

Data Replication Service

Workload Replay

Issue 04
Date 2024-03-30



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1 Replay Overview

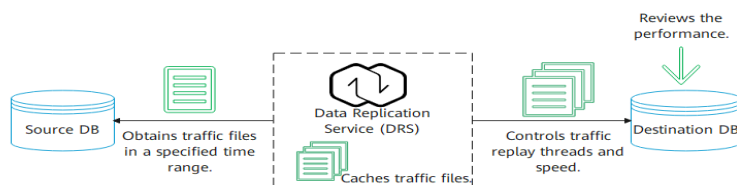
A workload replay task simulates the service load of the source database on the destination database so you can evaluate the effectiveness and performance of the destination database.

A task consists of SQL recording and replay. All of the SQL statements (create, delete, update, and query operations) executed in the required period on the source database will be downloaded by a recording tool from the binlog, and then cached and injected into the destination database where you can trigger a replay and review performance.

Typical Scenarios

- By creating a workload replay task, you can evaluate how the service load of the source database runs on the destination database.
- By specifying the replay thread and speed, you can simulate the peak service load of the source database and analyze the stability of the destination database when workloads increase sharply.

Figure 1-1 Workload replay



Supported Database Types

The following table lists the database types supported by DRS in workload replay.

Table 1-1 Replay scheme

Source DB Type and Version	Destination DB Type and Version	Related Documents
RDS for MySQL	RDS for MySQL	From MySQL to MySQL (Current cloud)
	GaussDB(for MySQL)	From MySQL to GaussDB(for MySQL) (Current cloud)
GaussDB(for MySQL)	GaussDB(for MySQL)	From GaussDB(for MySQL) to GaussDB(for MySQL) (Current cloud)
<ul style="list-style-type: none"> • ECS-hosted MySQL • On-premises MySQL • MySQL on other clouds 	RDS for MySQL	From MySQL to MySQL (To the cloud)
	GaussDB(for MySQL)	From MySQL to GaussDB(for MySQL) (To the cloud)

2 Current Cloud

2.1 From MySQL to MySQL

Supported Source and Destination Databases

Table 2-1 Supported databases

Source DB	Destination DB
RDS for MySQL	RDS for MySQL

Database Account Permission Requirements

When using DRS to create a workload replay task, you are advised to ensure that permissions of the source database account are the same as those of the destination database account before starting the task.

Precautions

To ensure smooth workload replay, read the following notes before creating a task.

Table 2-2 Precautions

Type	Restrictions
Starting a task	<ul style="list-style-type: none"> ● Source database requirements: <ul style="list-style-type: none"> - The source database must be RDS for MySQL. - SQL workload files have been recorded on the source database. For details, see Enabling SQL Audit. ● Destination database requirements: <ul style="list-style-type: none"> - The destination database must be RDS for MySQL. - The destination database version must be the same as or later than the source database version. - Baseline data has been developed in the destination database. The closer the time for collecting baseline data is to the start time for workload capturing on the source database, the more accurate simulation will be for the replay. ● Workload file requirements: <ul style="list-style-type: none"> - If a workload file contains SQL delimiters, a parsing exception may occur. As a result, the replay task fails. - All SQL structures in a workload file must be complete. If a header file is truncated, some SQL parsing will be ignored. - The size of a single SQL statement in a workload file cannot exceed 1 MB. - If other statements are inserted into a transaction, a deadlock may occur. ● Other notes: <ul style="list-style-type: none"> - If configuration parameters (such as innodb_buffer_pool_size and sqlmode) of the source database are inconsistent with those of the destination database, the replay progress may be slow or the replay may fail. - If a workload file is deleted or added during a task editing, you need to select Parse and Reset when resetting the task and then replay the workload file again. For details, see Resetting a Replay Task. - The workload replay process is executed concurrently. DDL statements and DML statements are executed in the same batch (10s), and all the statements may be executed in disorder.
Parsing a workload file	After a parsing file is selected, the file cannot be renamed.
Replaying a database workload	Only SELECT, INSERT, DELETE, UPDATE, and DDLs are supported.

Type	Restrictions
Stopping a task	A finished task cannot be restarted.

Prerequisites

- You have logged in to the DRS console.
- Your account balance is greater than or equal to \$0 USD.
- For details about the DB types and versions supported by workload replay, see [Supported Databases](#).
- If a subaccount is used to create a DRS task, ensure that an agency has been added. To create an agency, see [Agency Management](#).
- You have read [Precautions](#).

Procedure

Step 1 On the **Workload Replay Management** page, click **Create Workload Replay Task**.

Step 2 On the **Create Replay Instance** page, select a region and project, specify the task name, description, and the replay instance details, and click **Create Now**.

- Task information description

Figure 2-1 Workload replay task information

⚠ Only the task name and description can be modified. Other settings cannot be modified after you click Create Now on this page.
The system will create virtual resources immediately after you click Create Now. Virtual resources cannot be modified after being created so no settings except the task name and description can be modified.

Region

Regions are geographic areas isolated from each other. For low network latency and quick resource access, select the nearest region.

Project

* Task Name ⓘ

Description ⓘ

0/256

Table 2-3 Task information

Parameter	Description
Region	The region where the replay instance is deployed. You can change the region.
Project	The project corresponds to the current region and can be changed.

Parameter	Description
Task Name	The task name must start with a letter and consist of 4 to 50 characters. It can contain only letters, digits, hyphens (-), and underscores (_).
Description	The description can contain up to 256 characters and cannot contain special characters !=<>&'\\"

- Replay instance information

Figure 2-2 Replay instance information

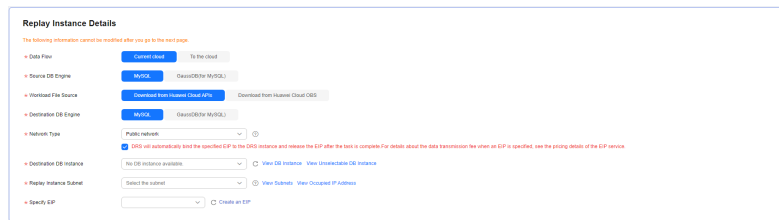


Table 2-4 Replay instance settings

Parameter	Description
Data Flow	Select Current cloud . <ul style="list-style-type: none"> – Current cloud refers to the workload replay scenario where both source and destination databases are Huawei Cloud DB instances. – To the cloud refers to the workload replay scenario where the destination database is a Huawei Cloud DB instance and data needs to be transferred.
Source DB Engine	Select MySQL .
Destination DB Engine	Select MySQL .
Network Type	Public network is used as an example. Available options: Public network, VPC, VPN or Direct Connect
Destination DB Instance	The RDS for MySQL DB instance you created. Ensure that baseline data has been developed in the destination database.

Parameter	Description
Replay Instance Subnet	Select the subnet where the replay instance is located. You can also click View Subnets to go to the network console to view the subnet where the instance resides. By default, the DRS instance and the destination DB instance are in the same subnet. You need to select the subnet where the DRS instance resides, and there are available IP addresses for the subnet. To ensure that the replay instance can be successfully created, only subnets with DHCP enabled are displayed.
Specify EIP	This parameter is available when you select Public network for Network Type . Select an EIP to be bound to the DRS instance. DRS will automatically bind the specified EIP to the DRS instance and unbind the EIP after the task is complete. For details about the data transfer fee generated using a public network, see EIP Price Calculator .

- AZ

Figure 2-3 AZ



Table 2-5 Task AZ

Parameter	Description
AZ	Select the AZ where you want to create the DRS task. Selecting the one housing the source or destination database can provide better performance.

- Enterprise Project and Tags

Figure 2-4 Enterprise Project and Tags

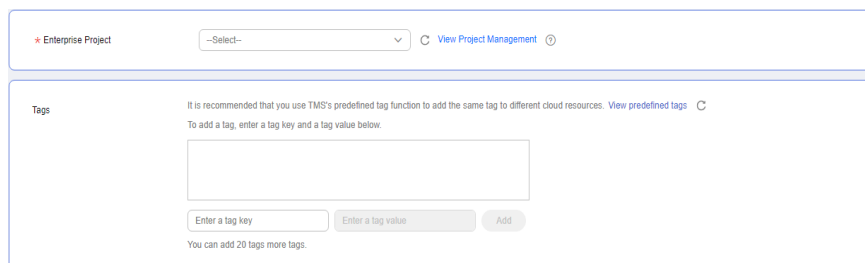


Table 2-6 Enterprise Project and Tags

Parameter	Description
Enterprise Project	<p>An enterprise project you would like to use to centrally manage your cloud resources and members. Select an enterprise project from the drop-down list. The default project is default.</p> <p>For more information about enterprise project, see Enterprise Management User Guide.</p> <p>To customize an enterprise project, click Enterprise in the upper right corner of the console. The Enterprise Project Management Service page is displayed. For details, see Creating an Enterprise Project in <i>Enterprise Management User Guide</i>.</p>
Tags	<ul style="list-style-type: none"> - This setting is optional. Adding tags helps you better identify and manage your tasks. Each task can have up to 20 tags. - If your organization has configured tag policies for DRS, add tags to tasks based on the policies. If a tag does not comply with the policies, task creation may fail. Contact your organization administrator to learn more about tag policies. - After a task is created, you can view its tag details on the Tags tab. For details, see Tag Management.

 **NOTE**

If a task fails to be created, DRS retains the task for three days by default. After three days, the task automatically stops.

Step 3 After the replay instance is created, on the **Configure Source and Destination Databases** page, specify parameters in **Source Database**, **Destination Database**, and **Task Settings**. Then, click **Test Connection** for the destination database to check whether the destination database has been connected to the replay instance. After the connection test is successful, click **Next**.

- Source database information

Figure 2-5 Source database information

Source Database

Workload File Source [Download from Huawei Cloud APIs](#)

DB Instance Name [View DB Instance](#) [View Unselectable DB Instance](#)

Workload Type [Audit log](#)


Time Range 

Table 2-7 Source database settings

Parameter	Description
Workload File Source	Specifies where the workload file in the source database is from.
DB Instance Name	Select an RDS for MySQL DB instance for which SQL workload files have been recorded. For details about how to record SQL workload files, see Enabling SQL Audit .
Workload Type	Only Audit log is supported.
Time Range	Select the time range for audit logs.

- Destination database information

Figure 2-6 Destination database information

Destination Database

DB Instance Name

Database Username

Database Password

SSL Connection

Table 2-8 Destination database settings

Parameter	Description
DB Instance Name	The RDS DB instance you selected when creating the task. This parameter cannot be changed.
Database Username	The username for accessing the destination database.
Database Password	The password for the database username.
SSL Connection	<p>If SSL connection is required, enable SSL on the destination database, ensure that related parameters have been correctly configured, and upload an SSL certificate.</p> <p>NOTE</p> <ul style="list-style-type: none"> - The maximum size of a single certificate file that can be uploaded is 500 KB. - If SSL is disabled, your data may be at risk.

 **NOTE**

The username and password of the destination database are encrypted and temporarily stored on the DRS instance host during the workload replay. After the task is deleted, the username and password are permanently deleted.

- Task Settings

Figure 2-7 Task settings

Task Settings

SQL Type:

Replay Mode: Performance Transaction ?

Filter out SQLs: ?
Add
 You can add 9 more SQLs.

Filter out SQLs Without Conditions: ?

Maximum Concurrent Connections: ?

Acceleration Configuration: ?

Table 2-9 Task settings

Parameter	Description
SQL Type	Select the SQL type to be replayed to the destination database. The default value is SELECT . The available options are SELECT , INSERT , UPDATE , DELETE , and DDL .
Replay Mode	You can select Performance or Transaction . <ul style="list-style-type: none"> – In performance mode, you can set how many concurrent connections are allowed. SQL statements are replayed to the destination database based on a set number of connections. The SQL execution sequence in the source database may be different from that in the destination database. The replay performance is better. – In transaction mode, you cannot set how many concurrent connections are allowed. The number of connections is dynamically adjusted based on the connections in the source database logs to ensure that transaction SQL statements in the same connection of the source database are executed in sequence.
Filter out SQLs	The system fuzzily matches SQL statements based on the entered conditions, ignores case sensitivity, and filters SQL logs to be replayed to the destination database. The SQL logs that meet the conditions will be filtered out. You can configure up to 10 filtering rules.

Parameter	Description
Filter out SQLs Without Conditions	This option is used to filter out SQL statements of the SELECT, UPDATE, and DELETE types that do not contain conditions (that is, filter out SQL statements without a where condition).
Maximum Concurrent Connections	The number of replay threads configured for a workload replay task. The default value is 8 . The value ranges from 1 to 100 .
Acceleration Configuration	The percentage of the replayed SQLs to the SQLs executed on the source database within the same period. The percentage cannot exceed the maximum performance of the workload replay task. The value can be Unlimited , 100% , or 200% .

Step 4 On the **Check Task** page, check the replay task.

- If any check fails, review the cause and rectify the fault. After the fault is rectified, click **Check Again**.
- If all check items are successful, click **Next**.

Step 5 On the displayed page, specify **Start Time**, **Send Notification**, **SMN Topic**, and **Stop Abnormal Tasks After** and confirm that the configured information is correct and click **Submit** to submit the task.

Figure 2-8 Task startup settings

The screenshot shows a configuration interface for task startup settings. It includes the following elements:


- Start Time:** A radio button group with two options: "Start upon task creation" (selected, highlighted in blue) and "Start at a specified time".
- Send Notifications:** A toggle switch that is currently turned on (blue).
- SMN Topic:** A dropdown menu with a refresh icon and a help icon.
- Stop Abnormal Tasks After:** A text input field containing the value "14", followed by a help icon and a red warning message: "Abnormal tasks run longer than the period you set (unit: day) will automatically stop."

Table 2-10 Task startup settings

Parameter	Description
Start Time	Set Start Time to Start upon task creation or Start at a specified time based on site requirements. NOTE After a replay task is started, the performance of the source and destination databases may be affected. You are advised to start a replay task during off-peak hours.

Parameter	Description
Send Notifications	SMN topic. This parameter is optional. If an exception occurs during workload replay, the system will send a notification to the specified recipients.
SMN Topic	This parameter is available only after you enable Send Notifications and create a topic on the SMN console and add a subscriber. For details, see Simple Message Notification User Guide .
Stop Abnormal Tasks After	Number of days after which an abnormal task automatically stops. The value must range from 14 to 100. The default value is 14 . NOTE Tasks in the abnormal state are still charged. If tasks remain in the abnormal state for a long time, they cannot be resumed. Abnormal tasks running longer than the period you set (unit: day) will automatically stop to avoid unnecessary fees.

