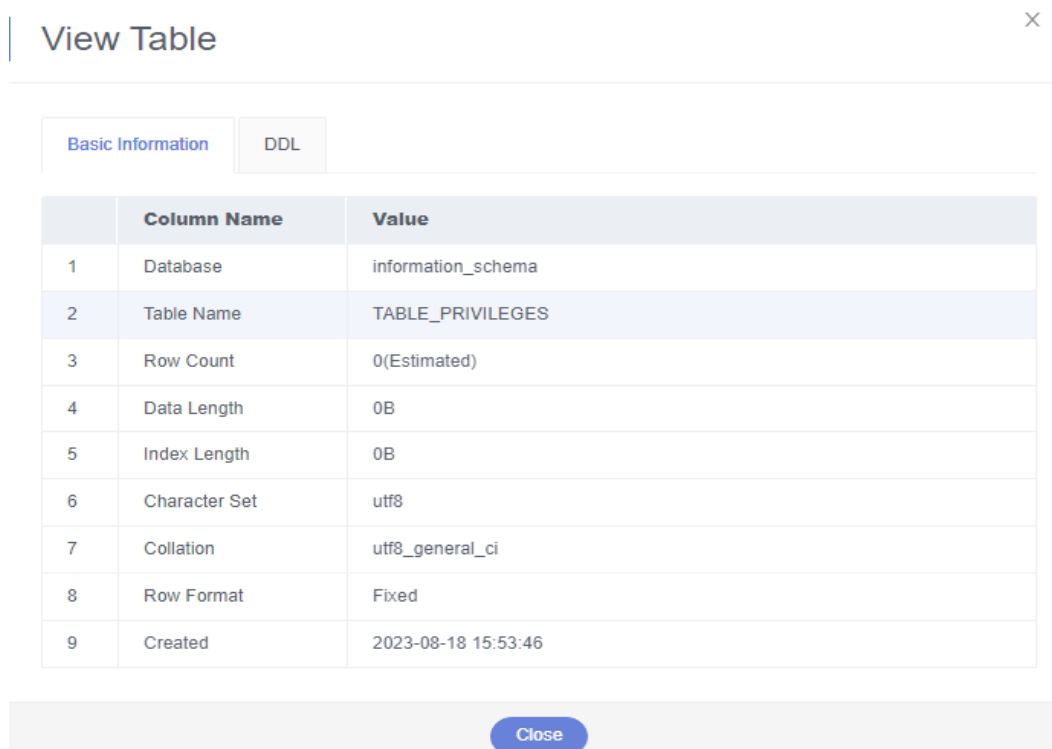
Figure 10-12 Viewing details of a table



Table Name	Rows	Table Size	Index Size	Character Set	Operation
test	0	0B	0B	SQL_ASCII	Query SQL Statements Open View

- Step 8** In the displayed dialog box, view basic information of the table.

Figure 10-13 Viewing details of the table



View Table ×

Basic Information
DDL

	Column Name	Value
1	Database	information_schema
2	Table Name	TABLE_PRIVILEGES
3	Row Count	0(Estimated)
4	Data Length	0B
5	Index Length	0B
6	Character Set	utf8
7	Collation	utf8_general_ci
8	Row Format	Fixed
9	Created	2023-08-18 15:53:46

Close

----End

10.5 View Management

10.5.1 Opening a View

Graphical window for creating a GaussDB(DWS) view is not available. To create a view, execute SQL statements in the SQL window. For details, see [Executing SQL Statements](#).

This section describes how to open a view in a GaussDB(DWS) database on DAS.

Procedure



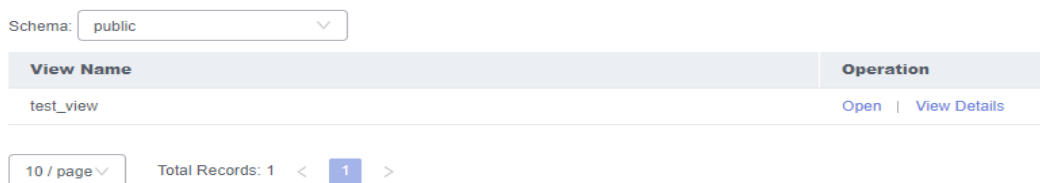
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** page, choose **Views**. In the right pane, locate the view that you want to open and click **Open** in the **Operation** column.

Figure 10-14 Opening a view



- Step 8** On the displayed page, check view details.

You can also perform the operations listed in [Table 10-3](#).

Table 10-3 UI operations

Name	Description
Where Condition	Filters records.
Copy Row	Copies data of the selected row. Specifically, double-click the target row and then click Copy Row .
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.
Column Settings	Allows you to set the columns you want to display.

Name	Description
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.

----End

10.5.2 Viewing Details of a View

This section describes how to view details of a view on the DAS console.

Procedure



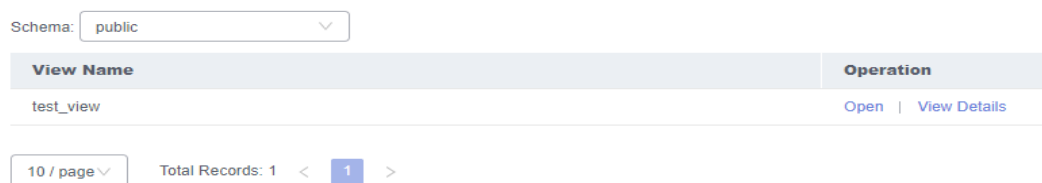
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab, choose **Views** on the left. In the right pane, locate the view whose details you want to view and click **View Details** in the **Operation** column.

Figure 10-15 Viewing details of a view



- Step 8** In the displayed dialog box, view the SQL statement used to create the view.

----End

10.6 Stored Procedure Management

10.6.1 Creating a Stored Procedure

A stored procedure consists of a set of SQL statements that can complete specific tasks or process complex services. This section describes how to create a stored

procedure. You can use loop statements in a stored procedure to insert objects repeatedly.


Prerequisites

- You have obtained the CREATE ROUTINE permission.
- You have obtained the EXECUTE permission.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

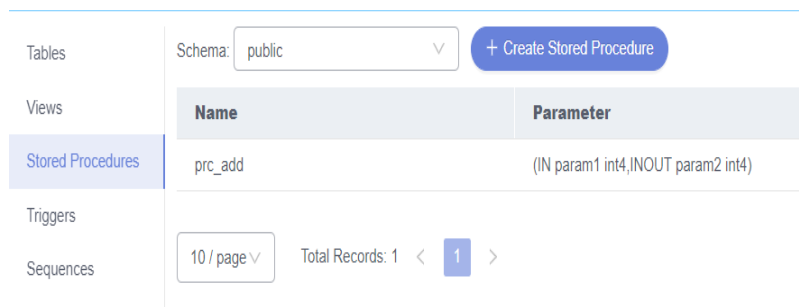
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 On the displayed **Objects** page, select **Stored Procedures**. In the upper left corner of the page, click **Create Stored Procedure**.

Figure 10-16 Stored procedure list



Name	Parameter
prc_add	(IN param1 int4, INOUT param2 int4)

Step 8 In the displayed dialog box, enter a stored procedure name, select a type, and click **OK**.

Figure 10-17 Creating a stored procedure

Step 9 On the stored procedure setting page, enter the required information and click **Save**.

----End

10.6.2 Altering or Executing a Stored Procedure

This section describes how to alter or execute a stored procedure on the DAS console.


Usage Notes

Improper alterations on a stored procedure will cause instance or service exceptions.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

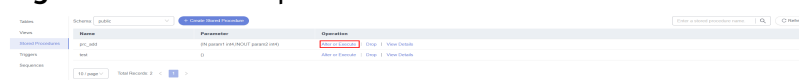
Step 2 Click  in the upper left corner and select a region and project.

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.

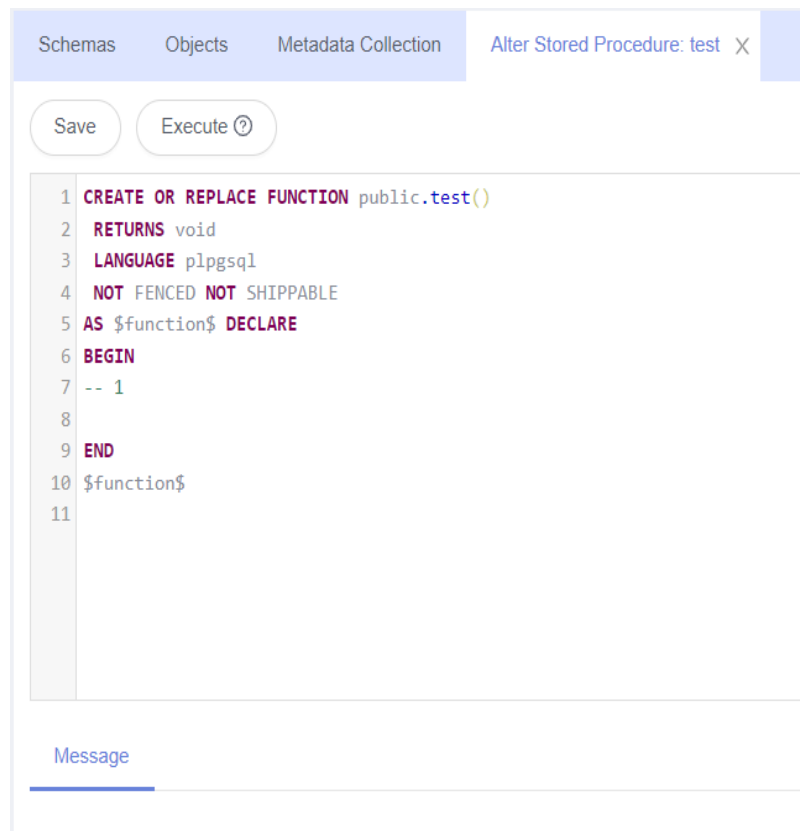
Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**. On the displayed **Objects** page, choose **Stored Procedures**, locate the store procedure you want, and click **Alter or Execute** in the **Operation** column.

Figure 10-18 Stored procedure list

Step 7 On the displayed page, enter the required SQL statement and click **Save**.

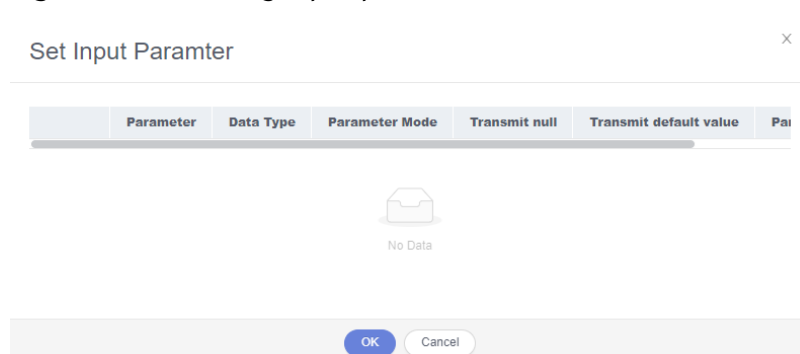
Figure 10-19 Altering or executing a stored procedure



Step 8 Click **Execute** to set the input parameters of the stored procedure.

Step 9 Ensure that the settings are correct and click **OK**.

Figure 10-20 Setting input parameters





Step 10 After the SQL statement is executed, view the execution status on the **Messages** page.

----End

10.6.3 Viewing Details of a Stored Procedure

This section describes how to view details of a stored procedure.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)
 - Step 2** Click  in the upper left corner and select a region and project.
 - Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
 - Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
 - Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
 - Step 6** On the top menu bar, choose **Database Management**.
 - Step 7** On the **Objects** tab page, choose **Stored Procedures**.
 - Step 8** Locate the stored procedure whose details you want to view and click **View Details** in the **Operation** column.
- End

10.6.4 Dropping a Stored Procedure

This section describes how to drop a stored procedure that is no longer needed.

Precautions

Dropped stored procedures cannot be recovered. Exercise caution when performing this operation.

Procedure



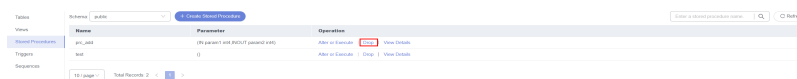
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** page, choose **Stored Procedures**. In the right pane, locate the stored procedure you want to drop and click **Drop** in the **Operation** column.

Figure 10-21 Dropping a stored procedure

Step 8 In the displayed dialog box, click **Yes**.

----End

10.7 Trigger Management


10.7.1 Viewing Details of a Trigger


Graphical window for creating a GaussDB(DWS) trigger is not available. To create a trigger, execute SQL statements in the SQL window. For details, see [Executing SQL Statements](#).

This section describes how to open and view a created GaussDB (DWS) trigger on DAS.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 On the **Objects** tab page, choose **Triggers**.

Step 8 In the right pane, locate the trigger whose details you want to view and click **View Details** to view the SQL statement used to create the trigger.

----End

10.8 Sequence Management

10.8.1 Viewing Details of a Sequence

Graphical window for creating a GaussDB(DWS) sequence is not available. To create a sequence, execute SQL statements in the SQL window. For details, see [Executing SQL Statements](#).

After a sequence is created, you can view the SQL statement for creating the sequence on the DAS console.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the **Objects** tab page, choose **Sequences**.

Figure 10-22 Sequence list



Sequence Name	Data Type	Starting Value	Increment	Operation
serial	bigint	101	1	View Details

- Step 8** In the right pane, locate the sequence you want to view and click **View Details** in the **Operation** column.

Figure 10-23 Viewing details of a sequence

View Details

```
1 CREATE SEQUENCE "public"."serial"  
2 INCREMENT 1  
3 MINVALUE 1  
4 MAXVALUE 9223372036854775807  
5 START 101  
6 NOCYCLE;
```

----End

10.9 Operation Audit


DAS records the login, logout, creation, deletion, and query operations. The records include the username, function module, operation content, database

name, cluster information, login database name, operation time, and execution status.

Operation record viewing

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Operation Audit**.


Step 7 Search for operation records by operation type or operation time.


----End

Exporting Audit Records

The export function allows you to filter data in the audit list and export it to a CSV file in asynchronous mode. That is, you need to save the file to OBS and then download it to a local PC.

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Operation Audit**.

Step 7 Click **Export** in the upper right corner to add an asynchronous export task.


Step 8 Click **View Export History** in the upper right corner of the list to view the asynchronous export progress. Wait until the task is complete.


Step 9 In the **View Export History** dialog box, locate the row that contains the target task and click **Download** in the **Operation** column to download the CSV file to the local PC.

----End

Deleting Export Records

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Operation Audit**.

