

Alibaba Cloud HybridDB for MySQL

User Guide

Issue: 20181218

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Generic conventions

Table -1: Style conventions

Style	Description	Example
	This warning information indicates a situation that will cause major system changes, faults, physical injuries, and other adverse results.	 Danger: Resetting will result in the loss of user configuration data.
	This warning information indicates a situation that may cause major system changes, faults, physical injuries, and other adverse results.	 Warning: Restarting will cause business interruption. About 10 minutes are required to restore business.
	This indicates warning information, supplementary instructions, and other content that the user must understand.	 Note: Take the necessary precautions to save exported data containing sensitive information.
	This indicates supplemental instructions, best practices, tips, and other content that is good to know for the user.	 Note: You can use Ctrl + A to select all files.
>	Multi-level menu cascade.	Settings > Network > Set network type
Bold	It is used for buttons, menus, page names, and other UI elements.	Click OK .
Courier font	It is used for commands.	Run the <code>cd /d C:/windows</code> command to enter the Windows system folder.
<i>Italics</i>	It is used for parameters and variables.	<code>bae log list --instanceid Instance_ID</code>
[] or [a b]	It indicates that it is a optional value, and only one item can be selected.	<code>ipconfig [-all -t]</code>
{ } or {a b}	It indicates that it is a required value, and only one item can be selected.	<code>swich {stand slave}</code>

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1 Preface

Overview

HybridDB for MySQL is a distributed hybrid transaction/analytical processing (HTAP) database.

This database has the following features:

- Supports both online transaction processing (OLTP) and online analytical processing (OLAP), and allows for real-time analysis and decision making.
- Supports online expansion in the distributed multi-node architecture.
- Provides PB-level storage, and supports data compression.
- Fully compatible with MySQL syntax and functions, and supports common Oracle analysis functions.
- Fully supports the TPC-H and TPC-DS testing benchmarks.

This document describes how to set HybridDB for MySQL using the [HybridDB for MySQL console](#), and provides more information about the benefits and features of HybridDB for MySQL. You can also manage the HybridDB for MySQL console using APIs.

To contact Technical Support, click **Ticket System > Open Ticket** in the [HybridDB for MySQL console](#) or click [Here](#) to submit a ticket.

For more information about features and pricing of HybridDB for MySQL, see [HybridDB for MySQL details page](#).

Declaration

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Basic concepts

- Instance: a separate database service process that occupies physical memory.
- Database: a logical unit that is created under an instance. Only one database can be created for one HybridDB for MySQL instance.

2 Quick start

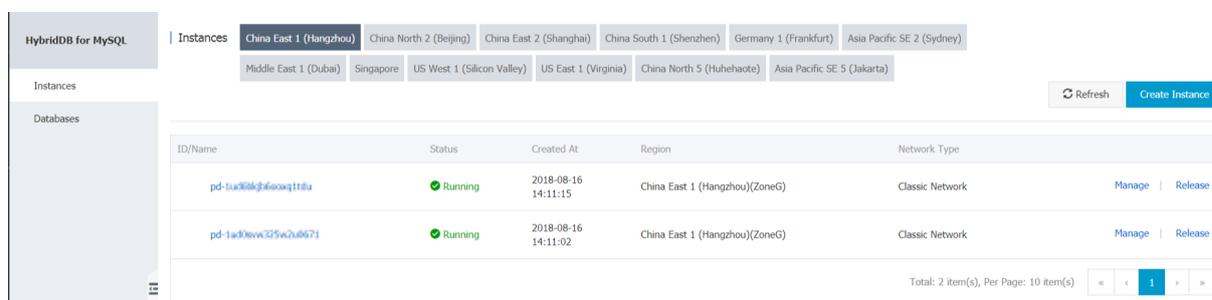
For more information about common operations in HybridBD for MySQL, see [Quick Start](#).

3 Introduction to the HybridDB for MySQL console

To manage instances and the databases in these instances, log on to the [HybridDB for MySQL console](#).

After you enter the console, you can see a list of instances. Click the instance ID or click **Manage** next to the required instance to go to its Basic Information page. To view databases, go to the left-side navigation pane and click **Databases**. Then, click the database name or click **Manage** next to the required database to go to its Basic Information page.