Step 6 After the task is submitted, view and [manage it](#) on the **Workload Replay Management** page.

- You can view the task status. For more information about task status, see [Task Statuses](#).
- You can click  in the upper right corner to view the latest task status.
- By default, DRS retains a task in the **Configuration** state for three days. After three days, DRS automatically deletes background resources, but the task status remains unchanged. When you reconfigure the task, DRS applies for resources for the task again.

----End

2.2 From MySQL to GaussDB(for MySQL)

Supported Source and Destination Databases

Table 2-11 Supported databases

Source DB	Destination DB
RDS for MySQL	GaussDB(for MySQL)

Database Account Permission Requirements

When using DRS to create a workload replay task, you are advised to ensure that permissions of the source database account are the same as those of the destination database account before starting the task.

Precautions

To ensure smooth workload replay, read the following notes before creating a task.

Table 2-12 Precautions

Type	Restrictions
Starting a task	<ul style="list-style-type: none">● Source database requirements:<ul style="list-style-type: none">- The source database must be RDS for MySQL.- SQL workload files have been recorded on the source database. For details, see Enabling SQL Audit.● Destination database requirements:<ul style="list-style-type: none">- The destination database must be GaussDB(for MySQL).- The destination database version must be the same as or later than the source database version.- Baseline data has been developed in the destination database. The closer the time for collecting baseline data is to the start time for workload capturing on the source database, the more accurate simulation will be for the replay.● Workload file requirements:<ul style="list-style-type: none">- If a workload file contains SQL delimiters, a parsing exception may occur. As a result, the replay task fails.- All SQL structures in a workload file must be complete. If a header file is truncated, some SQL parsing will be ignored.- The size of a single SQL statement in a workload file cannot exceed 1 MB.- If other statements are inserted into a transaction, a deadlock may occur.● Other notes:<ul style="list-style-type: none">- If configuration parameters (such as innodb_buffer_pool_size and sqlmode) of the source database are inconsistent with those of the destination database, the replay progress may be slow or the replay may fail.- If a workload file is deleted or added during a task editing, you need to select Parse and Reset when resetting the task and then replay the workload file again. For details, see Resetting a Replay Task.- The workload replay process is executed concurrently. DDL statements and DML statements are executed in the same batch (10s), and all the statements may be executed in disorder.
Parsing a workload file	After a parsing file is selected, the file cannot be renamed.

Type	Restrictions
Replaying a database workload	Only SELECT, INSERT, DELETE, UPDATE, and DDLs are supported.
Stopping a task	A finished task cannot be restarted.

Prerequisites

- You have logged in to the DRS console.
- Your account balance is greater than or equal to \$0 USD.
- For details about the DB types and versions supported by workload replay, see [Supported Databases](#).
- If a subaccount is used to create a DRS task, ensure that an agency has been added. To create an agency, see [Agency Management](#).
- You have read [Precautions](#).

Procedure

Step 1 On the **Workload Replay Management** page, click **Create Workload Replay Task**.

Step 2 On the **Create Replay Instance** page, select a region and project, specify the task name, description, and the replay instance details, and click **Create Now**.

- Task information description

Figure 2-9 Workload replay task information

⚠ Only the task name and description can be modified. Other settings cannot be modified after you click Create Now on this page.
The system will create virtual resources immediately after you click Create Now. Virtual resources cannot be modified after being created so no settings except the task name and description can be modified.

Region

Regions are geographic areas isolated from each other. For low network latency and quick resource access, select the nearest region.

Project

* Task Name ⓘ

Description ⓘ

0/256

Table 2-13 Task information

Parameter	Description
Region	The region where the replay instance is deployed. You can change the region.

Parameter	Description
Project	The project corresponds to the current region and can be changed.
Task Name	The task name must start with a letter and consist of 4 to 50 characters. It can contain only letters, digits, hyphens (-), and underscores (_).
Description	The description can contain up to 256 characters and cannot contain special characters !=<>&'\"

- Replay instance information

Figure 2-10 Replay instance information

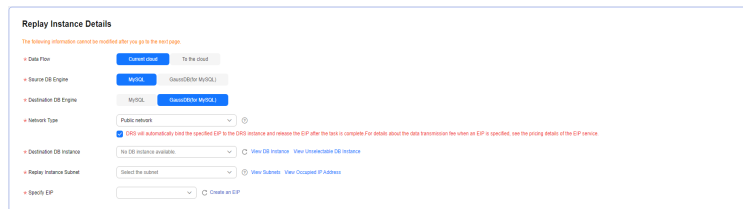


Table 2-14 Replay instance settings

Parameter	Description
Data Flow	Select Current cloud . <ul style="list-style-type: none"> - Current cloud refers to the workload replay scenario where both source and destination databases are Huawei Cloud DB instances. - To the cloud refers to the workload replay scenario where the destination database is a Huawei Cloud DB instance and data needs to be transferred.
Source DB Engine	Select MySQL .
Destination DB Engine	Select GaussDB(for MySQL) .
Network Type	Public network is used as an example. Available options: Public network, VPC, VPN or Direct Connect
Destination DB Instance	The GaussDB(for MySQL) DB instance you created. Ensure that baseline data has been developed in the destination database.

Parameter	Description
Replay Instance Subnet	Select the subnet where the replay instance is located. You can also click View Subnets to go to the network console to view the subnet where the instance resides. By default, the DRS instance and the destination DB instance are in the same subnet. You need to select the subnet where the DRS instance resides, and there are available IP addresses for the subnet. To ensure that the replay instance can be successfully created, only subnets with DHCP enabled are displayed.
Specify EIP	This parameter is available when you select Public network for Network Type . Select an EIP to be bound to the DRS instance. DRS will automatically bind the specified EIP to the DRS instance and unbind the EIP after the task is complete. For details about the data transfer fee generated using a public network, see EIP Price Calculator .

- AZ

Figure 2-11 AZ



Table 2-15 Task AZ

Parameter	Description
AZ	Select the AZ where you want to create the DRS task. Selecting the one housing the source or destination database can provide better performance.

- Enterprise Project and Tags

Figure 2-12 Enterprise Project and Tags

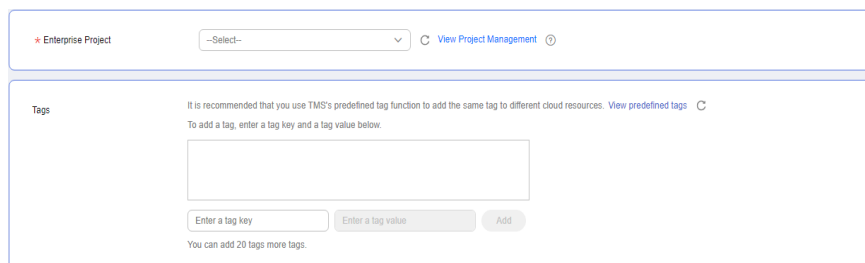


Table 2-16 Enterprise Project and Tags

Parameter	Description
Enterprise Project	<p>An enterprise project you would like to use to centrally manage your cloud resources and members. Select an enterprise project from the drop-down list. The default project is default.</p> <p>For more information about enterprise project, see Enterprise Management User Guide.</p> <p>To customize an enterprise project, click Enterprise in the upper right corner of the console. The Enterprise Project Management Service page is displayed. For details, see Creating an Enterprise Project in <i>Enterprise Management User Guide</i>.</p>
Tags	<ul style="list-style-type: none"> - This setting is optional. Adding tags helps you better identify and manage your tasks. Each task can have up to 20 tags. - If your organization has configured tag policies for DRS, add tags to tasks based on the policies. If a tag does not comply with the policies, task creation may fail. Contact your organization administrator to learn more about tag policies. - After a task is created, you can view its tag details on the Tags tab. For details, see Tag Management.

 **NOTE**

If a task fails to be created, DRS retains the task for three days by default. After three days, the task automatically stops.

Step 3 After the replay instance is created, on the **Configure Source and Destination Databases** page, specify parameters in **Source Database**, **Destination Database**, and **Task Settings**. Then, click **Test Connection** for the destination database to check whether the destination database has been connected to the replay instance. After the connection test is successful, click **Next**.

- Source database information

Figure 2-13 Source database information

Source Database

Workload File Source [Download from Huawei Cloud APIs](#)

DB Instance Name

View DB Instance
View Unselectable DB Instance

Workload Type [Audit log](#)

Time Range

Table 2-17 Source database settings

Parameter	Description
Workload File Source	Specifies where the workload file in the source database is from.
DB Instance Name	Select an RDS for MySQL DB instance for which SQL workload files have been recorded. For details about how to record SQL workload files, see Enabling SQL Audit .
Workload Type	Only Audit log is supported.
Time Range	Select the time range for audit logs.

- Destination database information

Figure 2-14 Destination database information

Destination Database

DB Instance Name

Replay Connection IP Address

Database Username

Database Password

Table 2-18 Destination database settings

Parameter	Description
DB Instance Name	The GaussDB(for MySQL) instance you selected when creating the task. This parameter cannot be changed.
Replay Connection IP Address	The primary node IP address of a DB instance is selected by default, but if the instance has a proxy IP address, you can also select that address if needed.
Database Username	The username for accessing the destination database.
Database Password	The password for the database username.

NOTE

The username and password of the destination database are encrypted and temporarily stored on the DRS instance host during the workload replay. After the task is deleted, the username and password are permanently deleted.

- Task Settings

Figure 2-15 Task settings

Task Settings

SQL Type:

Replay Mode: Performance Transaction ?

Filter out SQLs: ?

 You can add 9 more SQLs.

Filter out SQLs Without Conditions: ?

Maximum Concurrent Connections: ?

Acceleration Configuration: ?

Table 2-19 Task settings

Parameter	Description
SQL Type	Select the SQL type to be replayed to the destination database. The default value is SELECT . The available options are SELECT , INSERT , UPDATE , DELETE , and DDL .
Replay Mode	You can select Performance or Transaction . <ul style="list-style-type: none"> – In performance mode, you can set how many concurrent connections are allowed. SQL statements are replayed to the destination database based on a set number of connections. The SQL execution sequence in the source database may be different from that in the destination database. The replay performance is better. – In transaction mode, you cannot set how many concurrent connections are allowed. The number of connections is dynamically adjusted based on the connections in the source database logs to ensure that transaction SQL statements in the same connection of the source database are executed in sequence.
Filter out SQLs	The system fuzzily matches SQL statements based on the entered conditions, ignores case sensitivity, and filters SQL logs to be replayed to the destination database. The SQL logs that meet the conditions will be filtered out. You can configure up to 10 filtering rules.
Filter out SQLs Without Conditions	This option is used to filter out SQL statements of the SELECT , UPDATE , and DELETE types that do not contain conditions (that is, filter out SQL statements without a where condition).

Parameter	Description
Maximum Concurrent Connections	The number of replay threads configured for a workload replay task. The default value is 8 . The value ranges from 1 to 100 .
Acceleration Configuration	The percentage of the replayed SQLs to the SQLs executed on the source database within the same period. The percentage cannot exceed the maximum performance of the workload replay task. The value can be Unlimited , 100% , or 200% .

- Step 4** On the **Check Task** page, check the replay task.
- If any check fails, review the cause and rectify the fault. After the fault is rectified, click **Check Again**.
 - If all check items are successful, click **Next**.
- Step 5** On the displayed page, specify **Start Time**, **Send Notification**, **SMN Topic**, and **Stop Abnormal Tasks After** and confirm that the configured information is correct and click **Submit** to submit the task.

Figure 2-16 Task startup settings

The screenshot shows the task startup settings interface with the following elements:


- Start Time:** A radio button group with "Start upon task creation" selected (blue) and "Start at a specified time" (grey). A help icon (?) is to the right.
- Send Notifications:** A toggle switch is turned on (blue). A help icon (?) is to the right.
- SMN Topic:** A dropdown menu with a refresh icon (C) and a help icon (?) to the right.
- Stop Abnormal Tasks After:** A text input field containing "14". A help icon (?) is to the right, followed by a red note: "Abnormal tasks run longer than the period you set (unit: day) will automatically stop."

Table 2-20 Task startup settings

Parameter	Description
Start Time	Set Start Time to Start upon task creation or Start at a specified time based on site requirements. NOTE After a replay task is started, the performance of the source and destination databases may be affected. You are advised to start a replay task during off-peak hours.
Send Notifications	SMN topic. This parameter is optional. If an exception occurs during workload replay, the system will send a notification to the specified recipients.

Parameter	Description
SMN Topic	This parameter is available only after you enable Send Notifications and create a topic on the SMN console and add a subscriber. For details, see Simple Message Notification User Guide .
Stop Abnormal Tasks After	Number of days after which an abnormal task automatically stops. The value must range from 14 to 100. The default value is 14 . NOTE Tasks in the abnormal state are still charged. If tasks remain in the abnormal state for a long time, they cannot be resumed. Abnormal tasks running longer than the period you set (unit: day) will automatically stop to avoid unnecessary fees.

Step 6 After the task is submitted, view and [manage it](#) on the **Workload Replay Management** page.

- You can view the task status. For more information about task status, see [Task Statuses](#).
- You can click  in the upper right corner to view the latest task status.
- By default, DRS retains a task in the **Configuration** state for three days. After three days, DRS automatically deletes background resources, but the task status remains unchanged. When you reconfigure the task, DRS applies for resources for the task again.

----End

2.3 From GaussDB(for MySQL) to GaussDB(for MySQL)

Supported Source and Destination Databases

Table 2-21 Supported databases

Source DB	Destination DB
GaussDB(for MySQL)	GaussDB(for MySQL)

Database Account Permission Requirements

When using DRS to create a workload replay task, you are advised to ensure that permissions of the source database account are the same as those of the destination database account before starting the task.

Precautions

To ensure smooth workload replay, read the following notes before creating a task.