Step 7 Click **View Export History** in the upper right corner of the list.

Step 8 Select export tasks and click **Delete Task** in the upper right corner of the list. You can determine whether to delete files in the OBS bucket at the same time. Select **Delete files in the OBS bucket** as required.

----End

11 DDS

11.1 Account Management

11.1.1 User Management

Multiple users with different permissions can be created to access a DB instance or database, but the permissions of these users must be within a certain range.

Creating a User



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > User Management**.
- Step 7** Select the database for which a user is to be created and click **Create User**.

Figure 11-1 Creating a user



- Step 8** On the displayed page, enter the username and password and confirm the password.

Figure 11-2 Setting information

The screenshot shows the 'Create User' interface. At the top, there is a header 'Create User' with a back button '< Back to User Management List'. Below the header are four required input fields: '* Current Database:' (with 'admin' selected), '* Username:', '* Password:', and '* Confirm Password:'. Underneath these fields are two tabs: 'Role' (selected) and 'Custom Data'. Below the 'Role' tab are two buttons: 'Add Roles' and 'Delete Roles'. At the bottom of the form is a table with a checkbox in the first column, and two columns labeled 'Role Name' and 'Database Name'.

Step 9 In the lower part of the page, click **Add Role**. On the displayed page, select roles for the database.

Figure 11-3 Adding roles

The screenshot shows the 'Add Roles' dialog box. It has a title bar with 'Add Roles' and a close button 'X'. Below the title bar is a 'Select Database:' dropdown menu with 'admin' selected. Below that is a 'Select Roles:' text input field. At the bottom of the dialog, there are two buttons: 'Add' and 'Cancel'.

NOTE

If you grant a role from another database to this created user, the user has operation permissions on that database.


Step 10 After setting required parameters, click **Save**. In the preview dialog box, click **OK**.

----End

Editing a User

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.



- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > User Management**.
- Step 7** In the user list, locate the user that you want to edit and click **Edit** in the **Operation** column.

Figure 11-4 Editing user information



- Step 8** Edit user information, such as the password, associated role, and user-defined data.
 - Step 9** Click **Save**.
- End


Deleting a User

- Step 1** [Log in to the Huawei Cloud console](#).
 - Step 2** Click  in the upper left corner and select a region and project.
 - Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
 - Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
 - Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
 - Step 6** On the top menu bar, choose **Account Management > User Management**.
 - Step 7** In the user list, locate the user you want to delete and click **Delete**.
 - Step 8** In the displayed dialog box, click **Yes**.
- End

11.1.2 Role Management

This section describes how to create one or more roles and grant different permissions to each role.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.


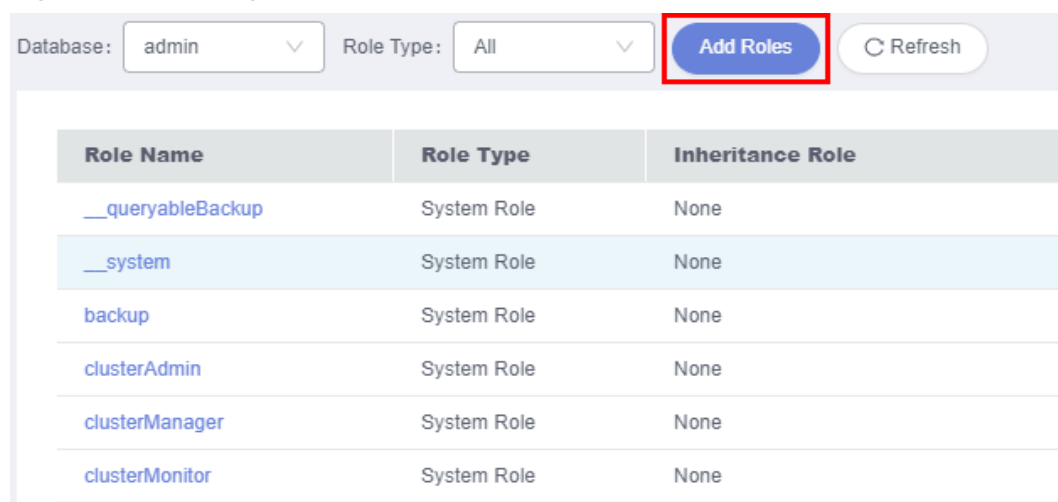
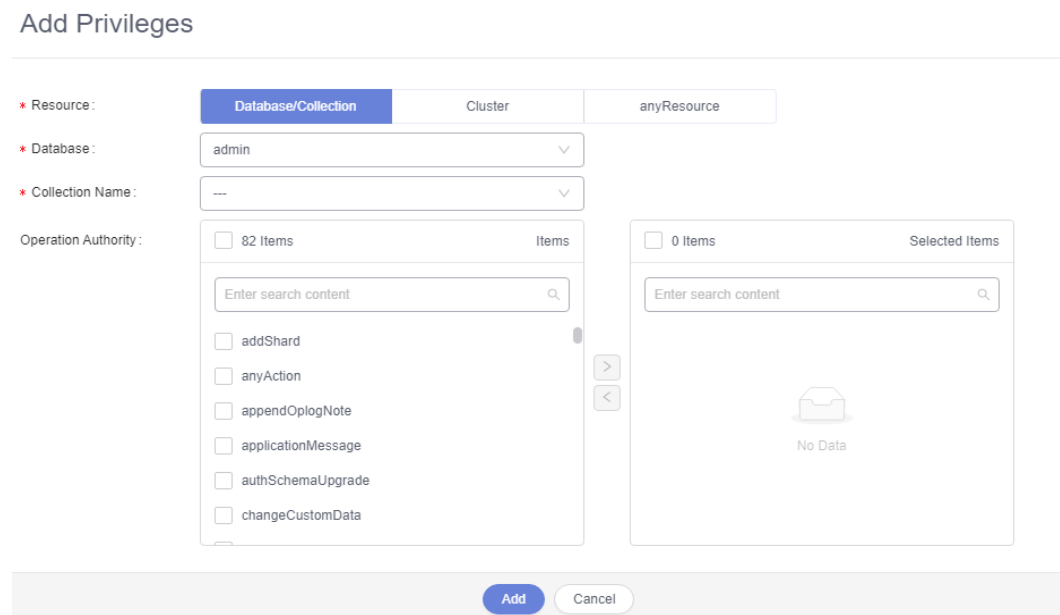
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > Role Management**.
- Step 7** Select the database for which the roles are to be created and click **Add Roles**.

Figure 11-5 Adding roles



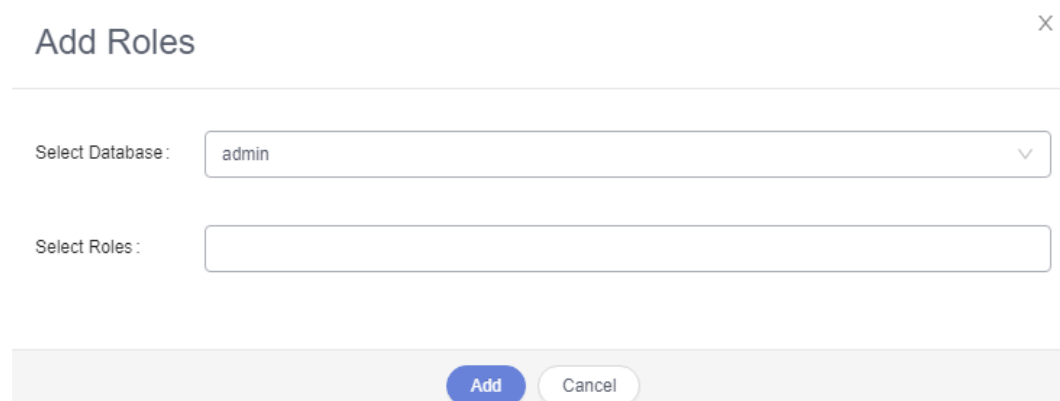
- Step 8** Enter a role name.
- Step 9** On the **Permission** tab page, click **Add Privileges**. In the displayed dialog box, specify required parameters and click **Add**.

Figure 11-6 Adding privileges



Step 10 (Optional) On the **Role** tab page, click **Add Roles**. On the displayed page, select the roles you want to add and click **Add**.

Figure 11-7 Viewing details



Step 11 After setting the roles, click **Save**.

NOTE

If a role is created for the admin database, you can select other databases when adding permissions or roles, to grant the permissions of other databases to this role. Users with this role have the permissions to operate the selected database.

----End

11.2 Database Management

11.2.1 Creating a Database

This section describes how to create a database on the DAS console.

Procedure



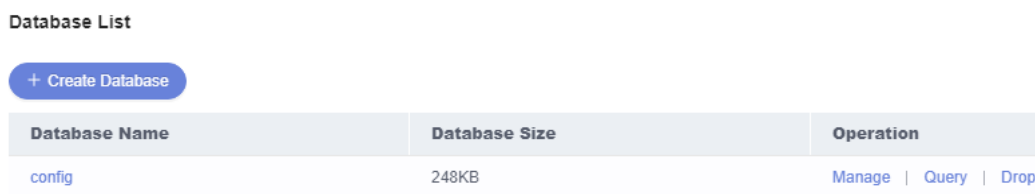
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** In the database list of the **Home** page, click **Create Database**.

Figure 11-8 Creating a database



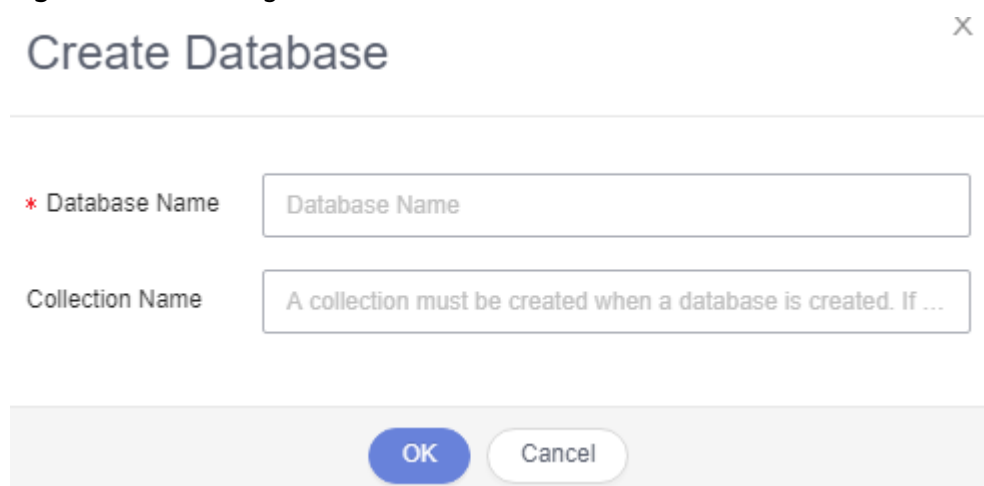
Database List

[+ Create Database](#)

Database Name	Database Size	Operation
config	248KB	Manage Query Drop

- Step 7** On the displayed page, enter a database name and collection name (optional).

Figure 11-9 Creating a database



Create Database X

* Database Name

Collection Name

- Step 8** Click **OK**. View the created database in the database list.

----End

11.2.2 Dropping a Database

This section describes how to drop a database that is no longer needed.

Precautions

Dropped databases cannot be recovered. Exercise caution when performing this operation.

Procedure



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** In the database list, locate the database you want to delete and click **Drop** in the **Operation** column.

Figure 11-10 Dropping a database

Database List

[+ Create Database](#)

Database Name	Database Size	Operation
config	248KB	Manage Query Drop

- Step 7** In the displayed dialog box, click **Yes**.

----End

11.3 Command Operation

11.3.1 Command Query

DAS manages database collections and views through SQL statements, facilitating user operations.

Precautions

- The `timestampe()` command is not supported.

- The **db.collection.aggregate()** command is not supported. You can run the **db.runCommand** command instead. The following is an example about how to use syntax:

```
db.runCommand({
  aggregate: "collection",
  pipeline: [{
    "$match": {
      "time": {
        "$gte": 20.0
      }
    }
  },
  {
    "$sort": {
      "time": -1.0
    }
  }
  ]
});
```

Procedure



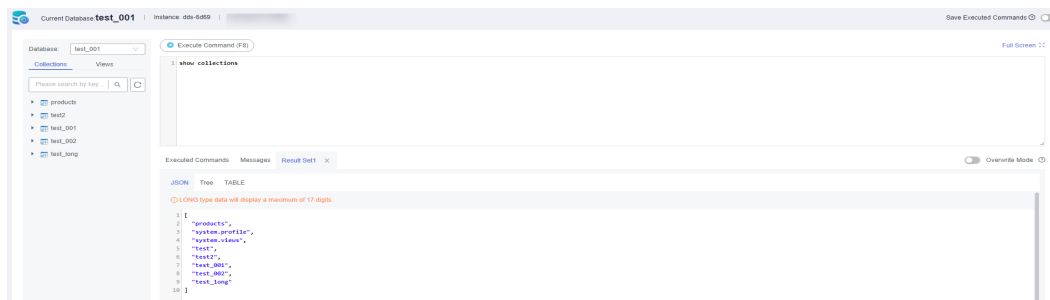
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Command Operation > Command Window**.
- Step 7** In the displayed text box, enter the commands you want to execute and click **Execute Command**.

Figure 11-11 Executing a command



You can also perform the operations listed in [Table 11-1](#) on the command query page.

Table 11-1 Function description

Function	Description
Executing Command	Executes commands. Commands are performed on collections and views in a database.
Full Screen	Shows commands on a full screen.
Save Executed Commands	After this function is enabled, the system saves the recently executed commands to the server.
Executed Commands	Shows the command execution details.
Messages	Shows the command output.
Result Set	Shows the command execution result.
Overwrite/Append Mode	<ul style="list-style-type: none">● Append Mode: Each time a command is executed, the new result set is appended to the previous one.● Overwrite Mode: Each time a command is executed, the new result set overwrites the previous one.
Export of the query result set	Used to export the query result set. A maximum of 1000 records can be exported at a time.

----End

11.3.2 Command History

After you toggle on **Save Executed Commands**, DAS will save the commands you executed in the SQL window for future view. You can also execute the commands again with no need to enter them again in the SQL window.

Prerequisites


You have enabled **Save Executed Commands**.