Figure 3-1: HybridDB for MySQL console



The screenshot shows the HybridDB for MySQL console interface. On the left, there is a navigation pane with 'Instances' and 'Databases' options. The main area displays a list of instances under the 'Instances' tab. At the top, there are tabs for different regions: China East 1 (Hangzhou), China North 2 (Beijing), China East 2 (Shanghai), China South 1 (Shenzhen), Germany 1 (Frankfurt), Asia Pacific SE 2 (Sydney), Middle East 1 (Dubai), Singapore, US West 1 (Silicon Valley), US East 1 (Virginia), China North 5 (Huhehaote), and Asia Pacific SE 5 (Jakarta). Below the tabs, there are 'Refresh' and 'Create Instance' buttons. The table below shows two instances:

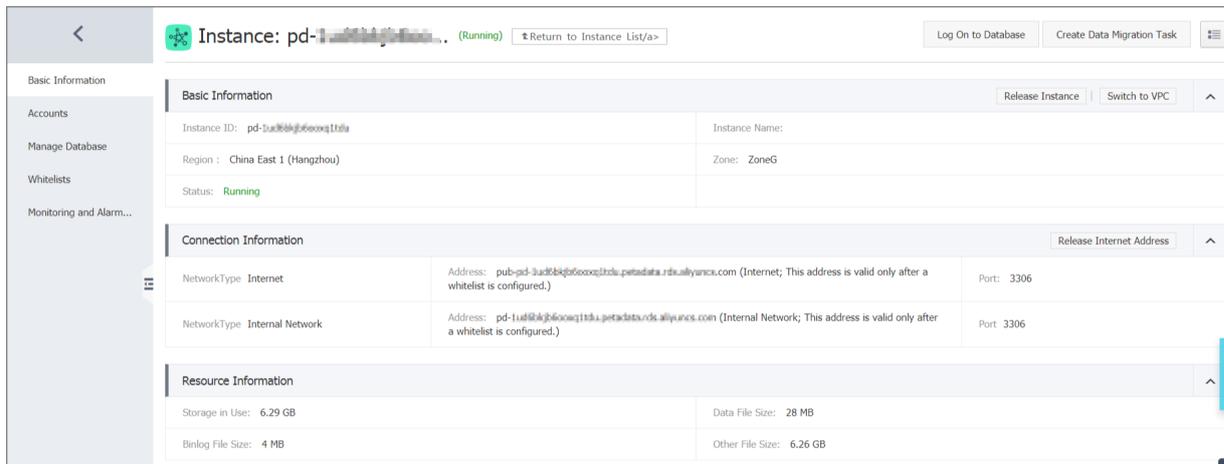
ID/Name	Status	Created At	Region	Network Type	Manage	Release
pd-1a3b9e3d3f4a0a0q1111a	Running	2018-08-16 14:11:15	China East 1 (Hangzhou)(ZoneG)	Classic Network	Manage	Release
pd-1a3b9e3d3f4a0a0q1111a	Running	2018-08-16 14:11:02	China East 1 (Hangzhou)(ZoneG)	Classic Network	Manage	Release

At the bottom right of the table, it says 'Total: 2 item(s), Per Page: 10 item(s)' and there are pagination controls showing page 1 of 1.

On the Basic Information page of an instance, you can choose among the following operations in the left-side navigation pane:

- **Basic Information:** provides basic information about the instance, including its connection and resource information.
- **Accounts:** provides account information and related operational options, including creating accounts, deleting accounts, and changing passwords.
- **Databases:** lists all databases in an instance.
- **Monitoring and Alarms:** provides monitoring and alarm information about the instance, filters monitoring results based on metrics, and sets alarm rules.

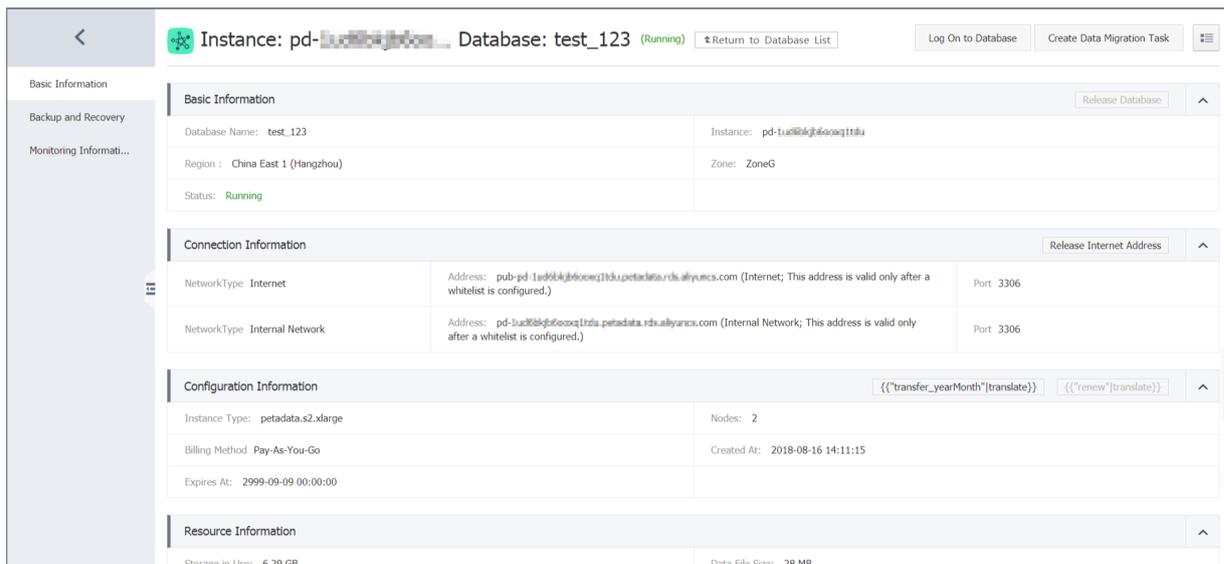
Figure 3-2: Basic information about an instance