Table 2-22 Precautions

Type	Restrictions
Starting a task	<ul style="list-style-type: none">● Source database requirements:<ul style="list-style-type: none">- The source database must be GaussDB(for MySQL).- SQL Explorer has been enabled on the source database. For details, see Enabling or Disabling SQL Explorer. Enabling SQL Explorer will affect the performance of the source database. Evaluate the impact before enabling SQL Explorer.● Destination database requirements:<ul style="list-style-type: none">- The destination database must be GaussDB(for MySQL).- Baseline data has been developed in the destination database. The closer the time for collecting baseline data is to the start time for workload capturing on the source database, the more accurate simulation will be for the replay.● Workload file requirements:<ul style="list-style-type: none">- In earlier versions, the formats of files generated using GaussDB(for MySQL) SQL Explorer are different. Currently, all SQL statements of GaussDB(for MySQL) 2.0.8.3 to 2.0.28.15 and later patch versions 2.0.28.xx can be parsed.- By default, the maximum size of a SQL statement for GaussDB(for MySQL) is 4 KB. If the size of a SQL statement exceeds the default value, you need to change the value of the <code>rds_sql_tracer_max_record_size</code> parameter by referring to Modifying a Parameter Template. Otherwise, the statement whose size exceeds the default value will not be recorded and cannot be replayed.- If a workload file contains SQL delimiters (such as <code>^^</code>), a parsing exception may occur. As a result, the replay task fails.- All SQL structures in a workload file must be complete. If a header file is truncated, some SQL parsing will be ignored.- The size of a single SQL statement in a workload file cannot exceed 1 MB.- If other statements are inserted into a transaction, a deadlock may occur.● Other notes:<ul style="list-style-type: none">- If configuration parameters (such as <code>innodb_buffer_pool_size</code> and <code>sqlmode</code>) of the source database are inconsistent with those of the destination database, the replay progress may be slow or the replay may fail.

Type	Restrictions
	<ul style="list-style-type: none"> - If a workload file is deleted or added during a task editing, you need to select Parse and Reset when resetting the task and then replay the workload file again. For details, see Resetting a Replay Task. - The workload replay process is executed concurrently. DDL statements and DML statements are executed in the same batch (10s), and all the statements may be executed in disorder.
Parsing a workload file	After a parsing file is selected, the file cannot be renamed.
Replaying a database workload	Only SELECT, INSERT, DELETE, UPDATE, and DDLs are supported.
Stopping a task	A finished task cannot be restarted.

Prerequisites

- [You have logged in to the DRS console.](#)
- Your account balance is greater than or equal to \$0 USD.
- For details about the DB types and versions supported by workload replay, see [Supported Databases](#).
- If a subaccount is used to create a DRS task, ensure that an agency has been added. To create an agency, see [Agency Management](#).
- You have read [Precautions](#).

Procedure

Step 1 On the **Workload Replay Management** page, click **Create Workload Replay Task**.

Step 2 On the **Create Replay Instance** page, select a region and project, specify the task name, description, and the replay instance details, and click **Create Now**.

- Task information description

Figure 2-17 Workload replay task information

⚠ Only the task name and description can be modified. Other settings cannot be modified after you click Create Now on this page.
The system will create virtual resources immediately after you click Create Now. Virtual resources cannot be modified after being created so no settings except the task name and description can be modified.

Region .. v

Regions are geographic areas isolated from each other. For low network latency and quick resource access, select the nearest region.

Project v

* Task Name ⓘ

Description ⓘ

0/256

Table 2-23 Task information

Parameter	Description
Region	The region where the replay instance is deployed. You can change the region.
Project	The project corresponds to the current region and can be changed.
Task Name	The task name must start with a letter and consist of 4 to 50 characters. It can contain only letters, digits, hyphens (-), and underscores (_).
Description	The description can contain up to 256 characters and cannot contain special characters !=<>&'\\"

- Replay instance information

Figure 2-18 Replay instance information

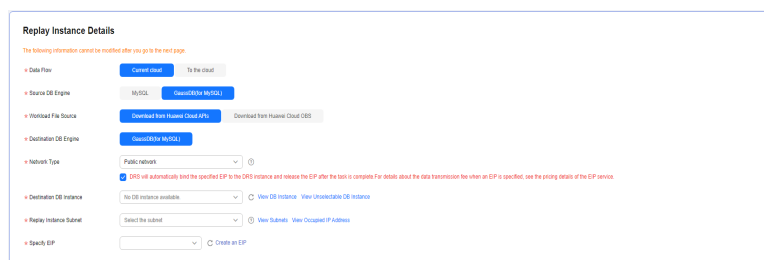


Table 2-24 Replay instance settings

Parameter	Description
Data Flow	Select Current cloud . <ul style="list-style-type: none"> - Current cloud refers to the workload replay scenario where both source and destination databases are Huawei Cloud DB instances. - To the cloud refers to the workload replay scenario where the destination database is a Huawei Cloud DB instance and data needs to be transferred.
Source DB Engine	Select GaussDB(for MySQL) .
Destination DB Engine	Select GaussDB(for MySQL) .
Network Type	Public network is used as an example. Available options: Public network, VPC, VPN or Direct Connect

Parameter	Description
Destination DB Instance	The GaussDB(for MySQL) DB instance you created. Ensure that baseline data has been developed in the destination database.
Replay Instance Subnet	Select the subnet where the replay instance is located. You can also click View Subnets to go to the network console to view the subnet where the instance resides. By default, the DRS instance and the destination DB instance are in the same subnet. You need to select the subnet where the DRS instance resides, and there are available IP addresses for the subnet. To ensure that the replay instance can be successfully created, only subnets with DHCP enabled are displayed.
Specify EIP	This parameter is available when you select Public network for Network Type . Select an EIP to be bound to the DRS instance. DRS will automatically bind the specified EIP to the DRS instance and unbind the EIP after the task is complete. For details about the data transfer fee generated using a public network, see EIP Price Calculator .

- AZ

Figure 2-19 AZ

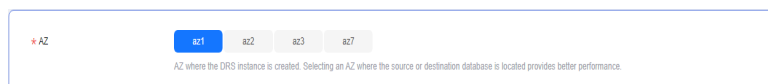


Table 2-25 Task AZ

Parameter	Description
AZ	Select the AZ where you want to create the DRS task. Selecting the one housing the source or destination database can provide better performance.

- Enterprise Project and Tags

Figure 2-20 Enterprise Project and Tags

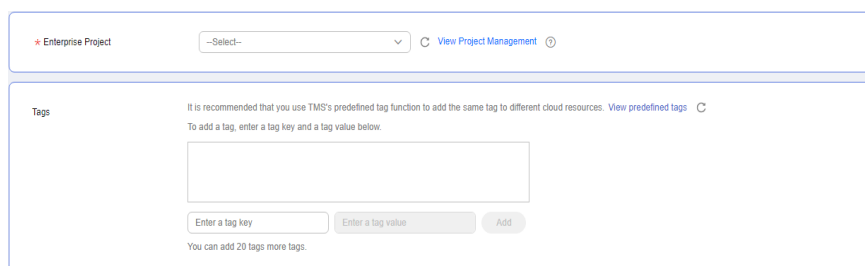


Table 2-26 Enterprise Project and Tags

Parameter	Description
Enterprise Project	<p>An enterprise project you would like to use to centrally manage your cloud resources and members. Select an enterprise project from the drop-down list. The default project is default.</p> <p>For more information about enterprise project, see Enterprise Management User Guide.</p> <p>To customize an enterprise project, click Enterprise in the upper right corner of the console. The Enterprise Project Management Service page is displayed. For details, see Creating an Enterprise Project in <i>Enterprise Management User Guide</i>.</p>
Tags	<ul style="list-style-type: none"> - This setting is optional. Adding tags helps you better identify and manage your tasks. Each task can have up to 20 tags. - If your organization has configured tag policies for DRS, add tags to tasks based on the policies. If a tag does not comply with the policies, task creation may fail. Contact your organization administrator to learn more about tag policies. - After a task is created, you can view its tag details on the Tags tab. For details, see Tag Management.

 **NOTE**

If a task fails to be created, DRS retains the task for three days by default. After three days, the task automatically stops.

Step 3 After the replay instance is created, on the **Configure Source and Destination Databases** page, specify parameters in **Source Database**, **Destination Database**, and **Task Settings**. Then, click **Test Connection** for the destination database to check whether the destination database has been connected to the replay instance. After the connection test is successful, click **Next**.

- Source database information

Figure 2-21 Source database information

Source Database

Workload File Source Download from Huawei Cloud APIs

DB Instance Name Select an instance [View DB Instance](#) [View Unselectable DB Instance](#)

Workload Type Audit log

Time Range Start Date – End Date

Table 2-27 Source database settings

Parameter	Description
Workload File Source	Specifies where the workload file in the source database is from.
DB Instance Name	Select a GaussDB(for MySQL) DB instance for which SQL Explorer has been enabled. For details about how to enable SQL Explorer, see Enabling or Disabling SQL Explorer .
Workload Type	Only SQL Explorer is supported.
Time Range	Select the time range for audit logs.

- Destination database information

Figure 2-22 Destination database information

Destination Database

DB Instance Name

Replay Connection IP Address

Database Username

Database Password

Table 2-28 Destination database settings

Parameter	Description
DB Instance Name	The GaussDB(for MySQL) instance you selected when creating the task. This parameter cannot be changed.
Replay Connection IP Address	The primary node IP address of a DB instance is selected by default, but if the instance has a proxy IP address, you can also select that address if needed.
Database Username	The username for accessing the destination database.
Database Password	The password for the database username.

 **NOTE**

The username and password of the destination database are encrypted and temporarily stored on the DRS instance host during the workload replay. After the task is deleted, the username and password are permanently deleted.

- Task Settings

Figure 2-23 Task settings

Task Settings

SQL Type:

Replay Mode: Performance Transaction ?

Filter out SQLs: ?
 Add
 You can add 9 more SQLs.

Filter out SQLs Without Conditions: ?

Maximum Concurrent Connections: ?

Acceleration Configuration: ?

Table 2-29 Task settings

Parameter	Description
SQL Type	Select the SQL type to be replayed to the destination database. The default value is SELECT . The available options are SELECT , INSERT , UPDATE , DELETE , and DDL .
Replay Mode	You can select Performance or Transaction . <ul style="list-style-type: none"> – In performance mode, you can set how many concurrent connections are allowed. SQL statements are replayed to the destination database based on a set number of connections. The SQL execution sequence in the source database may be different from that in the destination database. The replay performance is better. – In transaction mode, you cannot set how many concurrent connections are allowed. The number of connections is dynamically adjusted based on the connections in the source database logs to ensure that transaction SQL statements in the same connection of the source database are executed in sequence.
Filter out SQLs	The system fuzzily matches SQL statements based on the entered conditions, ignores case sensitivity, and filters SQL logs to be replayed to the destination database. The SQL logs that meet the conditions will be filtered out. You can configure up to 10 filtering rules.

Parameter	Description
Filter out SQLs Without Conditions	This option is used to filter out SQL statements of the SELECT, UPDATE, and DELETE types that do not contain conditions (that is, filter out SQL statements without a where condition).
Maximum Concurrent Connections	The number of replay threads configured for a workload replay task. The default value is 8 . The value ranges from 1 to 100 .
Acceleration Configuration	The percentage of the replayed SQLs to the SQLs executed on the source database within the same period. The percentage cannot exceed the maximum performance of the workload replay task. The value can be Unlimited , 100% , or 200% .

Step 4 On the **Check Task** page, check the replay task.

- If any check fails, review the cause and rectify the fault. After the fault is rectified, click **Check Again**.
- If all check items are successful, click **Next**.

Step 5 On the displayed page, specify **Start Time**, **Send Notification**, **SMN Topic**, and **Stop Abnormal Tasks After** and confirm that the configured information is correct and click **Submit** to submit the task.

Figure 2-24 Task startup settings

The screenshot shows the task startup settings interface. It includes the following elements:


- Start Time:** A radio button group with "Start upon task creation" selected (highlighted in blue) and "Start at a specified time" (greyed out). A help icon (?) is present.
- Send Notifications:** A toggle switch is turned on (blue), with a help icon (?) next to it.
- SMN Topic:** A dropdown menu with a downward arrow, a refresh icon (C), and a help icon (?).
- Stop Abnormal Tasks After:** A text input field containing the number "14". A help icon (?) is followed by the text: "Abnormal tasks run longer than the period you set (unit: day) will automatically stop."

Table 2-30 Task startup settings

Parameter	Description
Start Time	Set Start Time to Start upon task creation or Start at a specified time based on site requirements. NOTE After a replay task is started, the performance of the source and destination databases may be affected. You are advised to start a replay task during off-peak hours.

Parameter	Description
Send Notifications	SMN topic. This parameter is optional. If an exception occurs during workload replay, the system will send a notification to the specified recipients.
SMN Topic	This parameter is available only after you enable Send Notifications and create a topic on the SMN console and add a subscriber. For details, see Simple Message Notification User Guide .
Stop Abnormal Tasks After	Number of days after which an abnormal task automatically stops. The value must range from 14 to 100. The default value is 14 . NOTE Tasks in the abnormal state are still charged. If tasks remain in the abnormal state for a long time, they cannot be resumed. Abnormal tasks running longer than the period you set (unit: day) will automatically stop to avoid unnecessary fees.

Step 6 After the task is submitted, view and [manage it](#) on the **Workload Replay Management** page.

- You can view the task status. For more information about task status, see [Task Statuses](#).
- You can click  in the upper right corner to view the latest task status.
- By default, DRS retains a task in the **Configuration** state for three days. After three days, DRS automatically deletes background resources, but the task status remains unchanged. When you reconfigure the task, DRS applies for resources for the task again.

----End

3 To the cloud

3.1 From MySQL to MySQL

Supported Source and Destination Databases

Table 3-1 Supported databases

Source DB	Destination DB
<ul style="list-style-type: none">ECS-hosted MySQL 5.6, 5.7, and 8.0On-premises MySQL 5.6, 5.7, and 8.0MySQL 5.6, 5.7, and 8.0 on other clouds	RDS for MySQL

Database Account Permission Requirements

When using DRS to create a workload replay task, you are advised to ensure that permissions of the source database account are the same as those of the destination database account before starting the task.

Precautions

To ensure smooth workload replay, read the following notes before creating a task.