After you enable **Save Executed Commands**, executed commands will be recorded in the DAS management host.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

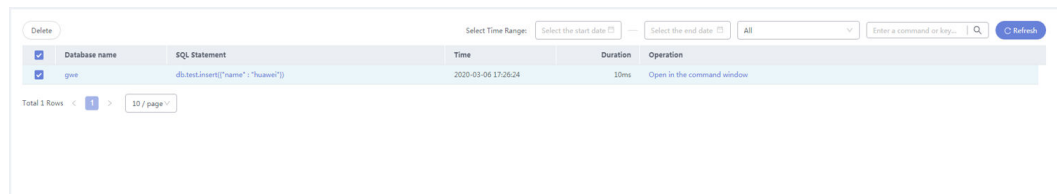
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Command Operation > Command History**.
- Step 7** In the command execution list, view the execution records.

Figure 11-12 Command execution list



Database name	SQL Statement	Time	Duration	Operation
gao	db.test.insert('name','huawei')	2020-03-06 17:26:24	10ms	Open in the command window

- You can search execution records by time range, database name, or command keyword.
- **Database name:** Click a database name to go to the database management page.
- **SQL Statement:** Click a statement to view or copy it.
- **Open in command window:** Click it to view the executed commands in a window for easy view and use.

----End

11.4 Collection Management

11.4.1 Creating a Collection

This section describes how to create a collection on the DAS console.

Procedure



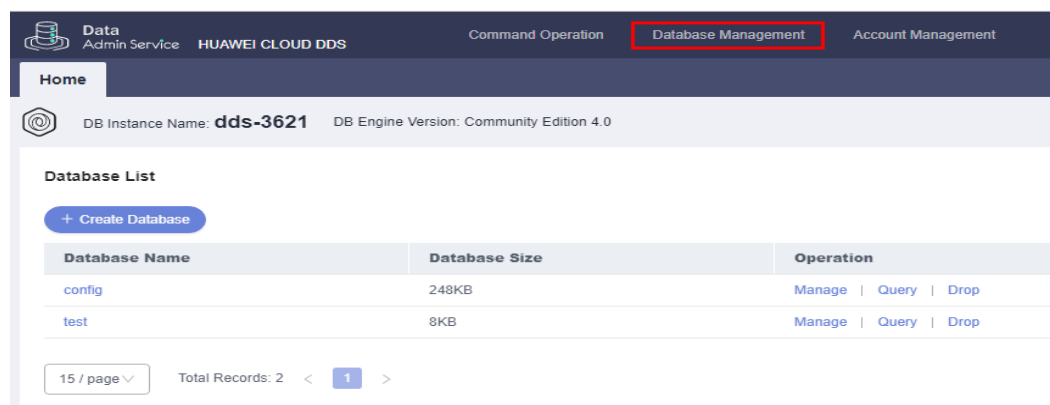
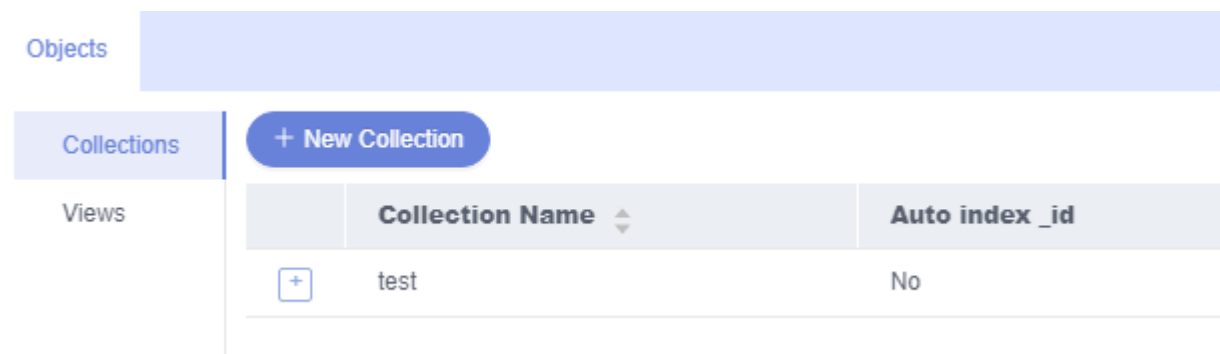
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.

Figure 11-13 Database list



Step 7 On the **Collections** tab page, click **New Collection**.

Figure 11-14 Database management



Step 8 On the displayed page, enter a collection name. Select **Capped collection**, **Auto index_id**, and **No padding** as required.

Figure 11-15 Creating a collection

The screenshot shows a 'New Collection' dialog box. At the top, there is a title bar with the text 'New Collection' and a close button (X). Below the title bar, there is a text input field labeled '* Collection Name' with the placeholder text 'Collection Name'. Underneath the input field are three checkboxes: 'Capped collection' (unchecked), 'Auto index _id' (checked), and 'No Padding' (unchecked). Below these checkboxes is a section titled 'Validator Setting' with a small upward-pointing arrow. Underneath this section is a table with the following structure:

Validation Rule
1

At the bottom of the dialog box, there are two buttons: 'OK' and 'Cancel'.

- **Capped collection:** Set the maximum number of bytes and the maximum number of documents. If the specified value is reached, an error is reported. The value specified must be greater than 0.
- **Auto index:** Automatically create an index on the `_id` field.
- **No padding:** A storage policy that does not reserve storage space for the growth of a record when inserting it.

Step 9 Enter a validation rule and set **Validation Level** and **Validation Action**.

Figure 11-16 Validation rule

Validator Setting ^

Validation Rule

1

Validation Level

strict

Validation Action

error

 **NOTE**

- Options for **Validation Level** include:
 - **strict**: a strict validation level.
 - **moderate**: a moderate validation level.
 - **off**: no validation level.
- Options for **Validation Action** include:
 - **error**
 - **warn**

Step 10 Ensure that all the settings are correct and click **OK**. The collection you create appears in the collection list, and you can perform operations on it.

----End


11.4.2 Opening a Collection

This section describes how to view details about documents in a collection and create or delete documents on the DAS console.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

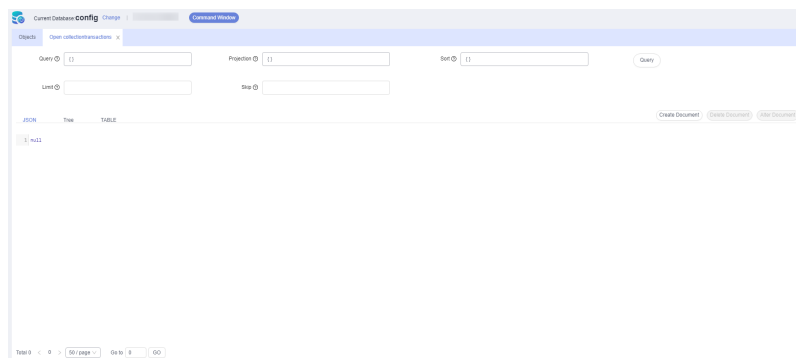
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab page, choose **Collections**, locate the target collection, and click **Open Collection** in the **Operation** column.
- Step 8** On the displayed page, you can perform the following operations:
 - Set parameters **Query**, **Projection**, **Sort**, **Limit**, and **Skip** to query the documents in the current collection.

Table 11-2 Parameter description

Parameter	Description
Query	Uses a query operator to specify the filter.
Projection	Specifies fields that matched with the query filter in the document to return.
Sort	Defines the sorting rule.
Limit	Specifies the maximum number of documents that can be returned.
Skip	Specifies the number of skipped documents.

- On the **JSON** tab page, view filtered documents.
- To facilitate viewing, DAS allows you to view the documents in Table and Tree mode. You can view text files on the **Tree** and **Table** tab pages.

Figure 11-17 Opening a collection



- You can create, delete, and view documents.

----End

11.4.3 Altering Validator

This section describes how to alter validation rules of a collection on the DAS console.

Procedure

- Step 1** [Log in to the Huawei Cloud console.](#)



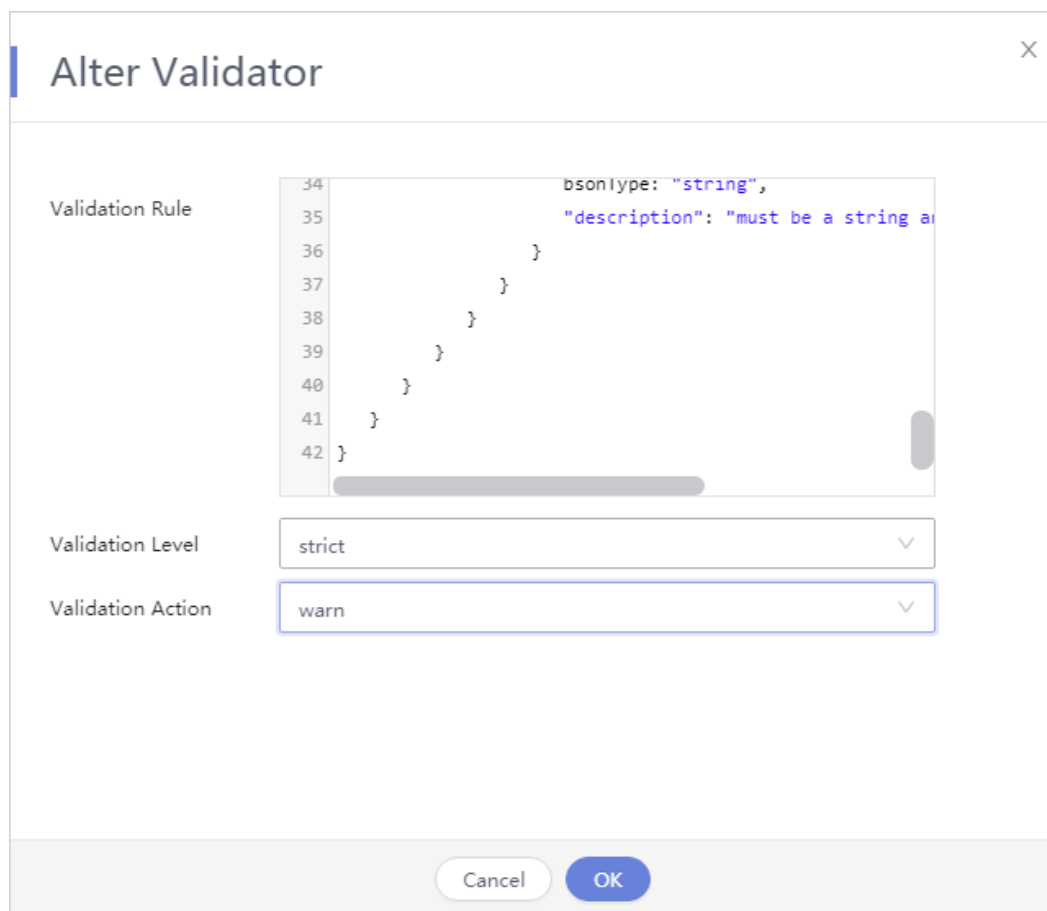
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab, choose **Collections**, locate your target collection and click **Alter Validator** in the **Operation** column.
- Step 8** On the displayed **Alter Validator** page, confirm the validation rule, and set the validation level and action.

Figure 11-18 Altering a validator





- Step 9** Click **OK**.

----End

11.4.4 Renaming a Collection

This section describes how to rename a collection on the DAS console.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
 - Step 2** Click  in the upper left corner and select a region and project.
 - Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
 - Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
 - Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
 - Step 6** On the top menu bar, choose **Database Management**.
 - Step 7** On the displayed **Objects** page, select **Collections**, locate the collection that you want to rename, and click **Rename** in the **Operation** column.
 - Step 8** On the displayed page, set a new name for the collection and click **OK**.
- End



11.4.5 Clearing a Collection

This section describes how to clear data in a collection.

Precautions

Cleared collections cannot be recovered. Exercise caution when performing this operation.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.

Step 7 On the displayed **Objects** tab, choose **Collections**, locate the collection you want to clear, and click **Clear** in the **Operation** column.

Step 8 In the displayed dialog box, click **Yes**.

----End

11.4.6 Dropping a Collection

This section describes how to drop a collection that is no longer needed.


Precautions

Dropped collections cannot be recovered. Exercise caution when performing this operation.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 On the displayed **Objects** tab, choose **Collections**, locate the collection you want to drop and click **Drop** in the **Operation** column.

Step 8 In the displayed dialog box, click **Yes**.

----End


11.4.7 Creating an Index

Indexes can greatly improve query efficiency. If there are no indexes, each file in the collection must be scanned and the records that meet the query conditions must be selected when data is read. If the amount of data is large, querying an entire collection may take dozens of seconds or even minutes.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

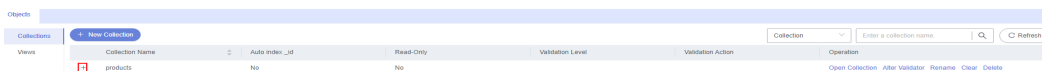
You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

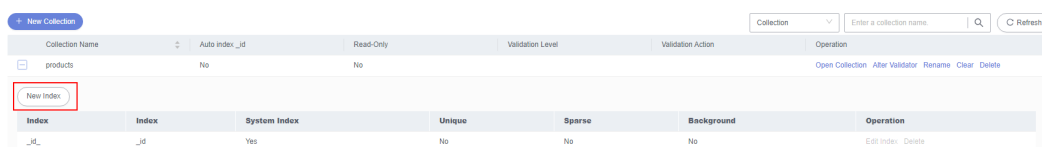
Step 7 On the displayed page, click **+** before the collection name.

Figure 11-19 Expanding the collection list button



Step 8 Click **New Index**.

Figure 11-20 Creating an index



Step 9 On the displayed page, configure basic parameters.

Figure 11-21 Specifying index information

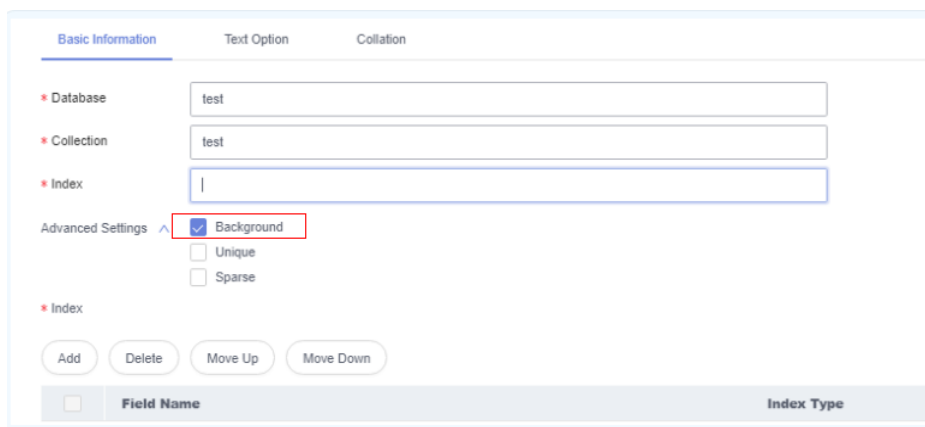


Table 11-3 Parameter description

Parameter	Description
Database	Selected database by default. You can also enter a database name. After the index is created, the system automatically creates a database with the name you entered.
Collection	Selected collection by default. You can also enter a collection name. After the index is created, the system automatically creates a collection with the name you entered.
Index	Index name, which is user-defined.

Parameter	Description
Advanced Settings	<ul style="list-style-type: none"> • Background: indicates the backend mode for creating indexes. Selecting Background is recommended. If this option is not selected, the database will be locked. • Unique: specifies whether the created index is unique. • Sparse: does not enable indexes for field data that does not exist in the document.
Index	Click Add and enter a name and type to add an index.

Step 10 (Optional) on the **Text Option** page, select information such as the index version and default language.

Step 11 (Optional) on the **Collation** page, set the sorting rule.

Step 12 After the configurations are complete, click **Save**.

----End


11.4.8 Editing an Index

This section describes how to alter the basic information, text options, and collation of an index on the DAS console.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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


Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

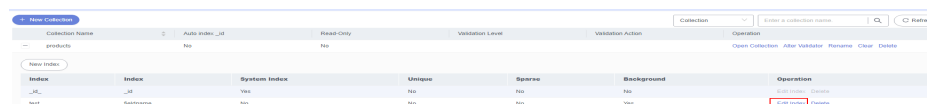
Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Choose **Collections** in the navigation pane. In the index list, locate the index you want to edit and click  before the index name.

Step 8 Locate the index that you want to edit and click **Edit Index** in the **Operation** column.

Figure 11-22 Editing an index



Step 9 Click **Save**.

----End

11.4.9 Deleting an Index

This section describes how to drop an index that is no longer needed.


Precautions

Dropped indexes cannot be recovered. Exercise caution when performing this operation.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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


Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

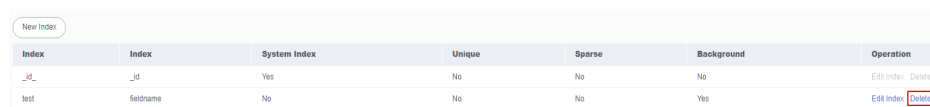
Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 Choose **Collections** in the navigation pane. In the index list, locate the index you want to delete and click  before the index name.

Step 8 Locate the index that you want to delete and click **Delete** in the **Operation** column.

Figure 11-23 Deleting an index



Index	Index	System Index	Unique	Sparse	Background	Operation
id	_id	Yes	No	No	No	Edit Index Delete
test	fieldname	No	No	No	Yes	Edit Index Delete

Step 9 In the displayed dialog box, click **Yes**.

----End

11.5 View Management

11.5.1 Creating a View

A view is a queryable object whose contents are defined by aggregation pipelines on other collections or views. This section describes how to create a view.

Procedure



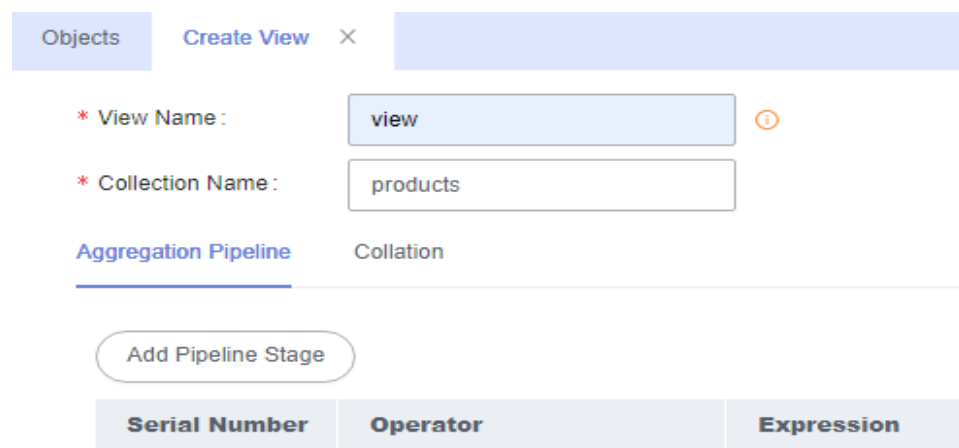
- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab, choose **Views** and click **Create View**.
- Step 8** On the displayed page, enter the view name and collection name.

Figure 11-24 Creating a view



* View Name : ⓘ

* Collection Name :

Aggregation Pipeline Collation

[Add Pipeline Stage](#)

Serial Number	Operator	Expression
---------------	----------	------------

- Step 9** Click **Add Pipeline Stage**. In the displayed dialog box, select an operator and enter an expression.

Figure 11-25 Adding a pipeline stage

The aggregation pipeline you create appears in the list, and you can edit, delete, move up, or move down it.

Figure 11-26 Pipeline management

Serial Number	Operator	Expression	Operation
1	Sgroup	{}	Edit Delete Move Up Move Down

Step 10 On the **Collation** tab, click **Custom Collation** and set collation rules as needed.

Step 11 After setting the view information, click **Save**.

----End


11.5.2 Opening a View

This section describes how to view details of a view on the DAS console.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** page, select **Views**, locate the view that you want to open and click **Open** in the **Operation** column.
- Step 8** On the displayed page, you can perform the following operations:
- Set parameters **Query, Projection, Sort, Limit, and Skip**.
 - On the **JSON** tab page, view filtered documents.
 - DAS allows you to view text files in table and tree mode on the **Tree** and **Table** tab pages.
- End

11.5.3 Editing a View

This section describes how to alter collections, aggregation pipeline information, and validation rules that are associated with a collection.

Usage Notes

Improper alterations on a view will cause instance or service exceptions.

Procedure



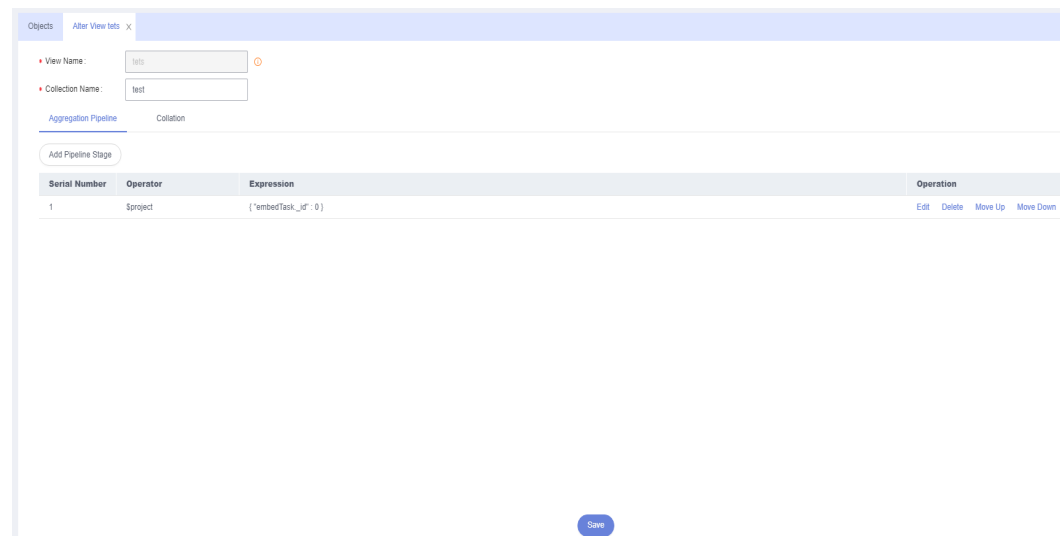
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab, choose **Views**, locate the view you want to edit and click **Alter** in the **Operation** column.
- Step 8** Altering view information

Figure 11-27 Editing a view

Step 9 After editing the view information, click **Save**.

----End

11.5.4 Dropping a View

This section describes how to drop a view that is no longer needed.


Precautions

Dropped views cannot be recovered. Exercise caution when performing this operation.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 On the displayed **Objects** tab, choose **Views**, locate the view you want to drop and click **Drop** in the **Operation** column.

Step 8 In the displayed dialog box, click **Yes**.

----End

11.6 Intelligent O&M


11.6.1 Querying the Number of Connections to an Instance

DAS records client IP addresses and the connections corresponding to each of them.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

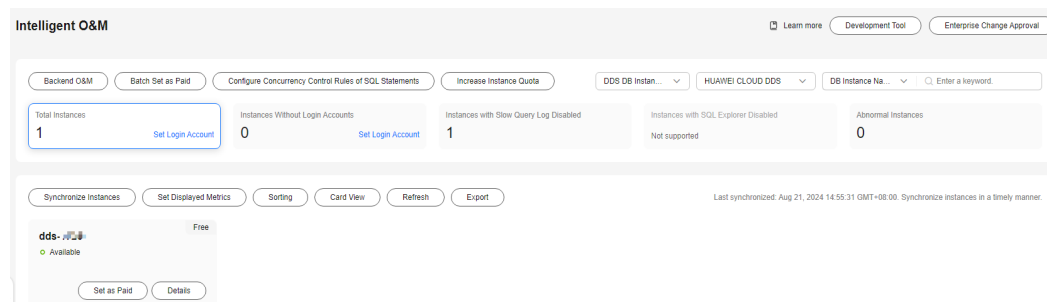
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 11-28 Selecting an instance



Step 6 On the **Connections** page, view connection details of the current instance, including the total connections, internal connections, and external connections.

You can also switch nodes to view the connections of a specific node.

----End

11.6.2 Sessions

You can manage sessions in the following scenarios:

- If the number of sessions of an instance has reached the upper limit and the instance cannot be logged in to any longer, you can view and kill unnecessary sessions using the emergency channel function.
- You can view history logs to learn details of the kill operations that you performed using the emergency channel function.

 **CAUTION**

Killing a session may cause instance or service exceptions.


Usage Notes

- If it can be logged in to through DAS, log in to your instance on the DAS console and enter the commands to kill the sessions in question from there.
- Use this function in urgent conditions. All your kill operations will be logged.
- Only Community Edition 3.4 and 4.0 instances are supported.
- Instances in the creating, frozen or abnormal state are not supported.
- Killing inactive sessions is not allowed.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

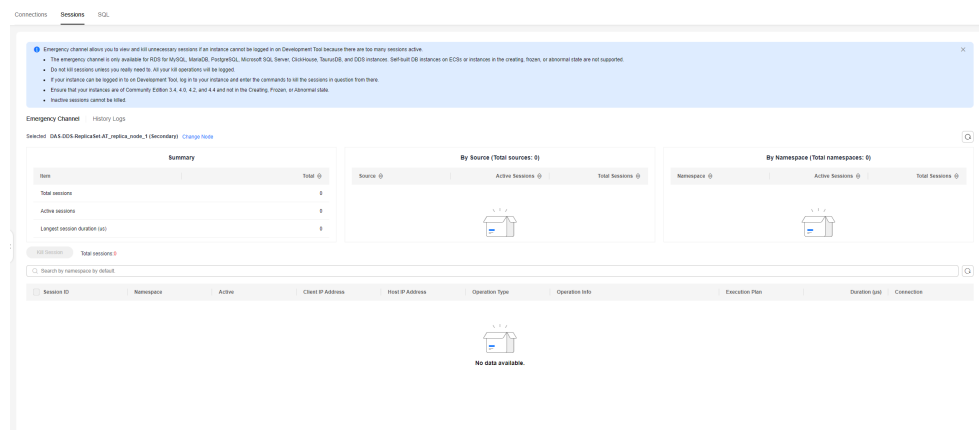
Step 5 Choose **Sessions**.

Step 6 On the displayed **Emergency Channel** page, view session statistics of the current instance node by overview, host, or namespace.

Step 7 In the session list in the lower part of the page, sessions are sorted by running time in descending order by default. Search for sessions by setting a running time threshold or namespace.

Step 8 Select the session that you want to kill and click **Kill Session**.

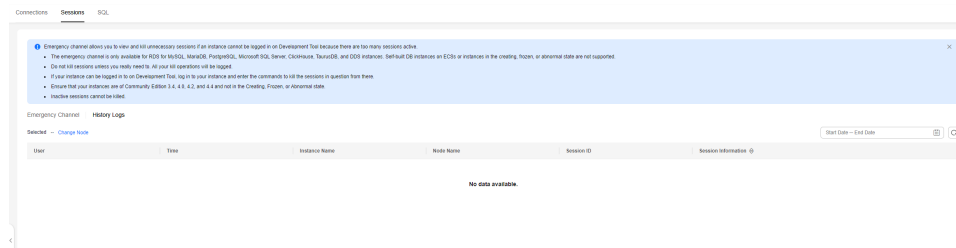
Figure 11-29 Killing a session



Step 9 In the **Kill Session** dialog box, confirm the session information and click **Yes**.

Step 10 Click **History Logs** to view the sessions killed through the emergency channel.

Figure 11-30 Viewing history logs



----End

11.6.3 Slow Query Logs

Slow Query Log displays a chart of SQL statements that are taking too long to execute and allows you to sort slow SQL statements by multiple dimensions, such as by user, client IP address, or SQL template. It helps you quickly identify bottlenecks and improve instance performance.


Usage Notes

- Slow query logs of free instances are retained for only one hour. If you have subscribed to **Intelligent O&M** for paid and free instances, their slow query logs are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.
- You can enable the slow query logs function for a maximum of 10 free instances. There is no such a limit on paid instances.
- For free instances, you can only view slow query logs generated in the latest hour.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

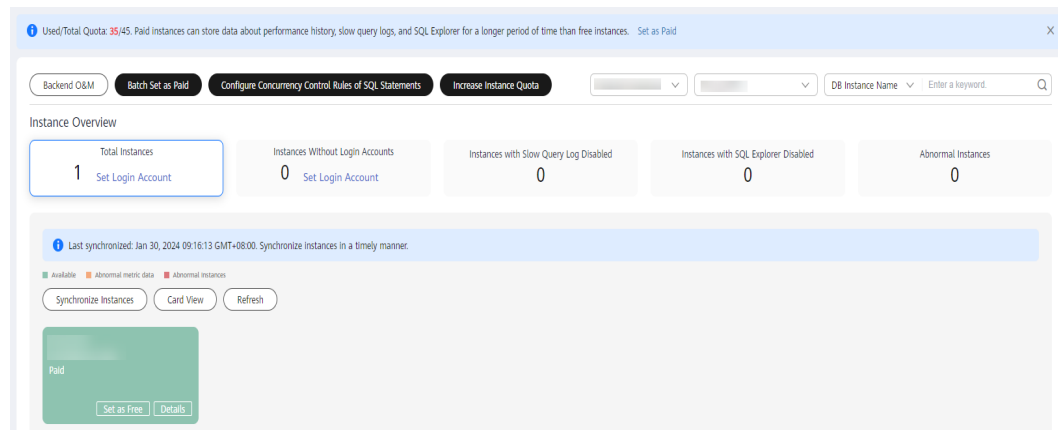
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.


Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 11-31 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL > Slow Query Logs**.

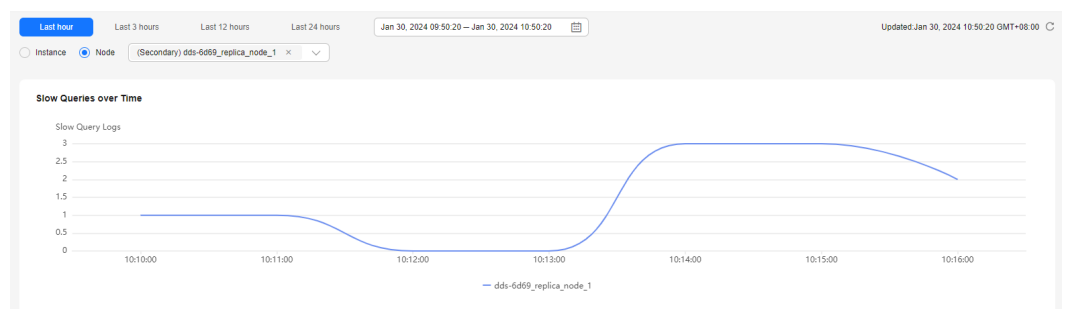
You can click  to enable **Collect Slow Query Logs**.

You can also click **Log Settings** in the upper right corner of the page to enable **Collect Slow Query Logs**.

On the **SQL Query Logs** tab page, you can select a time range (last hour, last 3 hours, last 12 hours, or a user-defined time range which must be within three days) to view slow queries in the time range. You can view slow query logs over time, as well as slow query log statistics and details.

- The **Slow Queries over Time** chart displays slow query logs in the specified time period.

Figure 11-32 Slow queries over time



- **Statistics** shows slow query logs by node, SQL statement type, database, data table, user, and client.

Figure 11-33 Slow query log statistics

Statistics Details

Top Slow Query Logs

Top Slow Query Logs 10

Execution C...	SQL Statement	Type	Database	Table	Client IP Ad...	User	Execution D...	Lock Wait TL...	Scanned Do...	Returned Do...	Scanned In...
Jan 30, 2024 10...	["ns""test.c...	insert	test1	col9	127.0.0.9	username9	90000.000	9000.000	9	9	9
Jan 30, 2024 10...	["ns""test.c...	insert	test2	col9	127.0.0.9	username9	90000.000	9000.000	10	10	10
Jan 30, 2024 10...	["ns""test.c...	insert	test2	col8	127.0.0.8	username8	80000.000	8000.000	8	8	8
Jan 30, 2024 10...	["ns""test.c...	insert	test1	col7	127.0.0.7	username7	70000.000	7000.000	7	7	7
Jan 30, 2024 10...	["ns""test.c...	set	test2	col6	127.0.0.6	username6	60000.000	6000.000	6	6	6
Jan 30, 2024 10...	["ns""test.c...	set	test1	col5	127.0.0.5	username5	50000.000	5000.000	5	5	5
Jan 30, 2024 10...	["ns""test.c...	use	test2	col4	127.0.0.4	username4	40000.000	4000.000	4	4	4
Jan 30, 2024 10...	["ns""test.c...	use	test1	col3	127.0.0.3	username3	30000.000	3000.000	3	3	3
Jan 30, 2024 10...	["ns""test.c...	use	test2	col2	127.0.0.2	username2	20000.000	2000.000	2	2	2
Jan 30, 2024 10...	["ns""test.c...	insert	test1	col1	127.0.0.1	username1	10000.000	1000.000	1	1	1

By Node

Node Name	Executions	Avg. Executi...	Max. Executi...	Avg. Lock W...	Max. Lock W...	Avg. Docum...	Max. Docum...	Avg. Docum...	Max. Docum...	Avg. Indexe...	Max. Index...
All	30	420333.333	1100000.000	42033.333	1100000.000	12.000	61	22.333	101	22.333	101
dds-6d59_replic...	10	54000.000	90000.000	5400.000	9000.000	5.500	10	5.500	10	5.500	10

10 Total Records: 2

By Type

Type	Executions	Avg. Executi...	Max. Executi...	Avg. Lock W...	Max. Lock W...	Avg. Docum...	Max. Docum...	Avg. Docum...	Max. Docum...	Avg. Indexe...	Max. Index...
insert	5	68000.000	90000.000	6800.000	9000.000	7.000	10	7.000	10	7.000	10
use	3	30000.000	40000.000	3000.000	4000.000	3.000	4	3.000	4	3.000	4
set	2	55000.000	60000.000	5500.000	6000.000	5.500	6	5.500	6	5.500	6

10 Total Records: 3

By Database

Database	Executions	Avg. Executi...	Max. Executi...	Avg. Lock W...	Max. Lock W...	Avg. Docum...	Max. Docum...	Avg. Docum...	Max. Docum...	Avg. Indexe...	Max. Index...
test1	5	50000.000	90000.000	5000.000	9000.000	5.000	9	5.000	9	5.000	9
test2	5	58000.000	90000.000	5800.000	9000.000	6.000	10	6.000	10	6.000	10

- Slow query log details include the execution completion time, SQL statement, SQL statement type, database, database table, client IP address, user, execution duration, lock wait time, scanned documents, returned documents, and scanned indexes.

Figure 11-34 Slow query log details

Statistics Details

Default search by SQL statement

Execution C...	SQL Statement	Type	Database	Table	Client IP Ad...	User	Execution D...	Lock Wait TL...	Scanned Do...	Returned Do...	Scanned Ind...
Jan 30, 2024 10...	["ns""test.co...	insert	test2	col9	127.0.0.9	username9	90000.000	9000.000	10	10	10
Jan 30, 2024 10...	["ns""test.co...	insert	test1	col9	127.0.0.9	username9	90000.000	9000.000	9	9	9
Jan 30, 2024 10...	["ns""test.co...	set	test2	col6	127.0.0.6	username6	60000.000	6000.000	6	6	6
Jan 30, 2024 10...	["ns""test.co...	insert	test1	col7	127.0.0.7	username7	70000.000	7000.000	7	7	7
Jan 30, 2024 10...	["ns""test.co...	insert	test2	col8	127.0.0.8	username8	80000.000	8000.000	8	8	8
Jan 30, 2024 10...	["ns""test.co...	use	test2	col4	127.0.0.4	username4	40000.000	4000.000	4	4	4
Jan 30, 2024 10...	["ns""test.co...	set	test1	col5	127.0.0.5	username5	50000.000	5000.000	5	5	5
Jan 30, 2024 10...	["ns""test.co...	use	test1	col3	127.0.0.3	username3	30000.000	3000.000	3	3	3
Jan 30, 2024 10...	["ns""test.co...	use	test2	col2	127.0.0.2	username2	20000.000	2000.000	2	2	2
Jan 30, 2024 10...	["ns""test.co...	insert	test1	col1	127.0.0.1	username1	10000.000	1000.000	1	1	1

10 Total Records: 10

Above the chart, you can switch to another instance or node to view slow query logs by instance or by node.

----End

12 DDM

12.1 Account Management

12.1.1 User Management

Multiple users with different permissions can be created to access a DB instance or database, but the permissions of these users cannot exceed the operation permissions of the account.

Creating a User



- Step 1** [Log in to the Huawei Cloud console.](#)
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > User Management**.

Figure 12-1 User list



Username	Status	Schema Name	Basic Permission	Extended Permissic	Read Policy Type	Description	Operation
	Running	db_2tc3	2	1			Edit Delete
das_test	Running	db_2tc3	8	3			Edit Delete

- Step 7** Click **Create User**. On the displayed page, enter the user information, such as basic information, basic permissions, extended permissions, and schema (optional), and select the read policy type.

Figure 12-2 Creating a user

Create User [< Back to User Management List](#)

Basic Information

* Username

* Password

* Confirm Password

Basic Permission

<input type="checkbox"/>	Permission
<input type="checkbox"/>	CREATE
<input type="checkbox"/>	DROP
<input type="checkbox"/>	ALTER
<input type="checkbox"/>	INDEX
<input type="checkbox"/>	INSERT
<input type="checkbox"/>	DELETE
<input type="checkbox"/>	UPDATE
<input type="checkbox"/>	SELECT

Extended Permission

<input type="checkbox"/>	Permission
<input type="checkbox"/>	Full Table Query

Table 12-1 Basic permissions

Permission	Description
CREATE	Permission to create databases for a specified object.
DROP	Permission to delete databases for a specified object.

Permission	Description
ALTER	Permission to modify databases for a specified object.
INDEX	Permission to query indexes of a specified object.
INSERT	Permission to insert data into a specified object.
DELETE	Permission to delete data from a specified object.
UPDATE	Permission to update data of a specified object.
SELECT	Permission to query data of a specified object.


Step 8 Ensure that the settings are correct and click **Save**.

----End

Editing a User

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Account Management > User Management**.

Step 7 In the user list, locate the user whose information you want to edit and click **Edit** in the **Operation** column.


Step 8 On the displayed page, edit basic information, basic permissions and extended permissions, and click **Save**.

----End

Deleting a User

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Account Management > User Management**.
- Step 7** In the user list, locate the user that you want to delete and click **Delete** in the **Operation** column.
- Step 8** In the displayed dialog box, click **Yes**.
- End

12.2 Database Management

Database operations are currently not supported. To create or delete a schema, see [Schema Management](#)

12.3 SQL Operations

12.3.1 SQL Window

DAS allows you to run various SQL statements in graphical SQL windows, helping you easily manage databases.

Introduction to SQL Window

Figure 12-3 SQL window

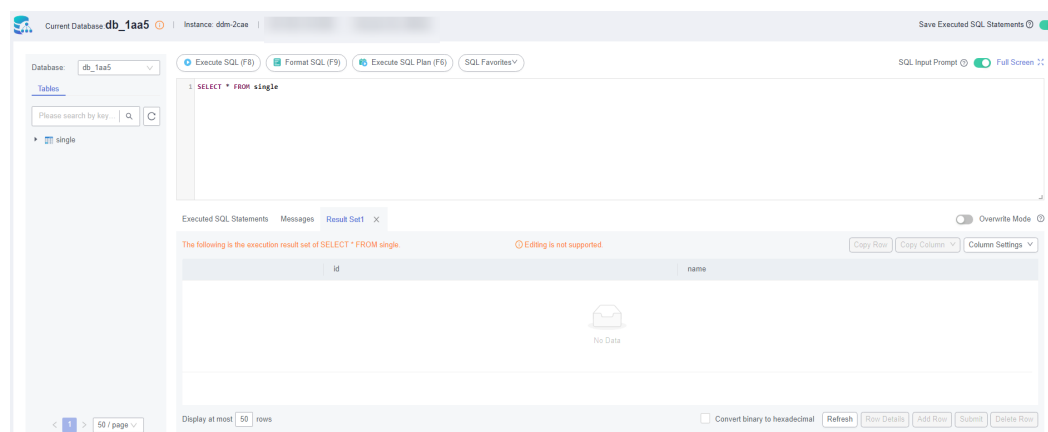


Table 12-2 Function description


Function	Description
Execute SQL	Executes SQL statements.

Function	Description
Format SQL	Improves readability of SQL statements. Formatting SQL statements enables statements to be displayed in line break mode, but does not change their logic and semantics. SQL formatting takes effect for all the SQL statements in the SQL window. You cannot format only one selected statement.
Executing SQL Plan	Reports execution of SQL statements to make troubleshooting easy and optimize SQL processing performance.
SQL Favorites	Allows you to add, view, and manage frequently-used SQL statements.
Save Executed SQL Statements	After this function is enabled, the system saves the recently executed SQL statements to the server.
SQL Input Prompt	Helps you quickly enter a specific database, table, or field name when you enter a SQL statement in the SQL window.
Full Screen	Shows SQL statements on a full screen.
SQL History	Shows the SQL execution details.
Messages	Shows the information returned after a SQL statement is executed.
Result Set	Shows SQL execution results. Allows you to view details about a single row, copy a row, copy a column, set a column, and more.
Overwrite/Append Mode	<ul style="list-style-type: none">● Append Mode: Each time a SQL statement is executed, the new result set is appended to the previous one.● Overwrite Mode: Each time a SQL statement is executed, the new result set overwrites the previous one.

Opening the SQL Window

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

----End


12.3.2 Executing SQL Statements

This section describes how to execute various SQL statements.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **SQL Operations > SQL Query**.

Step 7 Select a database from the navigation tree on the left.

Step 8 Enter a SQL statement in the SQL window and click **Execute SQL**.

- Enabling **SQL Input Prompt** is recommended. It helps you select the required database, table, or field name when you enter a SQL statement in the SQL window.
- You can execute multiple SQL statements at a time. Separate them using semicolons (;). You can click **Full Screen** to view logics in SQL statements clearly.
 - To execute some of the SQL statements, select the statements before executing them.
 - To execute all SQL statements, do not select any SQL statements or select all SQL statements.

Step 9 View execution details of the current SQL statement and previously executed SQL statements in the lower part of the page.

Step 10 Click the **Messages** tab, view SQL execution details, including affected rows, progress, and time required.

Figure 12-4 Viewing messages

Step 11 On the **Result Set** tab, view SQL execution results. You can perform the following operations on the result sets:

- **Copy Row/Copy Column:** Copy a row or column for reuse.
- **Column Settings:** Customize columns to be displayed when there are a large number of columns in the query result.
- **Refresh:** Refresh changed data.
- **Row Details:** View the column field name, value, and type of the selected row.
- **Export:** The SQL, CSV, and Excel files are supported. No more than 7.84 MB of data with 10,000 records can be exported. The actual size of an Excel file may exceed 7.84 MB due to its format.