Table 3-2 Precautions

Type	Restrictions
Starting a task	<ul style="list-style-type: none">● Source database requirements:<ul style="list-style-type: none">- The source database can be a self-managed MySQL database or a MySQL database on other clouds (such as ApsaraDB RDS for MySQL and PolarDB for MySQL). You can enable and export audit logs or insight logs.- SQL workload files have been recorded on the source database and uploaded to an OBS bucket on Huawei Cloud. DRS obtains the workload files from the OBS bucket.● Destination database requirements:<ul style="list-style-type: none">- The destination database must be RDS for MySQL.- The destination database version must be the same as or later than the source database version.- Baseline data has been developed in the destination database. The closer the time for collecting baseline data is to the start time for workload capturing on the source database, the more accurate simulation will be for the replay.● Workload file requirements:<ul style="list-style-type: none">- If a workload file contains SQL delimiters, a parsing exception may occur. As a result, the replay task fails.- All SQL structures in a workload file must be complete. If a header file is truncated, some SQL parsing will be ignored.- The size of a single SQL statement in a workload file cannot exceed 1 MB.- If other statements are inserted into a transaction, a deadlock may occur.- Only .gz and .zip files can be uploaded.● Other notes:<ul style="list-style-type: none">- If configuration parameters (such as innodb_buffer_pool_size and sqlmode) of the source database are inconsistent with those of the destination database, the replay progress may be slow or the replay may fail.- If a workload file is deleted or added during a task editing, you need to select Parse and Reset when resetting the task and then replay the workload file again. For details, see Resetting a Replay Task.- The workload replay process is executed concurrently. DDL statements and DML statements are executed in the same batch (10s), and all the statements may be executed in disorder.

Type	Restrictions
Parsing a workload file	After a parsing file is selected, the file cannot be renamed.
Replaying a database workload	Only SELECT, INSERT, DELETE, UPDATE, and DDLs are supported.
Stopping a task	A finished task cannot be restarted.

Prerequisites

- You have logged in to the DRS console.
- Your account balance is greater than or equal to \$0 USD.
- For details about the DB types and versions supported by workload replay, see [Supported Databases](#).
- If a subaccount is used to create a DRS task, ensure that an agency has been added. To create an agency, see [Agency Management](#).
- You have read [Precautions](#).

Procedure

Step 1 On the **Workload Replay Management** page, click **Create Workload Replay Task**.

Step 2 On the **Create Replay Instance** page, select a region and project, specify the task name, description, and the replay instance details, and click **Create Now**.

- Task information description

Figure 3-1 Workload replay task information

⚠ Only the task name and description can be modified. Other settings cannot be modified after you click Create Now on this page.
The system will create virtual resources immediately after you click Create Now. Virtual resources cannot be modified after being created so no settings except the task name and description can be modified.

Region

Regions are geographic areas isolated from each other. For low network latency and quick resource access, select the nearest region.

Project

* Task Name ⓘ

Description ⓘ

0/256

Table 3-3 Task information

Parameter	Description
Region	The region where the replay instance is deployed. You can change the region.
Project	The project corresponds to the current region and can be changed.
Task Name	The task name must start with a letter and consist of 4 to 50 characters. It can contain only letters, digits, hyphens (-), and underscores (_).
Description	The description can contain up to 256 characters and cannot contain special characters !=<>&'\"

- Replay instance information

Figure 3-2 Replay instance information

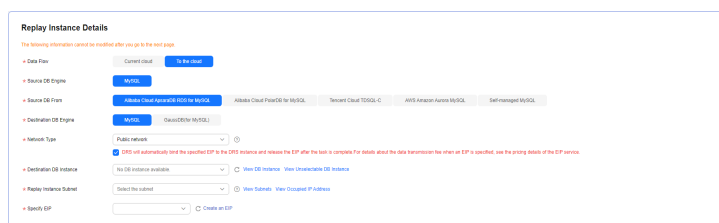


Table 3-4 Replay instance settings

Parameter	Description
Data Flow	Select To the cloud . <ul style="list-style-type: none"> – Current cloud refers to the workload replay scenario where both source and destination databases are Huawei Cloud DB instances. – To the cloud refers to the workload replay scenario where the destination database is a Huawei Cloud DB instance and data needs to be transferred.
Source DB Engine	Select MySQL .
Source DB From	Platform where the source database is from. The audit log format varies depending on the source database. For details, see Audit Log Format .
Destination DB Engine	Select MySQL .

Parameter	Description
Network Type	Public network is used as an example. Available options: Public network, VPC, VPN or Direct Connect
Destination DB Instance	The RDS for MySQL DB instance you created. Ensure that baseline data has been developed in the destination database.
Replay Instance Subnet	Select the subnet where the replay instance is located. You can also click View Subnets to go to the network console to view the subnet where the instance resides. By default, the DRS instance and the destination DB instance are in the same subnet. You need to select the subnet where the DRS instance resides, and there are available IP addresses for the subnet. To ensure that the replay instance can be successfully created, only subnets with DHCP enabled are displayed.
Specify EIP	This parameter is available when you select Public network for Network Type . Select an EIP to be bound to the DRS instance. DRS will automatically bind the specified EIP to the DRS instance and unbind the EIP after the task is complete. For details about the data transfer fee generated using a public network, see EIP Price Calculator .

- AZ

Figure 3-3 AZ



Table 3-5 Task AZ

Parameter	Description
AZ	Select the AZ where you want to create the DRS task. Selecting the one housing the source or destination database can provide better performance.

- Enterprise Project and Tags

Figure 3-4 Enterprise Project and Tags

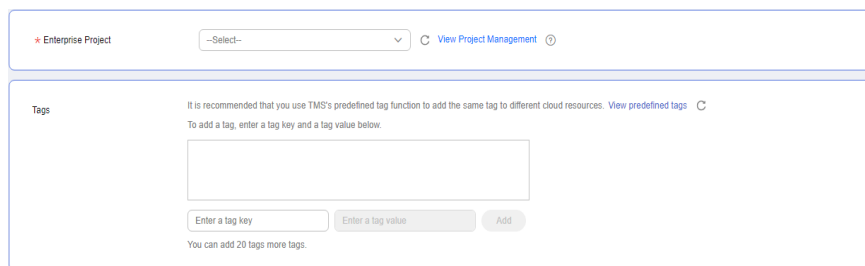


Table 3-6 Enterprise Project and Tags

Parameter	Description
Enterprise Project	<p>An enterprise project you would like to use to centrally manage your cloud resources and members. Select an enterprise project from the drop-down list. The default project is default.</p> <p>For more information about enterprise project, see Enterprise Management User Guide.</p> <p>To customize an enterprise project, click Enterprise in the upper right corner of the console. The Enterprise Project Management Service page is displayed. For details, see Creating an Enterprise Project in <i>Enterprise Management User Guide</i>.</p>
Tags	<ul style="list-style-type: none"> - This setting is optional. Adding tags helps you better identify and manage your tasks. Each task can have up to 20 tags. - If your organization has configured tag policies for DRS, add tags to tasks based on the policies. If a tag does not comply with the policies, task creation may fail. Contact your organization administrator to learn more about tag policies. - After a task is created, you can view its tag details on the Tags tab. For details, see Tag Management.

NOTE

If a task fails to be created, DRS retains the task for three days by default. After three days, the task automatically stops.

Step 3 After the replay instance is created, on the **Configure Source and Destination Databases** page, specify parameters in **Source Database**, **Destination Database**, and **Task Settings**. Then, click **Test Connection** for the destination database to check whether the destination database has been connected to the replay instance. After the connection test is successful, click **Next**.

- Source database information

Figure 3-5 Source database information

Table 3-7 Source database settings

Parameter	Description
Workload File Source	Specifies where the workload file in the source database is from.
Access Key ID (AK)	Access key ID, which is a unique identifier used in conjunction with a secret access key to sign requests cryptographically.
Secret Access Key (SK)	Used together with the access key ID to sign requests cryptographically. It identifies a request sender and prevents the request from being modified. Based on the principle of least permission, you can use temporary or permanent AKs/SKs. You are advised to use a temporary AK/SK .
Security Token	When a temporary AK/SK is used, Security Token must be used, and the recommended validity period is 24 hours. Otherwise, OBS bucket information may fail to be obtained during workload replay.
Bucket Name	Name of the OBS bucket for storing workload files.
Endpoint	OBS provides an endpoint for each region. An endpoint can be considered as the domain name of OBS in a region, and is used to process access requests from the region.
Workload File Prefix	Prefix of a file name in the OBS bucket. Only files whose names start with this prefix will be displayed.
Workload Type	Only Audit log is supported.
Workload File	Select the required workload file.

- Destination database information

Figure 3-6 Destination database information

Destination Database

DB Instance Name

Database Username

Database Password

SSL Connection

Table 3-8 Destination database settings

Parameter	Description
DB Instance Name	The RDS DB instance you selected when creating the task. This parameter cannot be changed.
Database Username	The username for accessing the destination database.
Database Password	The password for the database username.
SSL Connection	<p>If SSL connection is required, enable SSL on the destination database, ensure that related parameters have been correctly configured, and upload an SSL certificate.</p> <p>NOTE</p> <ul style="list-style-type: none"> - The maximum size of a single certificate file that can be uploaded is 500 KB. - If SSL is disabled, your data may be at risk.

NOTE

The username and password of the destination database are encrypted and temporarily stored on the DRS instance host during the workload replay. After the task is deleted, the username and password are permanently deleted.

- Task Settings

Figure 3-7 Task settings

Task Settings

SQL Type:

Replay Mode: Performance Transaction ?

Filter out SQLs: ?
Add
You can add 9 more SQLs.

Filter out SQLs Without Conditions: ?

Maximum Concurrent Connections: ?

Acceleration Configuration: ?

Table 3-9 Task settings

Parameter	Description
SQL Type	Select the SQL type to be replayed to the destination database. The default value is SELECT . The available options are SELECT , INSERT , UPDATE , DELETE , and DDL .
Replay Mode	You can select Performance or Transaction . <ul style="list-style-type: none"> - In performance mode, you can set how many concurrent connections are allowed. SQL statements are replayed to the destination database based on a set number of connections. The SQL execution sequence in the source database may be different from that in the destination database. The replay performance is better. - In transaction mode, you cannot set how many concurrent connections are allowed. The number of connections is dynamically adjusted based on the connections in the source database logs to ensure that transaction SQL statements in the same connection of the source database are executed in sequence.
Filter out SQLs	The system fuzzily matches SQL statements based on the entered conditions, ignores case sensitivity, and filters SQL logs to be replayed to the destination database. The SQL logs that meet the conditions will be filtered out. You can configure up to 10 filtering rules.
Filter out SQLs Without Conditions	This option is used to filter out SQL statements of the SELECT , UPDATE , and DELETE types that do not contain conditions (that is, filter out SQL statements without a where condition).

Parameter	Description
Maximum Concurrent Connections	The number of replay threads configured for a workload replay task. The default value is 8 . The value ranges from 1 to 100 .
Acceleration Configuration	The percentage of the replayed SQLs to the SQLs executed on the source database within the same period. The percentage cannot exceed the maximum performance of the workload replay task. The value can be Unlimited , 100% , or 200% .

- Step 4** On the **Check Task** page, check the replay task.
- If any check fails, review the cause and rectify the fault. After the fault is rectified, click **Check Again**.
 - If all check items are successful, click **Next**.
- Step 5** On the displayed page, specify **Start Time**, **Send Notification**, **SMN Topic**, and **Stop Abnormal Tasks After** and confirm that the configured information is correct and click **Submit** to submit the task.


Figure 3-8 Task startup settings

Table 3-10 Task startup settings

Parameter	Description
Start Time	Set Start Time to Start upon task creation or Start at a specified time based on site requirements. NOTE After a replay task is started, the performance of the source and destination databases may be affected. You are advised to start a replay task during off-peak hours.
Send Notifications	SMN topic. This parameter is optional. If an exception occurs during workload replay, the system will send a notification to the specified recipients.

Parameter	Description
SMN Topic	This parameter is available only after you enable Send Notifications and create a topic on the SMN console and add a subscriber. For details, see Simple Message Notification User Guide .
Stop Abnormal Tasks After	Number of days after which an abnormal task automatically stops. The value must range from 14 to 100. The default value is 14 . NOTE Tasks in the abnormal state are still charged. If tasks remain in the abnormal state for a long time, they cannot be resumed. Abnormal tasks running longer than the period you set (unit: day) will automatically stop to avoid unnecessary fees.

Step 6 After the task is submitted, view and [manage it](#) on the **Workload Replay Management** page.

- You can view the task status. For more information about task status, see [Task Statuses](#).
- You can click  in the upper right corner to view the latest task status.
- By default, DRS retains a task in the **Configuration** state for three days. After three days, DRS automatically deletes background resources, but the task status remains unchanged. When you reconfigure the task, DRS applies for resources for the task again.

----End

3.2 From MySQL to GaussDB(for MySQL)

Supported Source and Destination Databases

Table 3-11 Supported databases

Source DB	Destination DB
<ul style="list-style-type: none"> • ECS-hosted MySQL 5.6, 5.7, and 8.0 • On-premises MySQL 5.6, 5.7, and 8.0 • MySQL 5.6, 5.7, and 8.0 on other clouds 	GaussDB(for MySQL)

Database Account Permission Requirements

When using DRS to create a workload replay task, you are advised to ensure that permissions of the source database account are the same as those of the destination database account before starting the task.

Precautions

To ensure smooth workload replay, read the following notes before creating a task.

Table 3-12 Precautions

Type	Restrictions
Starting a task	<ul style="list-style-type: none"> ● Source database requirements: <ul style="list-style-type: none"> - The source database can be a self-managed MySQL database or a MySQL database on other clouds (such as ApsaraDB RDS for MySQL and PolarDB for MySQL). You can enable and export audit logs or insight logs. - SQL workload files have been recorded on the source database and uploaded to an OBS bucket on Huawei Cloud. DRS obtains the workload files from the OBS bucket. ● Destination database requirements: <ul style="list-style-type: none"> - The destination database must be GaussDB(for MySQL). - Baseline data has been developed in the destination database. The closer the time for collecting baseline data is to the start time for workload capturing on the source database, the more accurate simulation will be for the replay. ● Workload file requirements: <ul style="list-style-type: none"> - If a workload file contains SQL delimiters (such as ^^), a parsing exception may occur. As a result, the replay task fails. - All SQL structures in a workload file must be complete. If a header file is truncated, some SQL parsing will be ignored. - The size of a single SQL statement in a workload file cannot exceed 1 MB. - If other statements are inserted into a transaction, a deadlock may occur. - Only .gz and .zip files can be uploaded. ● Other notes: <ul style="list-style-type: none"> - If configuration parameters (such as innodb_buffer_pool_size and sqlmode) of the source database are inconsistent with those of the destination database, the replay progress may be slow or the replay may fail. - If a workload file is deleted or added during a task editing, you need to select Parse and Reset when resetting the task and then replay the workload file again. For details, see Resetting a Replay Task. - The workload replay process is executed concurrently. DDL statements and DML statements are executed in the same batch (10s), and all the statements may be executed in disorder.
Parsing a workload file	After a parsing file is selected, the file cannot be renamed.