----End


12.3.3 Executing SQL Plan

This section describes how to analyze the execution efficiency of a SQL statement.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

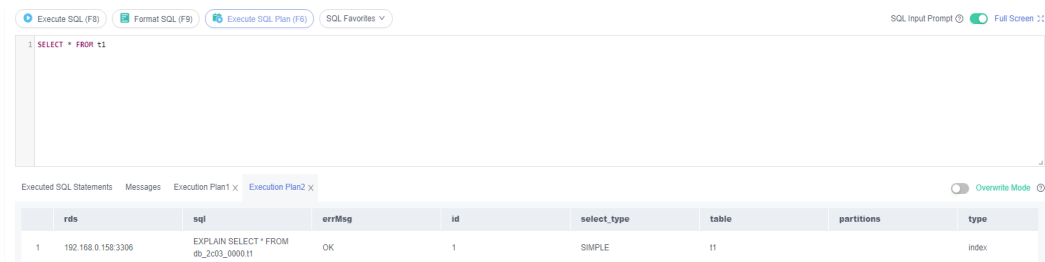
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- Step 7** Select a database from the navigation tree on the left.
- Step 8** Enter a SQL statement in the SQL window and click **Execute SQL Plan**.

Figure 12-5 Executing SQL plan



- On the **Executed SQL Statements** tab page, view SQL execution history.
- On the **Messages** tab page, view the execution information, including SQL splitting, execution status, and elapsed time.
- On the **Execution Plan** tab page, view SQL execution details. Execution plan details of SQL statements are displayed on different tabs.

----End

12.3.4 SQL Favorites

This section describes how to add frequently-used SQL statements and view and manage them.

Procedure



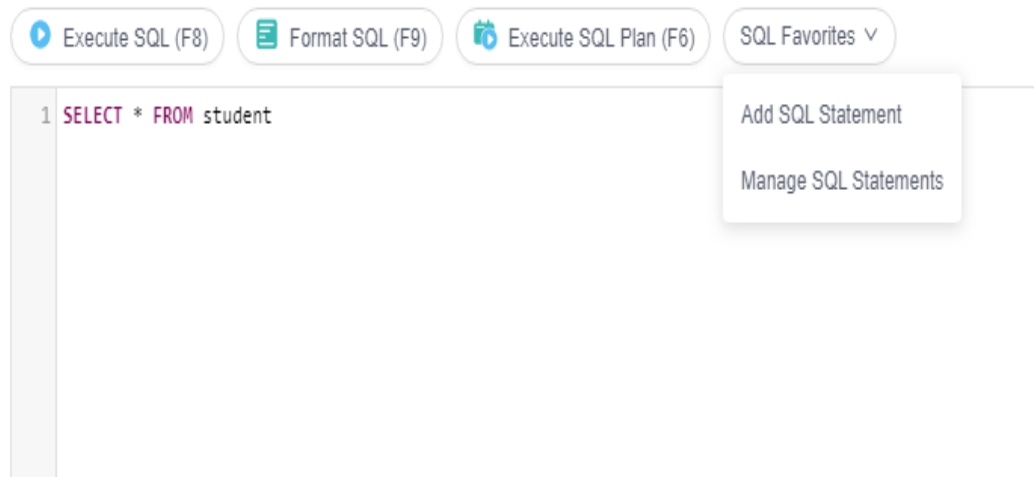
- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL Query**.
- Step 7** In the SQL window, click **SQL Favorites**.

Figure 12-6 SQL favorites



- **Add SQL Statement:** allows you to add frequently-used SQL statements. Specifically, specify a title, select an application scope, enter SQL statements, and then click **Save**.

Figure 12-7 Adding a SQL statement

Add SQL Statement

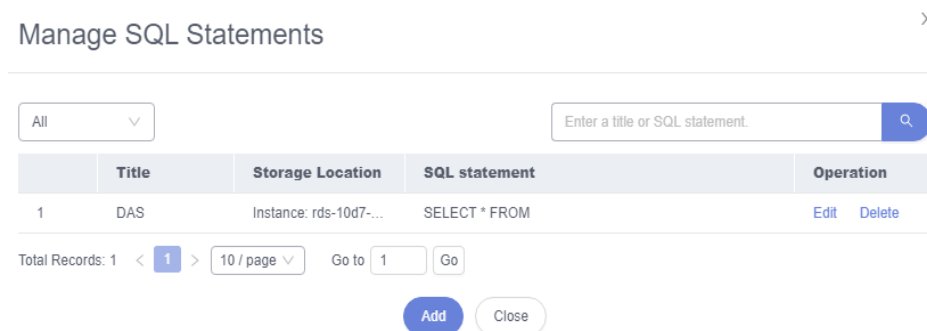
* Title:

Application Scope: All DB instances Current DB instance Current database

* SQL statement:

```
1 SELECT * FROM student
```

- **Insert SQL Statement:** allows you to view the SQL statements you have added. If there are no SQL statements stored in your account, this option will not be displayed.
- **Manage SQL Statements:** allows you to manage frequently used SQL statements, including adding, editing, and deleting statements.

Figure 12-8 Managing SQL statements

----End

12.3.5 SQL History

After you toggle on **Save Executed SQL Statements**, DAS will save the SQL statements you executed in the SQL window for future view. You can also execute the SQL statements again with no need to enter them again in the SQL window.



Prerequisites

- You have enabled **Save Executed SQL Statements**.
- After you enable **Save Executed SQL Statements**, executed SQL statements will be recorded in the DAS management host.

Constraints on Usage

SQL statement execution records can be stored for up to one year.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **SQL Operations > SQL History**.
- Step 7** On the displayed page, search for execution information about the target SQL statement by time range, database name, or keyword.
 - To access the **Database Management** page, click a database name.
 - To copy a SQL statement, click it in the **SQL Statement** column.

- To execute a SQL statement, click **Open in SQL window** in the **Operation** column.

----End

12.4 Table Management


12.4.1 Creating a Table

A data table consists of basic information, fields, and indexes. As the supplement to table information, indexes are optional and can be configured based on service requirements.

Procedure

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 On the displayed **Objects** page, select **Tables**. In the upper left corner of the page, click **Create Table**.

Step 8 On the displayed page, specify required parameters.

Figure 12-9 Basic information

1 Basic Information

* Table Name

Storage Engine

Character Set

Collation

Comment

Advanced Settings ▾

Step 9 Click **Next**.

Step 10 On the **Column** page, click **Add** and set **Column Name**, **Type**, **Nullable**, **Primary Key**, and **Extended Information** as needed.

- If you do not need to add indexes, click **Create**.
- If you need to add indexes, click **Next** until all your desired parameters are specified. After the setting is complete, click **Create**.

Step 11 In the **SQL Preview** dialog box, click **Execute**.

----End

12.4.2 Opening a Table

This section describes how to open a table on the DAS console and view data in the table.

Precautions

Currently, tables in a database cannot be edited.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).



- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab, choose **Tables** on the left. In the table list, locate the table you want to open, and click **Open** in the **Operation** column.
- Step 8** On the table details page, view the table information.
You can also perform the operations listed in [Table 12-3](#).

Table 12-3 UI operations


Name	Description
Where Condition	Filters records.
Copy Row	Copies data of the selected row. Specifically, double-click the target row and then click Copy Row .
Copy Column	Allows you to copy all data in a column by selecting this column from the Copy Column drop-down list.
Column Settings	Allows you to set the columns you want to display.
Convert binary to hexadecimal	Prevents binary data in columns from being displayed as garbled characters. If there is binary data in columns, you must select this option.
Refresh	Allows you to update table data manually.
Row Details	Shows details of a specified row.


----End

12.4.3 Viewing Details of a Table

This section describes how to view table information and the SQL statement for creating this table.

Procedure

- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.

- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab, choose **Tables** on the left. In the table list, locate the table whose details you want to view and click **View** in the **Operation** column.
- Step 8** In the displayed dialog box, view basic information of the table and the SQL statement for creating the database.

----End

12.4.4 Altering a Table

This section describes how to alter a table on the DAS console.

Usage Notes

Improper alterations on a table will cause instance or service exceptions.

Procedure



- Step 1** [Log in to the Huawei Cloud console](#).
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.
- Step 4** In the navigation pane on the left, choose **Development Tool**.
You can also click **Go to Development Tool** on the overview page.
- Step 5** Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.
- Step 6** On the top menu bar, choose **Database Management**.
- Step 7** On the displayed **Objects** tab, choose **Tables** on the left.
- Step 8** In the right pane, locate the table you want to alter and click **Alter** in the **Operation** column.

Figure 12-10 Altering a table

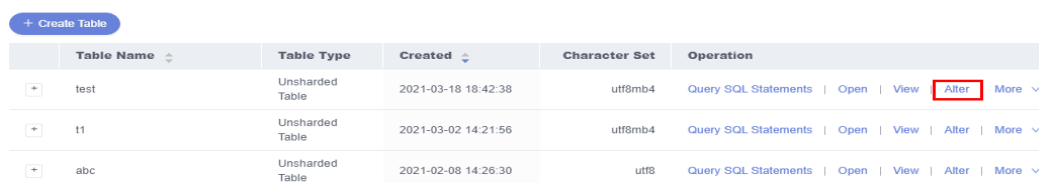



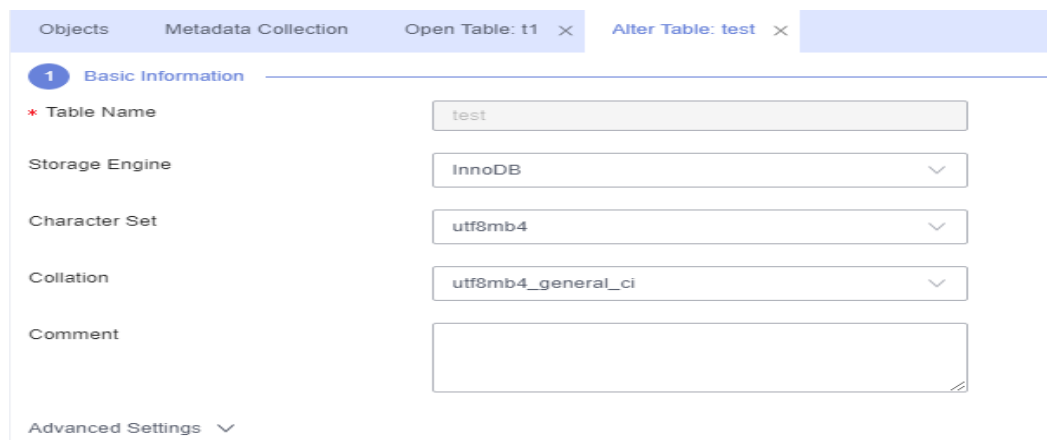


	Table Name	Table Type	Created	Character Set	Operation
	test	Unsharded Table	2021-03-18 18:42:38	utf8mb4	Query SQL Statements Open View Alter More
	t1	Unsharded Table	2021-03-02 14:21:56	utf8mb4	Query SQL Statements Open View Alter More
	abc	Unsharded Table	2021-02-08 14:26:30	utf8	Query SQL Statements Open View Alter More

Step 9 On the displayed tab, modify the parameters as required and click **Save**.

Figure 12-11 Altering table settings



The screenshot shows a web interface for altering table settings. At the top, there are tabs: 'Objects', 'Metadata Collection', 'Open Table: t1', and 'Alter Table: test'. The 'Alter Table: test' tab is active. Below the tabs, there is a section titled '1 Basic Information'. It contains several fields: 'Table Name' (with a red asterisk) containing 'test', 'Storage Engine' (a dropdown menu showing 'InnoDB'), 'Character Set' (a dropdown menu showing 'utf8mb4'), 'Collation' (a dropdown menu showing 'utf8mb4_general_ci'), and 'Comment' (a text area). At the bottom left, there is a link for 'Advanced Settings' with a downward arrow.

Step 10 After the alteration is complete, click **Alter**.

Step 11 In the **SQL Preview** dialog box, click **Execute**.

----End

12.4.5 Clearing a Table

This section describes how to clear data in a table.


Precautions

Cleared tables cannot be recovered. Exercise caution when performing this operation.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 On the displayed **Objects** tab, choose **Tables** on the left.

Step 8 In the right pane, locate the table you want to clear and choose **More > Clear** in the **Operation** column.

Step 9 In the displayed dialog box, click **Yes**.

----End

12.4.6 Dropping a Table

This section describes how to drop a table that is no longer needed.


Precautions

Dropped tables cannot be recovered. Exercise caution when performing this operation.

Procedure

Step 1 [Log in to the Huawei Cloud console](#).

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane on the left, choose **Development Tool**.

You can also click **Go to Development Tool** on the overview page.

Step 5 Locate the DB instance that you want to log in to and click **Log In** in the **Operation** column.

Step 6 On the top menu bar, choose **Database Management**.

Step 7 On the displayed **Objects** tab, choose **Tables** on the left.

Step 8 In the right pane, locate the table you want to drop and choose **More > Drop** in the **Operation** column.

Step 9 In the displayed dialog box, click **Yes**.

----End

12.5 Intelligent O&M

12.5.1 Setting an Instance as Paid

Intelligent O&M is available for paid and free instances. Paid instances can enjoy more value-added functions.

For details about instance billing policies, see [Intelligent O&M Billing](#).

If you want to set an instance as paid, go to [Setting an Instance as Paid](#).


If you want to set more than one instance as paid, go to [Setting Instances as Paid](#).

If you want to set your instances as free instances, see [Setting a Paid Instance as Free](#).

Setting an Instance as Paid

Step 1 [Log in to the Huawei Cloud console.](#)

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

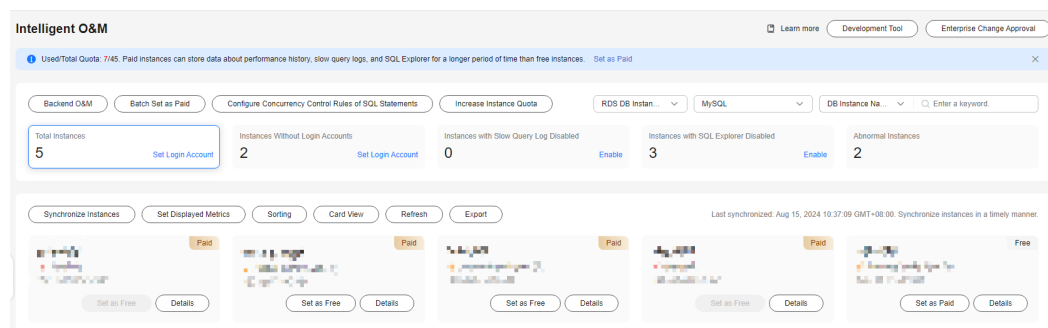
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 12-12 Searching for instances



Step 6 Select the instance that you want to set as paid and click **Set as Paid**.

Step 7 Carefully read the information displayed in the dialog box and click **OK**.


Step 8 On the **Instance List** page, check whether the instance status changes to **Paid**.

----End

Setting Instances as Paid

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 On the displayed page, click **Batch Set as Paid** or **Set as Paid**.

Step 6 Carefully read the information displayed in the dialog box, select the instances that you want to set as paid, and click **OK**.


Step 7 On the **Instance List** page, check whether the instance status changes to **Paid**.

----End

Setting a Paid Instance as Free

Step 1 Log in to the Huawei Cloud console.

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

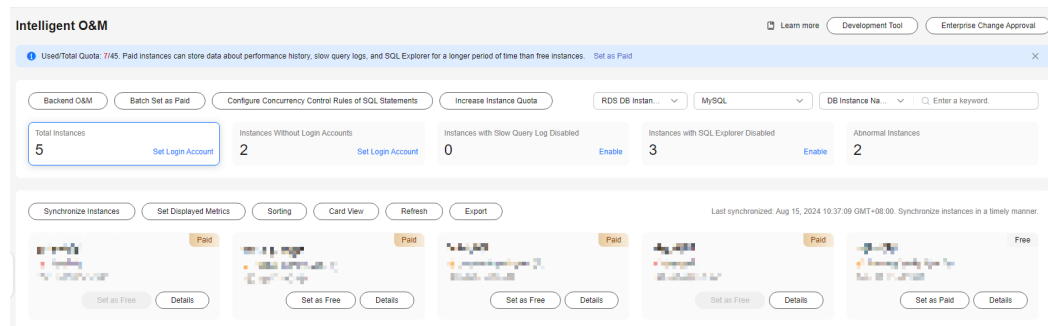
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 12-13 Searching for instances



Step 6 Locate the instance that you want to set as free and click **Set as Free** on the **Instance Overview** page.

Step 7 Carefully read the information displayed in the dialog box and click **OK**.

- If an instance is set as paid, you have to wait 5 minutes before it can be changed back to free.
- On the **Instance List** page, check whether the instance status changes to **Free**.

-----End

12.5.2 SQL

12.5.2.1 Slow Query Logs

This section describes how to analyze slow query logs in a specified period. Slow Query Log displays a chart of SQL statements that are taking too long to execute and allows you to sort slow SQL statements by multiple dimensions, such as by user, host, or SQL template. It helps you quickly identify bottlenecks and improve instance performance.

Usage Notes


- To use the slow query log function, you need to toggle on **Collect Slow Query Logs**. Then DAS will store slow query logs for analysis.

- Slow query logs of free instances are retained for only one hour while those of paid instances are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.
- You can enable the slow query logs function for a maximum of 10 free instances. There is no such a limit on paid instances.
- For free instances, you can only view slow query logs generated in the latest hour.

Viewing Slow Query Logs

Step 1 Log in to the Huawei Cloud console.

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

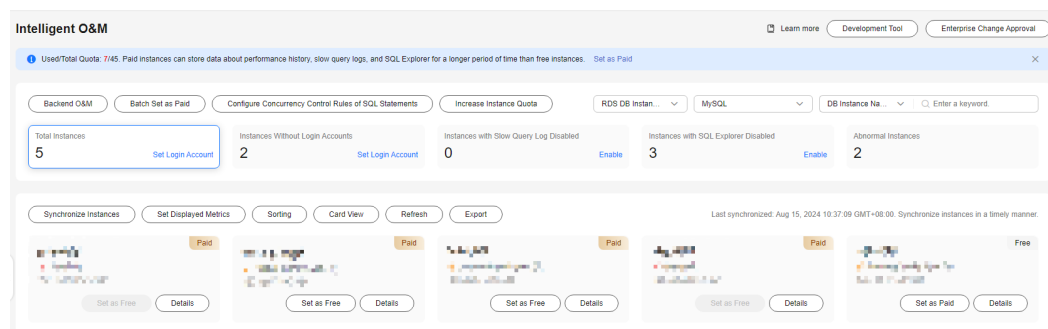
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M** > **Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 12-14 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL** > **Slow Query Logs**.

Step 8 Select a time range and view trends, statistics, and details of the slow query logs generated within the time range.

- Log trends

In the trends graph, you can hover your mouse at any point in time to view slow query logs.

- Log details

View slow query log details in the lower part of the **Slow Query Logs** area. The details include the SQL statement, execution time, database name, client, user, execution duration, lock wait duration, and scanned and returned rows.

Figure 12-15 Viewing slow query log details

NO.	Execution St...	SQL Statement	Database	Client IP Address	User	Execution D...	Lock Wait Ti...	Rows Scanned	Rows Retu...	Operation
1	Aug 16, 2024 14...	select sleep	czh_test	192.168.1.100	root[root]	2,000.272	0	0	1	Concurrency Control Diagnose
2	Aug 16, 2024 14...	select sleep	czh_test	192.168.1.100	root[root]	2,000.264	0	0	1	Concurrency Control Diagnose
3	Aug 16, 2024 14...	select sleep	czh_test	192.168.1.100	root[root]	2,000.287	0	0	1	Concurrency Control Diagnose

Click **Export** to export slow query log details to a specific OBS bucket. After the details are exported, you can click **Export History** to view export records. You can also download the details to your local PC.

Figure 12-16 Exporting slow query log details



NOTE

This function is available to only paid instances.

- Slow query log statistics

Figure 12-17 Slow query log statistics

NO.	ID	SQL Templ...	Database	Executi...	Avg. Ex...	Max. E...	Avg. Lo...	Max. L...	Avg. R...	Max. R...	Avg. R...	Max. R...	Operation
1	10788057...	SELE...	czh_test	662	2,000	2,000	0	0	0	0	0	1	View Sample Diagnose

Click **Sample** in the **Operation** column to view the sample of the SQL statement template.

On the **Statistics** page, click **Export** to export slow query logs to a specific OBS bucket. Then you can click **Export History** to view export records. You can also download the exported slow query logs to your local PC.

NOTE

This function is available to only paid instances.

----End

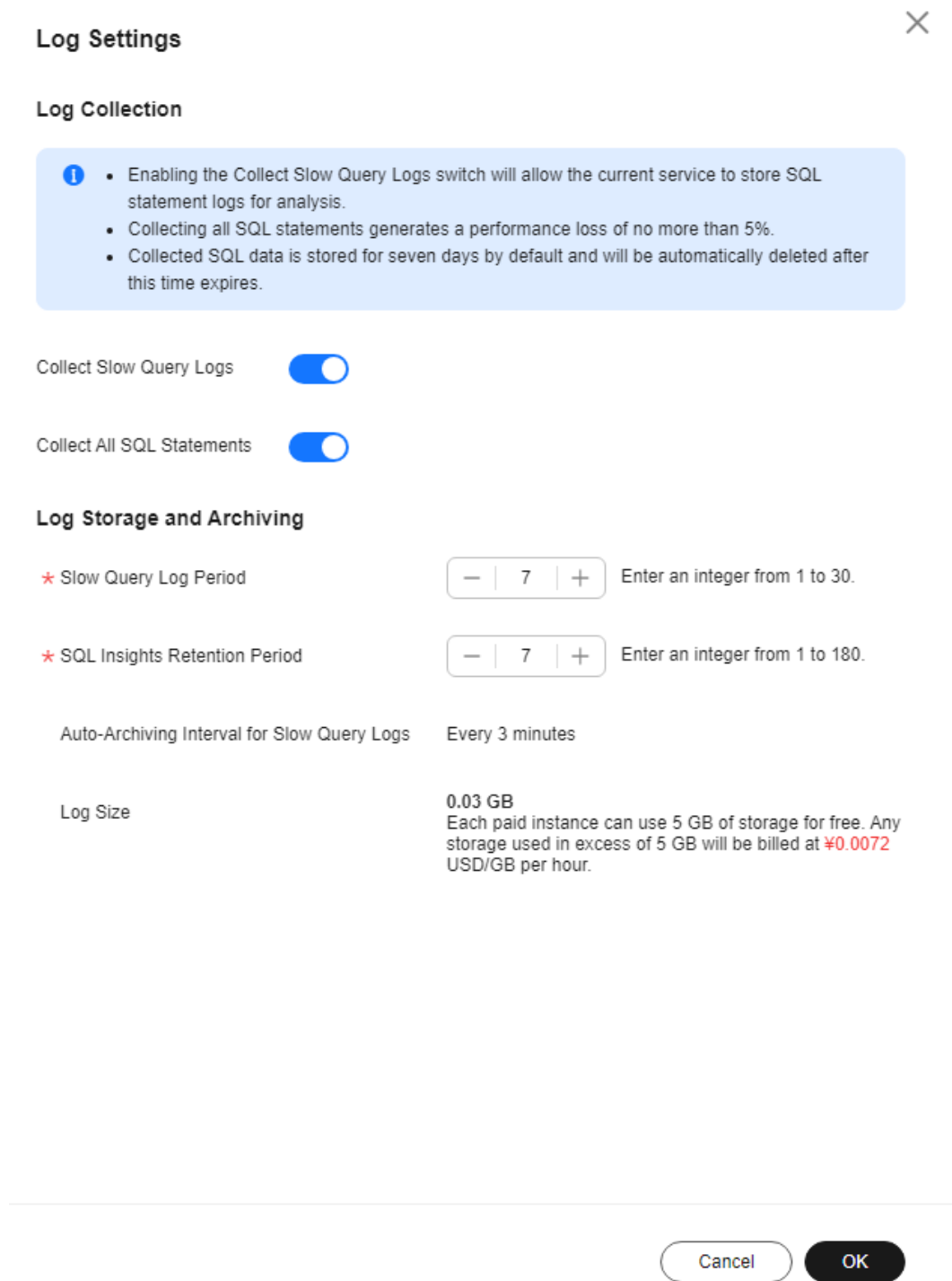
Slow Query Log Storage

After **Collect Slow Query Logs** is enabled, SQL text content will be stored in OBS for analysis.

Slow query logs of free instances are retained for only one hour while those of paid instances are retained for seven days by default and can be retained for up to 30 days. After the retention period expires, slow query logs are deleted.

For paid instances, you can click **Log Settings** to set the storage duration on the **Slow Query Logs** tab page.

Figure 12-18 Setting storage duration for slow query logs



Each paid instance can use 5 GB of storage for slow query logs for free. Any storage used in excess of 5 GB will be billed on a pay-per-use basis.

Deleting Slow Query Logs

On the **Slow Query Logs** tab page, you can click **Delete All** or **Delete** to delete all slow query logs or some slow query logs generated in a specific period.

NOTE

Deleted slow query logs cannot be recovered. Exercise caution when performing this operation.

12.5.2.2 SQL Explorer

After **Collect All SQL Statements** is enabled, you can gain a comprehensive insight into SQL statements on the **SQL Explorer** page. Top SQL helps you locate exceptions.

SQL Explorer can record all SQL statements executed on your instance and enables you to analyze and search for the tables that are accessed and updated the most frequently and the SQL statements that have the longest lock wait.


Usage Notes

- After **Collect All SQL Statements** is disabled, new SQL statements will not be collected and the collected SQL statements will be deleted.
- Logs of all SQL statements executed on free instances can be retained for only one hour while those for paid instances can be retained for seven days by default and for up to 30 days as a maximum. After the retention period expires, the logs are deleted automatically.

Execution Duration Distribution of Top SQL Templates

Step 1 [Log in to the Huawei Cloud console.](#)

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

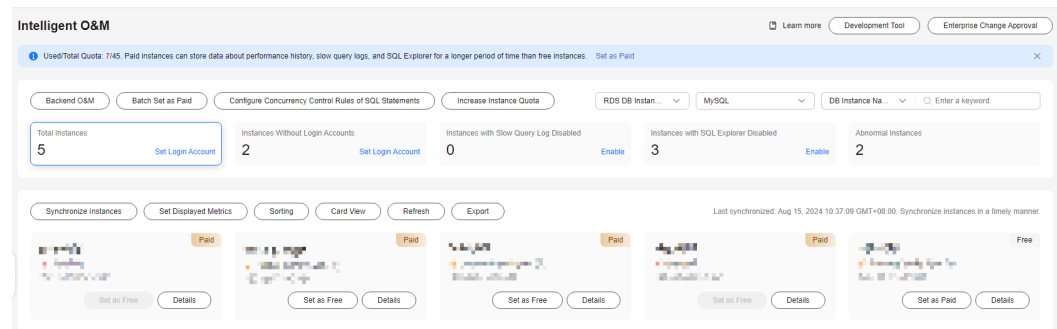
Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 In the navigation pane, choose **Intelligent O&M > Instance List**.

Alternatively, on the **Overview** page, click **Go to Intelligent O&M**.

Step 5 In the upper right corner of the **Instance List** page, search for instances by engine type, instance name, or instance IP.

Figure 12-19 Searching for instances



Step 6 Locate the target instance and click **Details**.

Step 7 Choose **SQL > SQL Explorer**.

Step 8 Toggle on **Collect All SQL Statements** to obtain information about all SQL statements executed on the current instance.

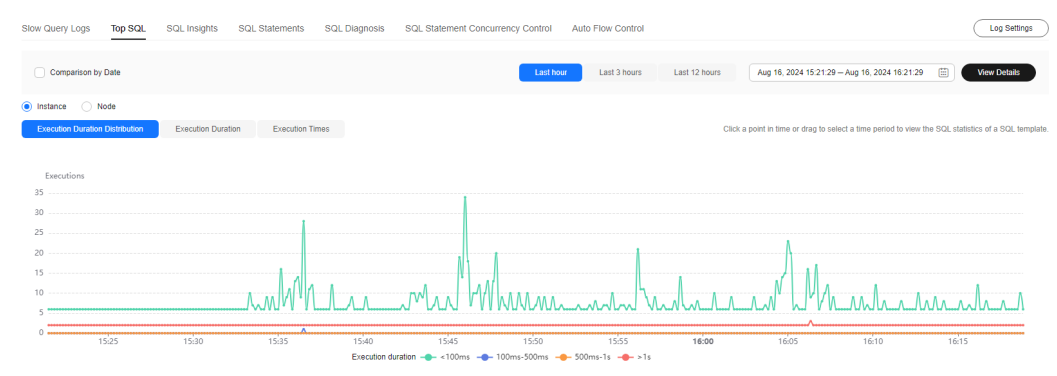
NOTE

Collect All SQL Statements takes effect once it is enabled.

Step 9 On the **Top SQL** tab page, view execution duration of top SQL statements.

You can select **Last hour**, **Last 3 hours**, or **Last 6 hours** to view execution durations of top SQL statements. You can also set a time range that spans no more than one day.

Figure 12-20 Top SQL



The Execution Duration Distribution graph shows how many times SQL statements with different elapsed time lengths are executed over a specified time range. DAS collects SQL statistics of four elapsed time lengths.