Type	Restrictions
Replaying a database workload	Only SELECT, INSERT, DELETE, UPDATE, and DDLs are supported.
Stopping a task	A finished task cannot be restarted.

Prerequisites

- You have logged in to the DRS console.
- Your account balance is greater than or equal to \$0 USD.
- For details about the DB types and versions supported by workload replay, see [Supported Databases](#).
- If a subaccount is used to create a DRS task, ensure that an agency has been added. To create an agency, see [Agency Management](#).
- You have read [Precautions](#).

Procedure

Step 1 On the **Workload Replay Management** page, click **Create Workload Replay Task**.

Step 2 On the **Create Replay Instance** page, select a region and project, specify the task name, description, and the replay instance details, and click **Create Now**.

- Task information description

Figure 3-9 Workload replay task information

⚠ Only the task name and description can be modified. Other settings cannot be modified after you click Create Now on this page.
The system will create virtual resources immediately after you click Create Now. Virtual resources cannot be modified after being created so no settings except the task name and description can be modified.

Region

Regions are geographic areas isolated from each other. For low network latency and quick resource access, select the nearest region.

Project

* Task Name ⓘ

Description ⓘ

0/256

Table 3-13 Task information

Parameter	Description
Region	The region where the replay instance is deployed. You can change the region.

Parameter	Description
Project	The project corresponds to the current region and can be changed.
Task Name	The task name must start with a letter and consist of 4 to 50 characters. It can contain only letters, digits, hyphens (-), and underscores (_).
Description	The description can contain up to 256 characters and cannot contain special characters !=<>&'\"

- Replay instance information

Figure 3-10 Replay instance information

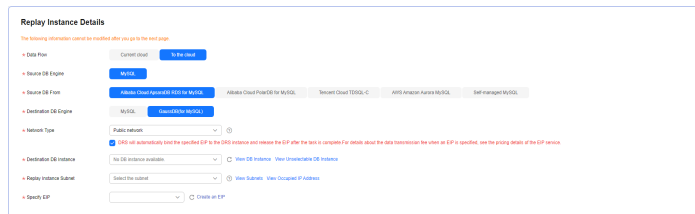


Table 3-14 Replay instance settings

Parameter	Description
Data Flow	Select To the cloud . <ul style="list-style-type: none"> – Current cloud refers to the workload replay scenario where both source and destination databases are Huawei Cloud DB instances. – To the cloud refers to the workload replay scenario where the destination database is a Huawei Cloud DB instance and data needs to be transferred.
Source DB Engine	Select MySQL .
Source DB From	Platform where the source database is from. The audit log format varies depending on the source database. For details, see Audit Log Format .
Destination DB Engine	Select GaussDB(for MySQL) .
Network Type	Public network is used as an example. Available options: Public network, VPC, VPN or Direct Connect
Destination DB Instance	The GaussDB(for MySQL) DB instance you created. Ensure that baseline data has been developed in the destination database.

Parameter	Description
Replay Instance Subnet	Select the subnet where the replay instance is located. You can also click View Subnets to go to the network console to view the subnet where the instance resides. By default, the DRS instance and the destination DB instance are in the same subnet. You need to select the subnet where the DRS instance resides, and there are available IP addresses for the subnet. To ensure that the replay instance can be successfully created, only subnets with DHCP enabled are displayed.
Specify EIP	This parameter is available when you select Public network for Network Type . Select an EIP to be bound to the DRS instance. DRS will automatically bind the specified EIP to the DRS instance and unbind the EIP after the task is complete. For details about the data transfer fee generated using a public network, see EIP Price Calculator .

- AZ

Figure 3-11 AZ

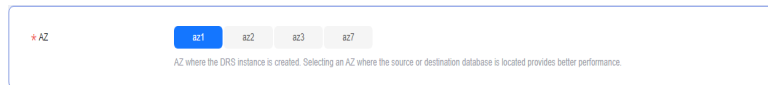


Table 3-15 Task AZ

Parameter	Description
AZ	Select the AZ where you want to create the DRS task. Selecting the one housing the source or destination database can provide better performance.

- Enterprise Project and Tags

Figure 3-12 Enterprise Project and Tags

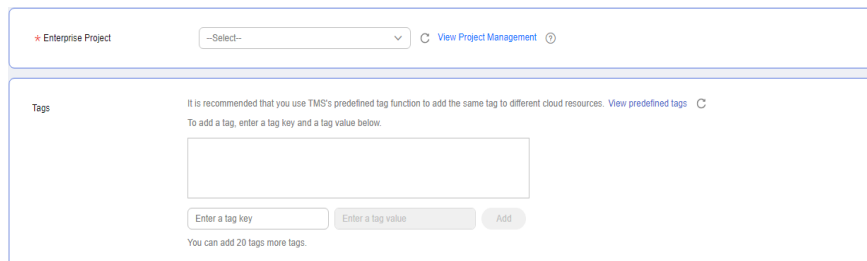


Table 3-16 Enterprise Project and Tags

Parameter	Description
Enterprise Project	<p>An enterprise project you would like to use to centrally manage your cloud resources and members. Select an enterprise project from the drop-down list. The default project is default.</p> <p>For more information about enterprise project, see Enterprise Management User Guide.</p> <p>To customize an enterprise project, click Enterprise in the upper right corner of the console. The Enterprise Project Management Service page is displayed. For details, see Creating an Enterprise Project in <i>Enterprise Management User Guide</i>.</p>
Tags	<ul style="list-style-type: none"> - This setting is optional. Adding tags helps you better identify and manage your tasks. Each task can have up to 20 tags. - If your organization has configured tag policies for DRS, add tags to tasks based on the policies. If a tag does not comply with the policies, task creation may fail. Contact your organization administrator to learn more about tag policies. - After a task is created, you can view its tag details on the Tags tab. For details, see Tag Management.

 **NOTE**

If a task fails to be created, DRS retains the task for three days by default. After three days, the task automatically stops.

Step 3 After the replay instance is created, on the **Configure Source and Destination Databases** page, specify parameters in **Source Database**, **Destination Database**, and **Task Settings**. Then, click **Test Connection** for the destination database to check whether the destination database has been connected to the replay instance. After the connection test is successful, click **Next**.

- Source database information

Figure 3-13 Source database information

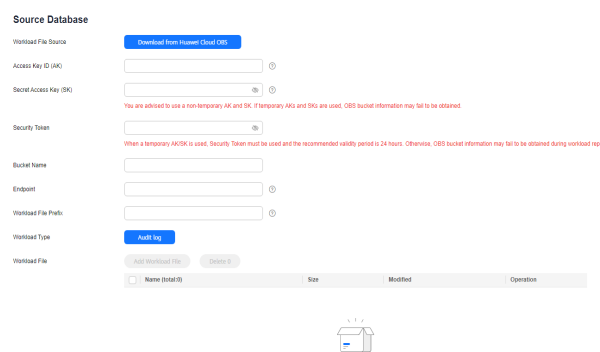


Table 3-17 Source database settings

Parameter	Description
Workload File Source	Specifies where the workload file in the source database is from.
Access Key ID (AK)	Access key ID, which is a unique identifier used in conjunction with a secret access key to sign requests cryptographically.
Secret Access Key (SK)	Used together with the access key ID to sign requests cryptographically. It identifies a request sender and prevents the request from being modified. Based on the principle of least permission, you can use temporary or permanent AKs/SKs. You are advised to use a temporary AK/SK .
Security Token	When a temporary AK/SK is used, Security Token must be used, and the recommended validity period is 24 hours. Otherwise, OBS bucket information may fail to be obtained during workload replay.
Bucket Name	Name of the OBS bucket for storing workload files.
Endpoint	OBS provides an endpoint for each region. An endpoint can be considered as the domain name of OBS in a region, and is used to process access requests from the region.
Workload File Prefix	Prefix of a file name in the OBS bucket. Only files whose names start with this prefix will be displayed.
Workload Type	Only Audit log is supported.
Workload File	Select the required workload file.

- Destination database information

Figure 3-14 Destination database information

Destination Database

DB Instance Name

Replay Connection IP Address

Database Username

Database Password

This button is available only after the replication instance is created successfully.

Table 3-18 Destination database settings

Parameter	Description
DB Instance Name	The GaussDB(for MySQL) instance you selected when creating the task. This parameter cannot be changed.
Replay Connection IP Address	The primary node IP address of a DB instance is selected by default, but if the instance has a proxy IP address, you can also select that address if needed.
Database Username	The username for accessing the destination database.
Database Password	The password for the database username.

 **NOTE**

The username and password of the destination database are encrypted and temporarily stored on the DRS instance host during the workload replay. After the task is deleted, the username and password are permanently deleted.

- Task Settings

Figure 3-15 Task settings

Task Settings

SQL Type: ▼

Replay Mode: Performance Transaction ?

Filter out SQLs: ?

 You can add 9 more SQLs.

Filter out SQLs Without Conditions: ▼ ?

Maximum Concurrent Connections: ?

Acceleration Configuration: ▼ ?

Table 3-19 Task settings

Parameter	Description
SQL Type	Select the SQL type to be replayed to the destination database. The default value is SELECT . The available options are SELECT , INSERT , UPDATE , DELETE , and DDL .

Parameter	Description
Replay Mode	You can select Performance or Transaction . <ul style="list-style-type: none">– In performance mode, you can set how many concurrent connections are allowed. SQL statements are replayed to the destination database based on a set number of connections. The SQL execution sequence in the source database may be different from that in the destination database. The replay performance is better.– In transaction mode, you cannot set how many concurrent connections are allowed. The number of connections is dynamically adjusted based on the connections in the source database logs to ensure that transaction SQL statements in the same connection of the source database are executed in sequence.
Filter out SQLs	The system fuzzily matches SQL statements based on the entered conditions, ignores case sensitivity, and filters SQL logs to be replayed to the destination database. The SQL logs that meet the conditions will be filtered out. You can configure up to 10 filtering rules.
Filter out SQLs Without Conditions	This option is used to filter out SQL statements of the SELECT, UPDATE, and DELETE types that do not contain conditions (that is, filter out SQL statements without a where condition).
Maximum Concurrent Connections	The number of replay threads configured for a workload replay task. The default value is 8 . The value ranges from 1 to 100 .
Acceleration Configuration	The percentage of the replayed SQLs to the SQLs executed on the source database within the same period. The percentage cannot exceed the maximum performance of the workload replay task. The value can be Unlimited , 100% , or 200% .

Step 4 On the **Check Task** page, check the replay task.

- If any check fails, review the cause and rectify the fault. After the fault is rectified, click **Check Again**.
- If all check items are successful, click **Next**.

Step 5 On the displayed page, specify **Start Time**, **Send Notification**, **SMN Topic**, and **Stop Abnormal Tasks After** and confirm that the configured information is correct and click **Submit** to submit the task.

Figure 3-16 Task startup settings

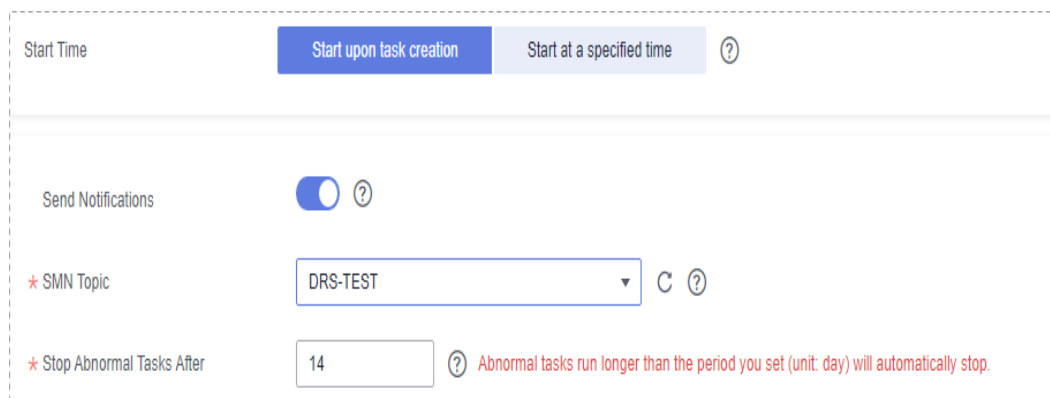



Table 3-20 Task startup settings

Parameter	Description
Start Time	Set Start Time to Start upon task creation or Start at a specified time based on site requirements. NOTE After a replay task is started, the performance of the source and destination databases may be affected. You are advised to start a replay task during off-peak hours.
Send Notifications	SMN topic. This parameter is optional. If an exception occurs during workload replay, the system will send a notification to the specified recipients.
SMN Topic	This parameter is available only after you enable Send Notifications and create a topic on the SMN console and add a subscriber. For details, see Simple Message Notification User Guide .
Stop Abnormal Tasks After	Number of days after which an abnormal task automatically stops. The value must range from 14 to 100. The default value is 14 . NOTE Tasks in the abnormal state are still charged. If tasks remain in the abnormal state for a long time, they cannot be resumed. Abnormal tasks running longer than the period you set (unit: day) will automatically stop to avoid unnecessary fees.

Step 6 After the task is submitted, view and [manage it](#) on the **Workload Replay Management** page.

- You can view the task status. For more information about task status, see [Task Statuses](#).
- You can click  in the upper right corner to view the latest task status.
- By default, DRS retains a task in the **Configuration** state for three days. After three days, DRS automatically deletes background resources, but the task

status remains unchanged. When you reconfigure the task, DRS applies for resources for the task again.

----End

4 Task Management

4.1 Creating a Workload Replay Task

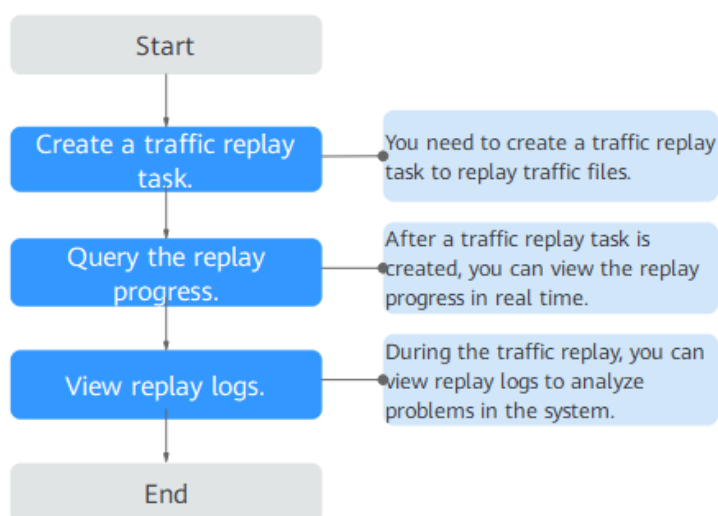
Scenarios

A workload replay task simulates the service load of the source database on the destination database so you can evaluate the effectiveness and performance of the destination database. This function applies to the following scenarios:

- Function testing: By creating a workload replay task, you can evaluate how the service load of the source database runs on the destination database.
- Peak load testing: By specifying the replay thread and speed, you can simulate the peak service load of the source database and analyze the stability of the destination database when workloads increase sharply.

Process

Figure 4-1 Workload replay process



- **Step 1: Create a workload replay task.** You can select the source database, workload file, and destination database as required to create a workload replay task.
- **Step 2: Query the replay progress.** During the workload replay, you can view the progress.
- **Step 3: View replay logs.** Workload replay logs contain alarms, errors, and prompt information. You can analyze replay problems based on such information.

This section describes how to create a workload replay task from RDS for MySQL to RDS for MySQL. To configure other storage engines, you can refer to the following procedures.

Procedure

Step 1 On the **Workload Replay Management** page, click **Create Workload Replay Task**.

Step 2 On the **Create Replay Instance** page, select a region and project, specify the task name, description, and the replay instance details, and click **Create Now**.

- Task information description

Figure 4-2 Workload replay task information

⚠ Only the task name and description can be modified. Other settings cannot be modified after you click Create Now on this page.
 The system will create virtual resources immediately after you click Create Now. Virtual resources cannot be modified after being created so no settings except the task name and description can be modified.

Region

Regions are geographic areas isolated from each other. For low network latency and quick resource access, select the nearest region.

Project

* Task Name

Description

0/256

Table 4-1 Task information

Parameter	Description
Region	The region where the replay instance is deployed. You can change the region.
Project	The project corresponds to the current region and can be changed.
Task Name	The task name must start with a letter and consist of 4 to 50 characters. It can contain only letters, digits, hyphens (-), and underscores (_).
Description	The description can contain up to 256 characters and cannot contain special characters !=<>&'\"

- Replay instance information

Figure 4-3 Replay instance information

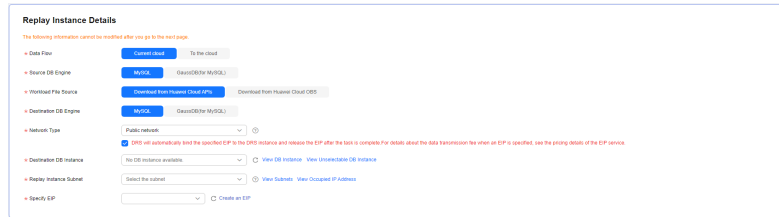


Table 4-2 Replay instance settings

Parameter	Description
Data Flow	Select Current cloud . <ul style="list-style-type: none"> – Current cloud refers to the workload replay scenario where both source and destination databases are Huawei Cloud DB instances. – To the cloud refers to the workload replay scenario where the destination database is a Huawei Cloud DB instance and data needs to be transferred.
Source DB Engine	Select MySQL .
Destination DB Engine	Select MySQL .
Network Type	Public network is used as an example. Available options: Public network, VPC, VPN or Direct Connect
Destination DB Instance	The RDS for MySQL DB instance you created. Ensure that baseline data has been developed in the destination database.
Replay Instance Subnet	Select the subnet where the replay instance is located. You can also click View Subnets to go to the network console to view the subnet where the instance resides. By default, the DRS instance and the destination DB instance are in the same subnet. You need to select the subnet where the DRS instance resides, and there are available IP addresses for the subnet. To ensure that the replay instance can be successfully created, only subnets with DHCP enabled are displayed.

Parameter	Description
Specify EIP	<p>This parameter is available when you select Public network for Network Type. Select an EIP to be bound to the DRS instance. DRS will automatically bind the specified EIP to the DRS instance and unbind the EIP after the task is complete.</p> <p>For details about the data transfer fee generated using a public network, see EIP Price Calculator.</p>

- AZ

Figure 4-4 AZ

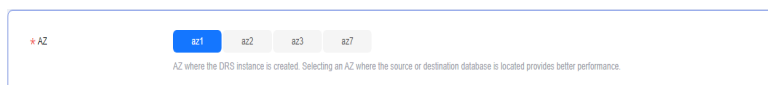


Table 4-3 Task AZ

Parameter	Description
AZ	Select the AZ where you want to create the DRS task. Selecting the one housing the source or destination database can provide better performance.

- Enterprise Project and Tags

Figure 4-5 Enterprise Project and Tags

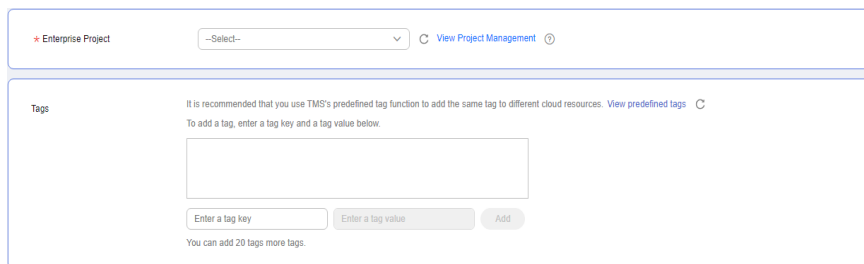


Table 4-4 Enterprise Project and Tags

Parameter	Description
Enterprise Project	<p>An enterprise project you would like to use to centrally manage your cloud resources and members. Select an enterprise project from the drop-down list. The default project is default.</p> <p>For more information about enterprise project, see Enterprise Management User Guide.</p> <p>To customize an enterprise project, click Enterprise in the upper right corner of the console. The Enterprise Project Management Service page is displayed. For details, see Creating an Enterprise Project in <i>Enterprise Management User Guide</i>.</p>
Tags	<ul style="list-style-type: none"> - This setting is optional. Adding tags helps you better identify and manage your tasks. Each task can have up to 20 tags. - If your organization has configured tag policies for DRS, add tags to tasks based on the policies. If a tag does not comply with the policies, task creation may fail. Contact your organization administrator to learn more about tag policies. - After a task is created, you can view its tag details on the Tags tab. For details, see Tag Management.

 **NOTE**

If a task fails to be created, DRS retains the task for three days by default. After three days, the task automatically stops.

Step 3 After the replay instance is created, on the **Configure Source and Destination Databases** page, specify parameters in **Source Database**, **Destination Database**, and **Task Settings**. Then, click **Test Connection** for the destination database to check whether the destination database has been connected to the replay instance. After the connection test is successful, click **Next**.

- Source database information

Figure 4-6 Source database information

Source Database

Workload File Source [Download from Huawei Cloud APIs](#)

DB Instance Name [View DB Instance](#) [View Unselectable DB Instance](#)

Workload Type [Audit log](#)


Time Range 

Table 4-5 Source database settings

Parameter	Description
Workload File Source	Specifies where the workload file in the source database is from.
DB Instance Name	Select an RDS for MySQL DB instance for which SQL workload files have been recorded. For details about how to record SQL workload files, see Enabling SQL Audit .
Workload Type	Only Audit log is supported.
Time Range	Select the time range for audit logs.

- Destination database information

Figure 4-7 Destination database information

Destination Database

DB Instance Name

Database Username

Database Password

SSL Connection

Table 4-6 Destination database settings

Parameter	Description
DB Instance Name	The RDS DB instance you selected when creating the task. This parameter cannot be changed.
Database Username	The username for accessing the destination database.
Database Password	The password for the database username.
SSL Connection	<p>If SSL connection is required, enable SSL on the destination database, ensure that related parameters have been correctly configured, and upload an SSL certificate.</p> <p>NOTE</p> <ul style="list-style-type: none"> - The maximum size of a single certificate file that can be uploaded is 500 KB. - If SSL is disabled, your data may be at risk.

 **NOTE**

The username and password of the destination database are encrypted and temporarily stored on the DRS instance host during the workload replay. After the task is deleted, the username and password are permanently deleted.

- Task Settings

Figure 4-8 Task settings

Task Settings

SQL Type:

Replay Mode: Performance Transaction ?

Filter out SQLs: ?
Add
 You can add 9 more SQLs.

Filter out SQLs Without Conditions: ?

Maximum Concurrent Connections: ?

Acceleration Configuration: ?

Table 4-7 Task settings

Parameter	Description
SQL Type	Select the SQL type to be replayed to the destination database. The default value is SELECT . The available options are SELECT , INSERT , UPDATE , DELETE , and DDL .
Replay Mode	You can select Performance or Transaction . <ul style="list-style-type: none"> – In performance mode, you can set how many concurrent connections are allowed. SQL statements are replayed to the destination database based on a set number of connections. The SQL execution sequence in the source database may be different from that in the destination database. The replay performance is better. – In transaction mode, you cannot set how many concurrent connections are allowed. The number of connections is dynamically adjusted based on the connections in the source database logs to ensure that transaction SQL statements in the same connection of the source database are executed in sequence.
Filter out SQLs	The system fuzzily matches SQL statements based on the entered conditions, ignores case sensitivity, and filters SQL logs to be replayed to the destination database. The SQL logs that meet the conditions will be filtered out. You can configure up to 10 filtering rules.

Parameter	Description
Filter out SQLs Without Conditions	This option is used to filter out SQL statements of the SELECT, UPDATE, and DELETE types that do not contain conditions (that is, filter out SQL statements without a where condition).
Maximum Concurrent Connections	The number of replay threads configured for a workload replay task. The default value is 8 . The value ranges from 1 to 100 .
Acceleration Configuration	The percentage of the replayed SQLs to the SQLs executed on the source database within the same period. The percentage cannot exceed the maximum performance of the workload replay task. The value can be Unlimited , 100% , or 200% .

Step 4 On the **Check Task** page, check the replay task.

- If any check fails, review the cause and rectify the fault. After the fault is rectified, click **Check Again**.
- If all check items are successful, click **Next**.

Step 5 On the displayed page, specify **Start Time**, **Send Notification**, **SMN Topic**, and **Stop Abnormal Tasks After** and confirm that the configured information is correct and click **Submit** to submit the task.

Figure 4-9 Task startup settings

The screenshot shows the task startup settings interface. It includes the following elements:


- Start Time:** A radio button group with two options: "Start upon task creation" (selected) and "Start at a specified time".
- Send Notifications:** A toggle switch that is currently turned on.
- SMN Topic:** A dropdown menu with a refresh icon and a help icon.
- Stop Abnormal Tasks After:** A text input field containing the value "14", followed by a help icon and a red warning message: "Abnormal tasks run longer than the period you set (unit: day) will automatically stop."

Table 4-8 Task startup settings

Parameter	Description
Start Time	Set Start Time to Start upon task creation or Start at a specified time based on site requirements. NOTE After a replay task is started, the performance of the source and destination databases may be affected. You are advised to start a replay task during off-peak hours.

Parameter	Description
Send Notifications	SMN topic. This parameter is optional. If an exception occurs during workload replay, the system will send a notification to the specified recipients.
SMN Topic	This parameter is available only after you enable Send Notifications and create a topic on the SMN console and add a subscriber. For details, see Simple Message Notification User Guide .
Stop Abnormal Tasks After	Number of days after which an abnormal task automatically stops. The value must range from 14 to 100. The default value is 14 . NOTE Tasks in the abnormal state are still charged. If tasks remain in the abnormal state for a long time, they cannot be resumed. Abnormal tasks running longer than the period you set (unit: day) will automatically stop to avoid unnecessary fees.

Step 6 After the task is submitted, view and [manage it](#) on the **Workload Replay Management** page.

- You can view the task status. For more information about task status, see [Task Statuses](#).
- You can click  in the upper right corner to view the latest task status.
- By default, DRS retains a task in the **Configuration** state for three days. After three days, DRS automatically deletes background resources, but the task status remains unchanged. When you reconfigure the task, DRS applies for resources for the task again.

----End

4.2 Querying the Replay Progress

The replay progress displays the SQL execution status during workload replay, helping you learn about the task status.

Prerequisites

- You have logged in to the DRS console.
- A workload replay task has been started.

Querying the Replay Progress

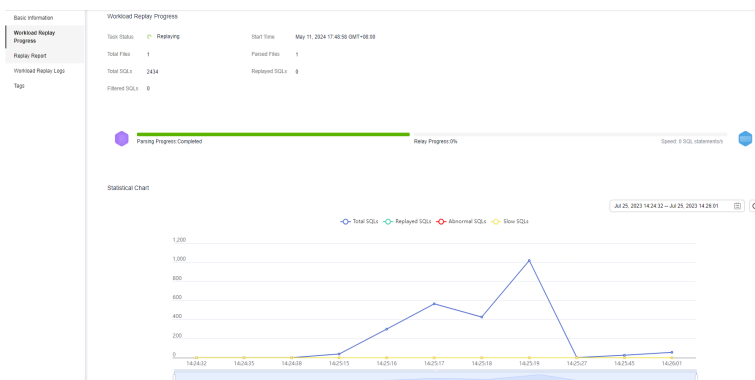
Step 1 On the **Workload Replay Management** page, click the target replay task in the **Task Name/ID** column.

Step 2 On the displayed page, click **Workload Replay Progress** to view task progress.

- In the **Workload Replay Progress** area, you can view the task status, start time, total number of SQL statements, and number of replayed SQL statements.

- In the **Statistics Chart** area, you can view the total number of SQL statements, number of replayed SQL statements, number of abnormal SQL statements, and number of slow SQL statements in a specified period.
- In the **Abnormal SQLs in Workload Replay** area, you can view the SQL statements that fail to be replayed.
- In the **Slow SQLs** area, you can view the original time and replay time required for executing a SQL statement.
- In the **SQL Execution Progress** area, you can view the SQL statements that are executing in the destination database during replay.