- < 100 ms: number of SQL statement executions whose elapsed time is less than 100 ms
- 100 ms–500 ms: number of SQL statement executions whose elapsed time ranges from 100 ms to 500 ms
- 500 ms–1s: number of SQL statement executions whose elapsed time ranges from 500 ms to 1s
- > 1s: number of SQL statement executions whose elapsed time is longer than 1s

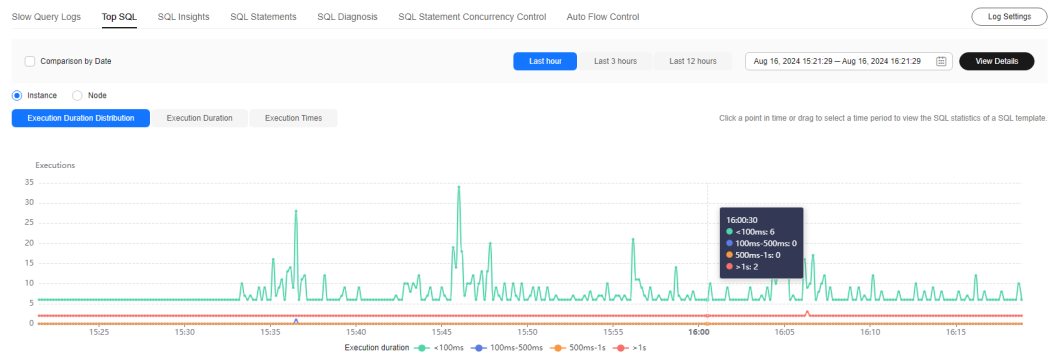
SQL statistics in the four elapsed time lengths are collected over the time range you specified.

- If you select **Last hour**, SQL statement executions are calculated every 10 seconds.
- If you select **Last 6 hours**, SQL statement executions are calculated every minute.
- If you select a time range longer than 6 hours, SQL statement executions are calculated every 5 minutes.

Step 10 Use either of the following methods to view execution duration details, such as average execution duration, total duration, average lock wait duration, and average scanned rows.

- Hover your mouse at any point in time on the graph to view top SQL statements at that time.

Figure 12-21 Viewing top SQL statements at a specific point in time



- Specify a time range using your mouse on the graph, and you will see top SQL statements during that time range.

Figure 12-22 Viewing top SQL statements in a specified time range





- Click **Export** to export details about all top SQL templates in the list. This function is available only to paid instances.
- In the SQL template list, locate a SQL template and click **Details** to view the total execution times, average rows scanned, average execution duration, and the like.

----End

SQL Audit

Step 1 [Log in to the Huawei Cloud console.](#)

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

Step 3 Click  in the upper left corner, and under **Databases**, click **Data Admin Service**.

Step 4 On the **Overview** page, click **Go to Intelligent O&M**.

Step 5 Locate the target instance and click **Details**.

Step 6 Choose **SQL > SQL Explorer**.

Step 7 Click the **SQL Audit** tab.

Step 8 On the **SQL Audit** tab page, view SQL audit tasks.

- Specify the start time, end time, task creation time, and node information to search for SQL audit tasks.
- Click **Add SQL Audit Task** and specify a time range to add a task. You can add an instance- or node-level task based on your service requirements. The added SQL audit task is displayed in the list below.
- Click **Details** in the **Operation** column to view task details. You can specify filters such as **Time Range**, **User**, **Keyword**, or **Database** and click **Query** to search for the SQL statements executed on the current instance. The selected time range must be after the time when the SQL audit task is added.

----End

13 Audit

13.1 DAS Key Operations Supported by CTS

With CTS, you can record DAS key operations for later query, audit, and backtracking.

Table 13-1 Key operations on DAS

Operation	Resource Type	Trace Name
Adding a database login	instance	createConnection
Testing a database login	connection	testConnection
Verifying a database login	connection	verifyConnection
Modifying a database login	connection	modifyConnection
Deleting a database login	connection	batchDeleteConnections
Logging in to a database instance	connection	databaseLoginActions
Logging in to a database instance	connection	dbConnection
Executing a SQL statement	connection	executeSql
Canceling the execution of a SQL statement	connection	cancelExecute
Obtaining result sets	connection	getExecuteResult
Splitting a SQL statement into small SQL statements	connection	splitSql
Formatting a SQL statement	connection	formatSql

Operation	Resource Type	Trace Name
Obtaining the SQL execution plan	connection	getPlan
Editing result sets	connection	editDatas
Exporting result sets	connection	exportData
Closing the SQL window	connection	closeWindow
Obtaining autofill data	connection	autoFill
Deleting executed SQL statements	connection	deleteExecSqlRecord
Creating a task for exporting SQL result sets	connection	createExportSqlResultsetTask
Creating a database export task	connection	createExportDatabaseTask
Creating a quick export task	connection	createExportQuickDatabaseTask
Deleting an export task	connection	deleteExportTask
Stopping an export task	connection	stopExportTask
Creating a task for importing a SQL file	connection	createImportSqlFileTask
Creating a task for importing a CSV file	connection	createImportCsvFileTask
Deleting an import task	connection	deleteImportTask
Stopping an import task	connection	stopImportTask
Creating a test data generation task	connection	createTestDataTask
Deleting a test data generation task	connection	deleteTestDataTask
Stopping a test data generation task	connection	stopTestDataTask-Create
Combining file fragments	connection	mergeFilePart
Uploading file fragments	connection	uploadFilePart
Executing a SQL diagnosis	connection	exeTuning
Creating an OBS bucket	connection	createBucket

13.2 Viewing Traces

Scenarios


After CTS is enabled, the tracker starts recording operations on cloud resources. The last 7 days of operation records are stored on the CTS console.

This section describes how to query the last 7 days of operation records on the CTS console.

NOTE

Before using CTS, you need to enable it. For details, see [Enabling CTS](#).

Procedure

- Step 1** Log in to the management console.
- Step 2** Click **Service List**. Under **Management & Governance**, click **Cloud Trace Service**.
- Step 3** Choose **Trace List** in the navigation pane on the left.
- Step 4** Specify filter criteria to search for the required traces. The following filters are available:
 - **Trace Type, Trace Source, Resource Type, and Search By:** Select a filter from the drop-down list.
When you select **Resource ID** for **Search By**, you also need to select or enter a resource ID.
 - **Operator:** Select a specific operator from the drop-down list.
 - **Trace Status:** Available options include **All trace statuses, Normal, Warning, and Incident**. You can only select one of them.
 - **Time range:** In the upper right corner of the page, specify a time range for querying traces.
- Step 5** Click **Query**.
- Step 6** Locate the required trace and click  on the left of the trace to view its details.
- Step 7** Click **View Trace** in the **Operation** column. In the displayed dialog box, the trace structure details are displayed.
- Step 8** Click **Export** in the upper right corner of the trace list, and CTS exports traces collected in the past 7 days to a CSV file.

For details about key fields in the trace structure, see sections "Trace Structure" and "Trace Examples" in the *Cloud Trace Service User Guide*.

----End

14 Event Monitoring

14.1 Overview

Event monitoring provides event reporting, querying, and alarming functions, which helps you collect key events or cloud resource operational events to Cloud Eye. When specific events occur, Cloud Eye generates alarms for you.

Event monitoring is enabled by default. You can view monitoring details about system events and custom events. For details about system events, see [Events Supported by Event Monitoring](#).

14.2 Viewing Event Monitoring Data

Scenarios

Event monitoring provides event data reporting, query, and alarm reporting. You can collect key events or cloud resource operational events to Cloud Eye. When specific events occur, Cloud Eye generates alarms for you.

Event monitoring is enabled by default. You can view monitoring details about system events and custom events.

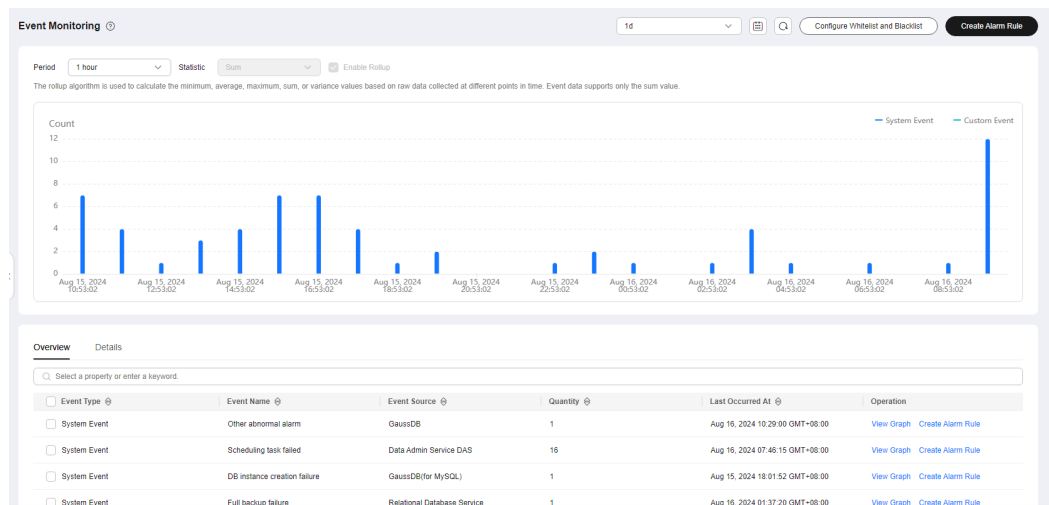
This section describes how to view the event monitoring data.

Procedure

- Step 1** Log in to the Huawei Cloud console.
- Step 2** Click **Service List**. Under **Management & Governance**, click **Cloud Eye**.
- Step 3** In the navigation pane on the left, choose **Event Monitoring**.

On the displayed page, all system events generated in the last 24 hours are displayed by default.

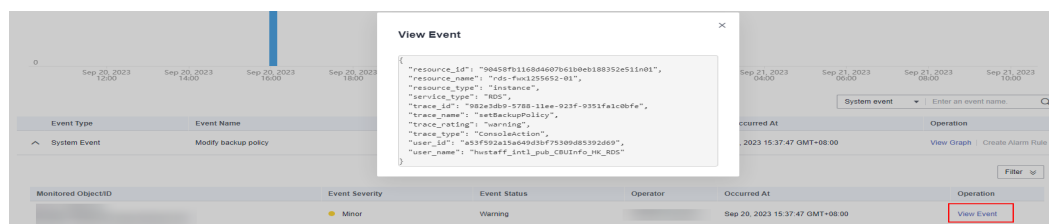
Figure 14-1 Viewing event monitoring information



You can also click **1h**, **3h**, **12h**, **1d**, **7d**, or **30d** to view events generated in different periods.

Step 4 Locate an event and click **View Event** in the **Operation** column to view its details.

Figure 14-2 Viewing events



----End

14.3 Creating an Alarm Rule for Event Monitoring

Scenarios

This section describes how to create an alarm rule to monitor an event.

Procedure


- Step 1** Log in to the management console.
- Step 2** Click  in the upper left corner of the page. Under **Management & Governance**, click **Cloud Eye**.
- Step 3** On the displayed page, in the navigation pane on the left, choose **Event Monitoring**.
- Step 4** On the event list page, click **Create Alarm Rule** in the upper right corner.
- Step 5** On the **Create Alarm Rule** page, configure required parameters.

Table 14-1 Parameter description

Parameter	Description
Name	Name of the policy. The system generates a random name and you can modify it.
Description	(Optional) Supplementary information about the alarm rule.
Alarm Type	Select Event .
Event Type	Event type, which can be System event or Custom event .
Event Source	<ul style="list-style-type: none">• System event: Cloud service the event is generated for. Select Data Admin Service DAS.• Custom event: The event source must be the same as that of the reported fields and written in the service.item format.
Monitoring Scope	Select All resources
Method	The default value is Configure manually .
Alarm Policy	Event Name indicates the instantaneous operations users performed on system resources, such as login and logout. For details, see Events Supported by Event Monitoring . Specify Alarm Policy and Alarm Severity as required.

Table 14-2 Alarm notification parameters

Parameter	Description
Alarm Notification	Whether to notify users when alarms are triggered. Notifications can be sent by email, text message, or HTTP/HTTPS message.
Notification Recipient	You can select a notification group or topic subscription as required.
Notification Group	Notification group the alarm notification is to be sent to. section .
Notification Object	Object that receives alarm notifications. You can select the account contact or a topic. <ul style="list-style-type: none">• Account contact is the mobile phone number and email address of the registered account.• Topic is used to publish messages and subscribe to notifications. If the required topic is unavailable, create one first and add subscriptions to it. For details, see Creating a Topic and Adding Subscriptions.

Parameter	Description
Notification Window	Cloud Eye sends notifications only within the validity period specified in the alarm rule. If Notification Window is set to 08:00-20:00 , Cloud Eye sends notifications only within 08:00-20:00.
Trigger Condition	Condition for triggering an alarm notification.

Table 14-3 Advanced Settings

Parameter	Description
Enterprise Project	Enterprise project that the alarm rule belongs to. Only users with the enterprise project permissions can view and manage the alarm rule.
Tag	A tag is a key-value pair. Tags identify cloud resources so that you can easily categorize and search for your resources. You are advised to create predefined tags on TMS. <ul style="list-style-type: none">• A key can contain a maximum of 128 characters, and a value can contain a maximum of 225 characters.• A maximum of 20 tags can be added.

Step 6 After the configuration is complete, click **Create**.

----End

14.4 Events Supported by Event Monitoring

Table 14-4 Data Admin Service

Event Source	Dimension	Name	Event Severity	Event Description	Handling Suggestion	Impact
DA S	Task Scheduling	Scheduling task failed	Major	The scheduling task failed.	Check whether the instance connection has changed or if the SQL syntax is correct.	Services will be interrupted.

Event Source	Dimension	Name	Event Severity	Event Description	Handling Suggestion	Impact
	Task Scheduling	SQL error during scheduling task execution	Minor	The scheduling task was executed, but a syntax error occurred during SQL statement execution.	Correct the syntax error.	Services may be interrupted.
	Task Scheduling	SQL timeout during scheduling task execution	Minor	The scheduling task was executed, but the SQL statement timed out.	Check whether the SQL statement requires optimization.	Services may be affected.
	Scheduled Backup	Scheduled backup task failed	Major	The scheduled backup task failed.	Check whether the instance connection has changed or if the SQL syntax is correct.	Services may be interrupted.
	Scheduled Backup	SQL timeout during scheduled backup	Minor	The scheduled backup task was executed, but the SQL statement timed out.	Check whether the SQL statement requires optimization.	Services may be affected.