Figure 4-10 Workload replay progress



----End

Downloading an Exported Report

Abnormal and slow SQL statements can be exported and download during workload replay.


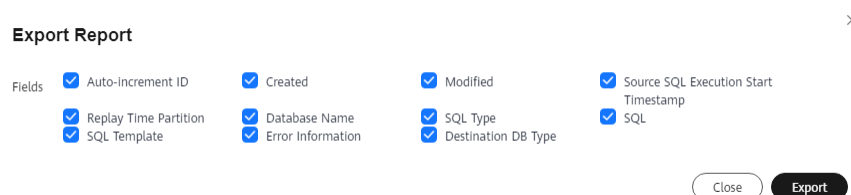
- Step 1** On the **Workload Replay Management** page, click the target replay task in the **Task Name/ID** column.
- Step 2** On the displayed page, click **Workload Replay Progress** to view task progress.
- Step 3** In the **Abnormal SQLs in Workload Replay** and **Slow SQLs** areas on the **Workload Replay Progress** page, download reports for the task.
 1. Click  on the right of the **Abnormal SQLs in Workload Replay** or **Slow SQLs** area to export the report.
 2. In the displayed dialog box, select the fields to be exported and click **Export**.

Figure 4-11 Exporting a report




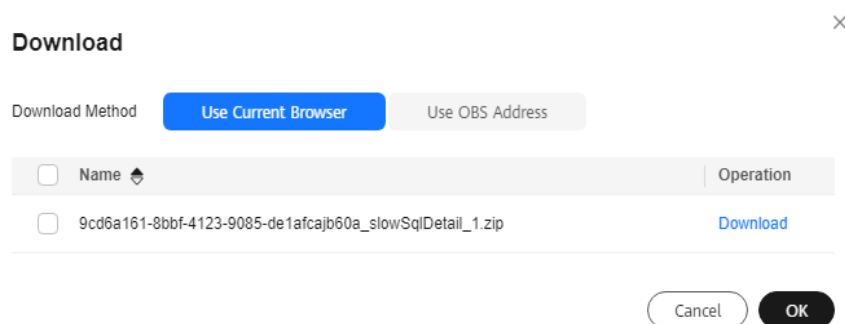
3. After the export is complete, click  to download the report.

Figure 4-12 Downloading a report

----End

4.3 Viewing the Replay Reporting

The replay reporting records the execution time curve of each SQL statement replayed in the destination database, number of replayed SQLs, and replay duration.

Prerequisites

You have logged in to the DRS console.

Viewing the Replay Reporting

- Step 1** On the **Workload Replay Management** page, click the target replay task in the **Task Name/ID** column.
- Step 2** On the **Replay Reporting** page, view the report information about the current task.
 - In the **Statistics Chart** area, you can view the total number of SQL statements, number of replayed SQL statements, number of abnormal SQL statements, and number of slow SQL statements replayed in the destination database in a specified period.

Figure 4-13 Replay statistics chart

- In the **Slow SQLs** area, you can view the number of SQL statements of each type and the replay duration.

- In the **Abnormal SQLs in Workload Replay** area, you can view the number of SQL statements that fail to be replayed.

Figure 4-14 SQLs to be replayed

The screenshot shows two tables. The first table, 'Slow SQLs', lists various SQL statements with their counts, maximum durations, and average durations. The second table, 'Abnormal SQLs in Traffic Replay', lists SQL statements that failed to be replayed, including their object types and values.

SQL Type	SQL Template	SQL Template ID	Maximum Duration(ms)	Average Duration(ms)
DQL	SHOW VARIABLES LIKE ?	182	74	16
DQL	SHOW GLOBAL VARIABLES LIKE ?	11	9	6
DQL	SHOW GLOBAL STATUS LIKE ?	1	4	4
DQL	SHOW BINARY LOGS	7	54	36
DQL	SHOW GLOBAL STATUS WHERE variable_name IN (?)	6	23	12
SELECT	SELECT * FROM information_schema.processlist WHERE K99 IS NOT NULL O.	2	14	9
UPDATE	UPDATE mysql.status_history SET heartbeat = NOW()	14	40	15

Object Type	Value	SQL Template ID
DQL	SET SESSION sql_log_bin=OFF	215
DQL	SET SESSION sql_log_bin=ON	2
SELECT	SELECT * FROM mysql.innodb	2
SELECT	SELECT COUNT(*) FROM mysql.table WHERE column_x = ? AND rank = ?	2

----End

Downloading a Replay Report

Step 1 On the **Workload Replay Management** page, click the target replay task in the **Task Name/ID** column.

Step 2 On the **Replay Reporting** page, download the replay report of the current task.



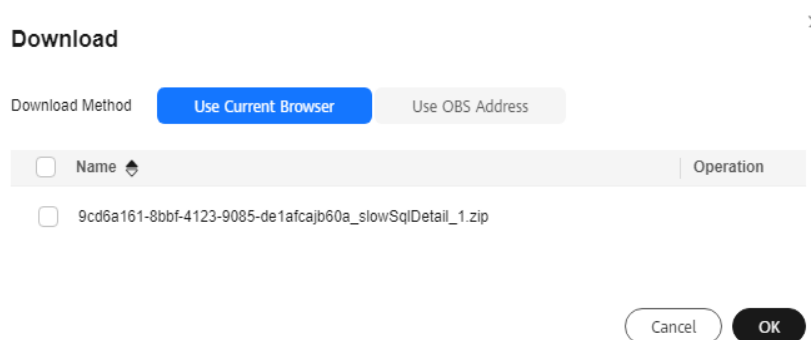
1. Click  on the right of the **Slow SQLs** or **Abnormal SQLs in Workload Replay** area to export the report.
2. After the export is complete, click  to download the report.

Figure 4-15 Downloading a report



----End

4.4 Viewing Replay Logs

Replay logs refer to the warning-, error-, and info-level logs generated during the workload replay. This section describes how to view replay logs to locate and analyze database problems.

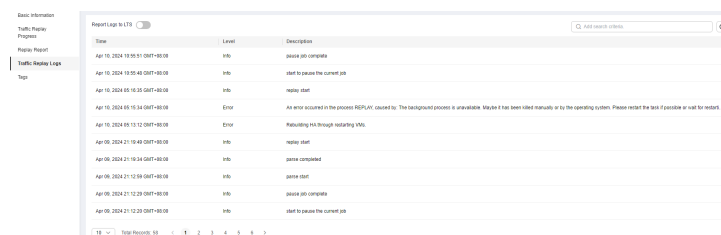
Prerequisites

You have logged in to the DRS console.

Procedure

- Step 1** On the **Workload Replay Management** page, click the target replay task in the **Task Name/ID** column.
- Step 2** On the displayed page, click **Workload Replay Logs** to view the logs generated during the workload replay.

Figure 4-16 Viewing replay logs



Time	Level	Description
Apr 10, 2024 18:25:51 GMT+08:00	Info	backup job complete
Apr 10, 2024 18:25:40 GMT+08:00	Info	start to pause the current job
Apr 10, 2024 09:10:20 GMT+08:00	Info	restore start
Apr 10, 2024 09:10:14 GMT+08:00	Error	An error occurred in the process RSPUVC caused by: The background process is unavailable. Maybe it has been killed manually or by the operating system. Please check the task (possible or not) for restore.
Apr 10, 2024 09:13:12 GMT+08:00	Error	Rebuilding DM through restoring XMS.
Apr 10, 2024 21:19:44 GMT+08:00	Info	restore start
Apr 10, 2024 21:19:34 GMT+08:00	Info	restore completed
Apr 10, 2024 21:12:58 GMT+08:00	Info	restore start
Apr 10, 2024 21:12:20 GMT+08:00	Info	restore job complete
Apr 10, 2024 21:12:20 GMT+08:00	Info	start to pause the current job

In addition, DRS can interconnect with Log Tank Service (LTS). After you enable log reporting to LTS, all logs generated by DRS instances will be uploaded to LTS for management. For details, see [Log Reporting](#).

----End

4.5 Task Life Cycle

4.5.1 Viewing Task Details

After a workload replay task is created and started, you can view the configuration information about the task on the **Basic Information** page. The configuration information includes the task information, connection information, object information, and replay control.

Prerequisites

You have logged in to the DRS console.

Procedure

NOTE

In the task list, only tasks created by the current login user are displayed. Tasks created by different users of the same tenant are not displayed.

- Step 1** On the **Workload Replay Management** page, click the target replay task in the **Task Name/ID** column.

Step 2 On the displayed **Basic Information** tab, view details about the replay task.

You can view the task information, connection information, object information, replay control, and notification settings of the current replay task.

----End

4.5.2 Modifying Task Information

After a workload replay task is created, you can modify task information to identify different tasks.

The following task information can be edited:

- Task name
- Description
- SMN topic
- Number of days when an abnormal task is stopped
- Task start time

Prerequisites

You have logged in to the DRS console.

Procedure

Step 1 On the **Workload Replay Management** page, click the target replay task in the **Task Name/ID** column.

Step 2 On the **Basic Information** tab, locate the information to be modified in the **Task Information** area and **Notification Settings** area.




- You can click  to modify the task name, SMN topic, the time to stop abnormal tasks, and description.
 - To submit the change, click .
 - To cancel the change, click .

Table 4-9 Workload replay task information

Task Information	Description
Task Name	The task name must start with a letter and consist of 4 to 50 characters. It can contain only letters, digits, hyphens (-), and underscores (_).
Description	The description consists of a maximum of 256 characters and cannot contain special characters ! <>&'\"
SMN Topic	You can apply for a topic on the SMN console and add a subscription. For details, see Simple Message Notification User Guide .

Task Information	Description
Stop Abnormal Tasks After	The value must range from 14 to 100. The default value is 14.

- You can modify the task start time only when the task is in the **Pending start** status.

In the **Task Information** area, click **Modify** in the **Scheduled Start Time** field. On the displayed page, specify the scheduled start time and click **OK**.

Step 3 View the change result on the **Basic Information** tab.

----End

4.5.3 Editing a Replay Task

For a replay task that has been created but not started, DRS allows you to edit the configuration information of the task. For replay tasks in the following statuses, you can edit and submit the tasks again.

- Creating
- Configuration
- Paused
- Replay completed

NOTE

For a paused or completed task, you can use the editing function to add a workload file and modify the task configuration.

Prerequisites

You have logged in to the DRS console.

Procedure

- Step 1** In the task list on the **Workload Replay Management** page, locate the target task and click **Edit** in the **Operation** column.
- Step 2** On the **Configure Source and Destination Databases** page, enter information about the source and destination databases and task settings, and click **Next**.
- Step 3** On the **Confirm Task** page, specify **Start Time**, confirm that the configured information is correct and click **Submit** to submit the task.
- Step 4** After the task is submitted, view and manage it on the **Workload Replay Management** page.

----End

4.5.4 Pausing a Replay Task

DRS allows you to pause workload replay tasks.

Prerequisites

- You have logged in to the DRS console.

Pausing a Task

Step 1 In the task list on the **Workload Replay Management** page, locate the target task and click **Pause** in the **Operation** column.

Step 2 In the displayed **Pause Task** dialog box, click **Yes**.

NOTE

After the task is paused, the status of the task becomes **Paused**.

----End

4.5.5 Resuming a Replay Task

A fault may occur during the workload replay due to external factors. After the fault is rectified based on the replay log information, you can resume the replay.

You can resume replay tasks in any of the following statuses:

- Failed
- Paused

NOTE

- If a replay task fails due to non-network problems, the system will automatically resume the task three times by default. If the failure persists, you can resume the task manually.
- If a replay task fails due to network problems, the system will automatically resume the task until the replay is restored.

Prerequisites

You have logged in to the DRS console.

Procedure

Step 1 In the task list on the **Workload Replay Management** page, locate the target task and click **Resume** in the **Operation** column.

Step 2 In the displayed **Resume Task** dialog box, confirm the task information and click **Yes** to submit the replay task again.

----End

4.5.6 Resetting a Replay Task

During workload replay, you can reset the replay tasks in one of the following statuses so that you do not need to configure the tasks again.

- Paused
- Replay completed

 NOTE

You can select **Parse and Reset** as required. Resetting a replay task will not clear the data in the destination database.

Prerequisites

You have logged in to the DRS console.

Procedure

- Step 1** In the task list on the **Workload Replay Management** page, locate the target task and click **Reset** in the **Operation** column.
- Step 2** In the displayed **Reset Task** dialog box, select a reset method.
 - If you deselect **Parse and Reset**, after the task is reset, the workload file will not be parsed again. The existing parsed workload is replayed on the destination database.
 - If you select **Parse and Reset**, after the task is reset, all content obtained by parsing the workload file is cleared, the workload file is parsed again, and the new parsed workload is replayed on the destination database.
- Step 3** After the pre-check is passed, click **Start** to reset the task.

----End

4.5.7 Stopping a Replay Task

After the workload replay is complete, you can stop the replay task. You can stop a task in any of the following statuses:

- Creating
- Configuration
- Pending start
- Starting
- Start failed
- Parsing
- Replaying
- Replay failed
- Replay completed

NOTICE

- For a task in the **Configuration** state, it cannot be stopped if it fails to be configured.
 - After a task is stopped, it cannot be retried.
-

Procedure

Step 1 In the task list on the **Workload Replay Management** page, locate the target task and click **Stop** in the **Operation** column.

Step 2 In the displayed dialog box, click **OK**.

----End

4.5.8 Deleting a Replay Task

This section describes how to delete a replay task that has been completed or has failed. Deleted tasks will no longer be displayed in the task list. Exercise caution when performing this operation.

Prerequisites

You have logged in to the DRS console.

Deleting a Task

Step 1 In the task list on the **Workload Replay Management** page, locate the target task and click **Delete** in the **Operation** column.

Step 2 Click **Yes**.

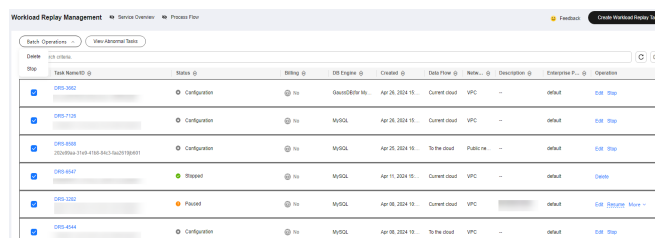
----End

Deleting Tasks

Step 1 On the **Workload Replay Management** page, select the tasks to be deleted.

Step 2 Click **Batch Operations** in the upper left corner and choose **Delete**.

Figure 4-17 Batch Operations



Task Name	Status	Setting	DB Engine	Created	Data Flow	Network	Description	Database	Operation
DRS-3002	Configuration	no	Oracle@19c	Apr 26, 2024 15:...	Current cloud	VPC	--	default	DR Stop
DRS-7120	Configuration	no	MySQL	Apr 26, 2024 15:...	Current cloud	VPC	--	default	DR Stop
DRS-8268	Configuration	no	MySQL	Apr 26, 2024 15:...	To the cloud	Public net	--	default	DR Stop
DRS-8647	Shipped	no	MySQL	Apr 15, 2024 15:...	Current cloud	VPC	--	default	DR Stop
DRS-1202	Failed	no	MySQL	Apr 26, 2024 15:...	Current cloud	VPC	--	default	DR Stop, More
DRS-4244	Configuration	no	MySQL	Apr 26, 2024 15:...	To the cloud	VPC	--	default	DR Stop

Step 3 In the displayed dialog box, confirm the task information and click **Yes**.

----End

4.5.9 Task Statuses

Replay statuses indicate different replay phases.

Table 4-10 lists replay task statuses and descriptions.

Table 4-10 Task status description

Status	Description
Creating	The replay instance is being created for DRS.
Configuration	The replay instance is successfully created, but the synchronization task is not started. You can continue to configure the task.
Pending start	The scheduled replay task has been delivered to the replay instance, waiting for the replay instance to start the replay task.
Starting	The replay task is being started.
Start failed	The workload replay task fails to be started.
Parsing	The workload file is being parsed.
Replaying	Workload replay is in progress.
Replay failed	Workload data fails to be replayed to the destination database.
Replay completed	All SQL statements in the selected workload file have been replayed to the destination database.
Task stopping	The replay instance and resources are being released.
Stopping task failed	The replay instance and resources fail to be released.
Completed	The replay instance is released successfully.

NOTE

- If a task fails to be created, DRS retains the task for three days by default. After three days, the task automatically stops.
- By default, DRS retains a task in the **Configuration** state for three days. After three days, DRS automatically deletes background resources, but the task status remains unchanged. When you reconfigure the task, DRS applies for resources for the task again.
- Deleted replay tasks are not displayed in the status list.
- For a completed task, you can use the editing function to add a workload file, modify the task configuration, and replay the task again.

5 Tag Management

Scenarios

Tag Management Service (TMS) enables you to use tags on the management console to manage resources. TMS works with other cloud services to manage tags. TMS manages tags globally, and other cloud services manage their own tags. If you have to manage a large number of tasks, you can use different tags to identify and search for tasks.

- You are advised to set predefined tags on the TMS console.
- A tag consists of a key and value. You can add only one value for each key.
- Each DB instance can have up to 20 tags.


Adding a Tag

Step 1 On the **Workload Replay Management** page, click the target replay task in the **Task Name/ID** column.

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

Step 3 On the **Tags** tab, click **Add/Edit Tags**. In the displayed dialog box, enter a tag key and value, click **Add**, and click **OK**.

Add/Edit Tags ✕

It is recommended that you use TMS's predefined tag function to add the same tag to different cloud resources. [View predefined tags](#) 

To add a tag, enter a tag key and a tag value below.

You can add 20 tags more tags.

- When you enter a tag key and value, the system automatically displays all tags (including predefined tags and resource tags) associated with all DB instances except the current one.
- The tag key must be unique. It must consist of 1 to 128 characters and can include letters, digits, spaces, and the following characters: `._:=-+@`. It cannot start or end with a space, or start with `_sys_`.
- The tag value can be empty. It cannot start or end with a space and can contain 0 to 255 characters, including letters, digits, spaces, and special characters `._:/=-+@`.

Step 4 View and manage the tag on the **Tags** page.

----End

Editing a Tag

Step 1 On the **Workload Replay Management** page, click the target replay task in the **Task Name/ID** column.

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

Step 3 On the **Tags** page, click **Add/Edit Tags**. In the displayed dialog box, modify the tag and click **OK**.

----End

Delete a Tag

Step 1 On the **Workload Replay Management** page, click the target replay task in the **Task Name/ID** column.

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

Step 3 On the **Tags** page, locate the tag to be deleted and click **Delete** in the **Operation** column. In the displayed dialog box, click **Yes**.

Step 4 After the tag is deleted, it will no longer be displayed on the **Tags** page.

----End

6 Connection Diagnosis

If a DRS instance fails to be connected to the destination database during connection testing, DRS provides the quick diagnosis function and returns the diagnosis result.

- You can perform connection diagnosis only on the task node whose database information is obtained by entering an IP address or selecting a task node on the GUI.

Prerequisites

- You have logged in to the DRS console.
- A task has been created.

Procedure

Step 1 On the task management page, click the target task name in the **Task Name/ID** column.

Step 2 On the **Configure Source and Destination Databases** page, specify the destination database information and click **Test Connection** for the destination database to check whether the destination database has been connected to the DRS instance.

If the connection testing fails, click **Quick Diagnosis** on the right of the failure information to diagnose the fault.

Figure 6-1 Quick Diagnosis

Destination Database

DB Instance Name

Database Username

Database Password

SSL Connection

● The network connection between the replication instance and database is faulty., [View details](#)

Step 3 View the diagnosis result on the displayed **Diagnosis Details** dialog box. The result includes the packet loss rate and port check result.

Figure 6-2 Diagnosis Details



----End

7 Interconnecting with LTS

7.1 Log Reporting

Scenarios

If you enable log reporting, all logs generated by DRS instances (including real-time migration, backup migration, real-time synchronization, real-time disaster recovery, and workload replay instances) are uploaded to Log Tank Service (LTS) for management.

Precautions

- After this function is enabled, all logs of the task are reported by default.
- This request does not take effect immediately. There is a delay of about 10 minutes.
- You will be billed for this function. For details, see [LTS Pricing Details](#).
- Ensure that there are available LTS log groups and log streams in the same region as your instance.

For more information about log groups and log streams, see [Log Management](#).

- After this function is disabled, you will not be billed anymore.

Enabling or Disabling Log Reporting

Step 1 Log in to the management console.

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

Step 3 Choose **Database > Data Replication Service**. The **Data Replication Service** page is displayed.

Step 4 Take real-time migration as an example. On the **Online Migration Management** page, click the target migration task name in the **Task Name/ID** column. The operations for real-time synchronization, real-time disaster recovery, and workload replay are similar to those for real-time migration.

Step 5 On the **Basic Information** page, click **Migration Logs** on the left.

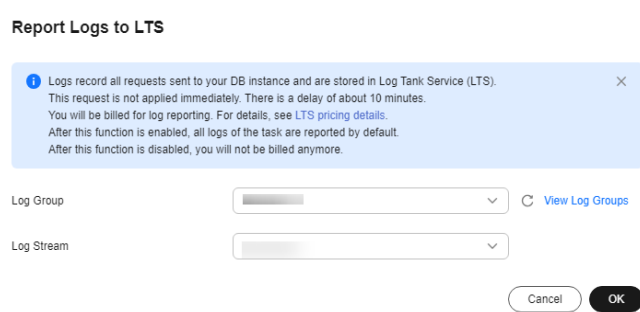
Step 6 Click  next to **Report Logs to LTS** in the upper part of the page.

Step 7 Select an LTS log group and log stream and click **OK**.

 **NOTE**

This request does not take effect immediately. There is a delay of about 10 minutes.

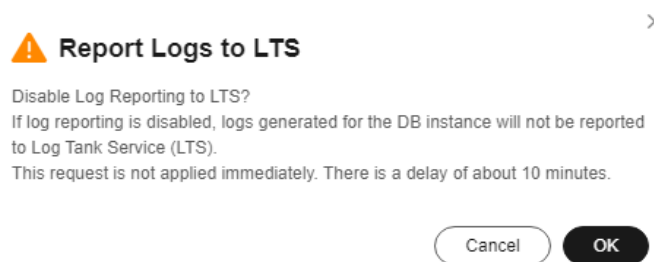
Figure 7-1 Enabling audit log reporting to LTS



Step 8 To disable or modify log reporting, click the toggle switch next to **Report Logs to LTS** or click **Edit** next to the **Report Logs to LTS** toggle switch.

- Modifying log reporting: Click **Edit** next to the **Report Logs to LTS** toggle switch. In the displayed dialog box, select the LTS log group and log stream again and click **OK**.
- Disabling log reporting: Click the toggle switch next to **Report Logs to LTS**. In the displayed dialog box, click **OK**.

Figure 7-2 Disabling log reporting to LTS



----End

7.2 Viewing and Downloading Logs

Scenarios

If you have enabled log reporting to LTS for a DRS task in **Log Reporting**, you can analyze logs, search for logs, visualize logs, download logs, and view real-time logs on the LTS console.

Viewing Logs Reported to LTS


- Step 1** Log in to the management console.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Under **Management & Governance**, click **Log Tank Service**.
- Step 4** In the **Log Groups** area, locate a target log group and click its name. For details about LTS, see [Log Tank Service User Guide](#).

Figure 7-3 Viewing log details

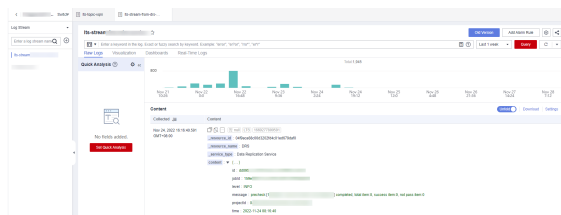


Table 7-1 Log field description

Name	Type	Description
_resource_id	String	Resource ID. The value is fixed to projectId for DRS.
_resource_name	String	Resource name. The value is fixed to DRS .
_service_type	String	Service type. The value is fixed to Data Replication Service .

----End

Downloading Logs Reported to LTS


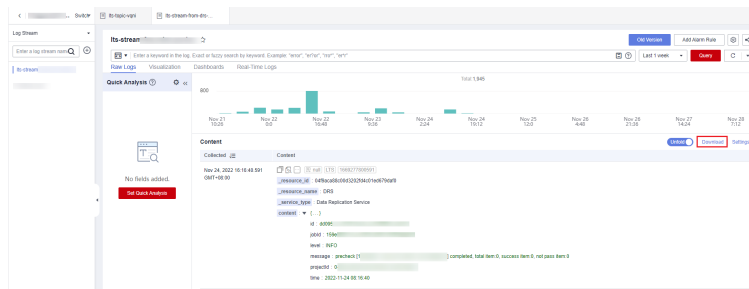
- Step 1** Log in to the management console.
- Step 2** Click  in the upper left corner and select a region and project.
- Step 3** Under **Management & Governance**, click **Log Tank Service**.
- Step 4** In the **Log Groups** area, locate a target log group and click its name.
- Step 5** Click **Download** on the right to download logs. For details about LTS, see [Log Tank Service User Guide](#).

Figure 7-4 Downloading logs



-----End

8 Audit Log Format

When creating a DRS workload replay task, you can select different sources for the source DB engine. The audit log format varies depending on the source database.

Table 8-1 Parameters of audit logs

Parameter	Description
quo	Enclosing character. Generally, SQL statements in audit logs are enclosed by this character.
column	Total number of columns in each row.
separator	Separator of audit logs.
format	Meaning of a key column. The value starts from 0.
timeFormat	Date format. If this parameter is left empty, it indicates the timestamp.

Huawei Cloud RDS for MySQL

```
quo ="  
column = 12  
separator = ,  
format = threadId:1,protocolType:3,time:4,queryType:5,sql:6,client:10  
timeFormat = yyyy-MM-dd'T'HH:mm:ss 'UTC'
```

Huawei Cloud GaussDB(for MySQL)

```
quo =^^  
column = 19  
separator = ,  
format = threadId:4,latency:12,protocolType:0,time:2,queryType:3,sql:6,client:10,schemaName:11,client2:8  
timeFormat =
```

Alibaba Cloud ApsaraDB RDS for MySQL

```
quo ="  
column = 16  
separator = ,  
format = threadId:2,latency:8,time:10,queryType:5,sql:0,client:4,schemaName:1  
timeFormat =
```

Alibaba Cloud PolarDB for MySQL

```
quo ="  
separator=  
column = 12  
format = threadId:2,latency:8,time:11,queryType:5,sql:0,client:4,schemaName:1  
timeFormat =
```

Tencent Cloud TDSQL-C for MySQL

```
quo ="  
separator=  
column = 20  
format = threadId:15,latency:9,time:18,queryType:2,sql:6,client:7,schemaName:5  
timeFormat = yyyy-MM-dd HH:mm:ss
```

Amazon Aurora MySQL

```
quo ='  
column = 10  
separator = ,  
format = threadId:4,time:0,sql:8,client:3,schemaName:7  
timeFormat = yyyy-MM-dd'T'HH:mm:ss.SSS'Z'
```

Self-Managed MySQL

```
quo =  
separator =\t  
column = 3  
format = time:0,threadIdAndProtocolType:1,sql:2  
//MySQL 5.7 or later  
timeFormat = yyyy-MM-dd'T'HH:mm:ss.SSSSSS'Z'  
//MySQL 5.5 and 5.6  
timeFormat = yyMMdd HH:mm:ss
```

MariaDB

```
quo ='  
separator=  
column = 10  
format = threadId:4,time:0,protocolType:6,sql:8,client:3,schemaName:7  
timeFormat = yyyyMMdd HH:mm:ss
```

A Change History

Released On	Description
2024-03-30	<p>This issue is the fourth official release, which incorporates the following changes:</p> <ul style="list-style-type: none">• Supported the display of workload replay progress in percentage.• Added the need for manually specifying an EIP for a DRS task over public network.
2024-02-28	<p>This issue is the third official release, which incorporates the following change:</p> <ul style="list-style-type: none">• Supported self-managed MySQL for Source DB From for a workload replay task from MySQL to the cloud.
2023-10-30	<p>This issue is the second official release, which incorporates the following change:</p> <ul style="list-style-type: none">• Added support for downloading the replay report for a DRS workload replay task.
2023-09-30	<p>This issue is the first official release.</p> <ul style="list-style-type: none">• Added support for workload replay from MySQL to MySQL, MySQL to GaussDB(for MySQL), and GaussDB(for MySQL) to GaussDB(for MySQL).