On the Basic Information page of a database, you can choose among the following operations in the left-side navigation pane:

- **Basic Information:** provides basic information about the instance, including its connection and resource information.
- **Backup and Recovery:** specifies the backup frequency, views backup sets, and recovers data.
- **Monitor:** provides monitoring information about the database, and filters monitoring results based on metrics.

Figure 3-3: Basic information about a database



4 Manage accounts

1. Log on to the [HybridDB for MySQL console](#) to go to the **Instances** page.
2. Click **Manage** next to the required instance to go to its **Basic Information** page.
3. In the left-side navigation pane, select **Accounts**. In the Account List page, you can click **Delete**, **Reset password**, or **Create account** as needed.

5 Manage instances

5.1 Create an instance

Notes

- You can use HybridDB for MySQL without RDS instances.
- In order to reduce the performance loss caused by the instability of the Internet, it is recommended to purchase an ECS instance to work with HybridDB for MySQL instances. However, you can still access HybridDB for MySQL instances through the Internet.
- To create an instance with more nodes or of higher specifications, [contact us](#).

Prerequisites

- An Alibaba Cloud account is required. If you haven't got one yet, please go to Alibaba Cloud official website to sign up an account.
- Make sure that your account balance is sufficient.

Procedure

1. Log on to the [HybridDB for MySQL console](#) and click **Create Instance**.
2. Select a billing method.
 - **Pay-As-You-Go**: PostPaid billing method, the billing unit is one hour. This billing method is suitable for short-term usage, and the instance can be released at any time saving the cost.
 - **Subscription**: PrePaid billing method, you must pay for the instance when creating a new instance. This billing method is suitable for long-term usage, and it is more affordable than the Pay-As-You-Go billing method. The longer the subscription period you purchase, the more discount you get.



Note:

You can change a Pay-As-You-Go instance to a Subscription instance, but otherwise isn't contrary.

3. Specify the following instance parameters.

Parameter	Description
Region	Regions are the physical locations of instances. You cannot change the region after purchasing the instance.

Parameter	Description
	<ul style="list-style-type: none"> Please select a region based on the geographic location of the target user to improve users' access speed. Ensure that the HybridDB for MySQL instance and the ECS instance to be connected are in the same region. Instances in different regions can only communicate through the Internet which may reduce the performance of the instances.
Zone	Zone is an independent physical area in a region, and there is no substantial difference between different zones. You can create your HybridDB for MySQL instance either in the same zone of the ECS instance, or not in the zone of the ECS instance.
Node Specification	Only High Performance Transaction engine is provided.
Network type	<ul style="list-style-type: none"> Classic network: A classic network type. VPC (recommended): Also known as Virtual Private Cloud. VPC is a private network logically isolated from other virtual networks with higher security and performance than classic networks. If you choose a VPC network, a VPC and a VSwitch which are in the same region of the HybridDB for MySQL should be created beforehand. For more information, see VPC.
Database name	<p>The database name which cannot be changed once it is set, and the Chinese characters are not supported.</p> <div style="background-color: #f0f0f0; padding: 5px;">  Note: HybridDB for MySQL only supports a single database, and you cannot create another database after creating an instance. </div>
Account	The account to access the database, please specify the account with words which can indicate the usage of the account.
Password	The password of the instance account, specify it as required.
Nodes	The default number of nodes is two. The maximum number of nodes for a Subscription instance is up to 64, and the maximum number of nodes for a Pay-As-You-Go instance is up to 128.

4. After the settings are completed, click **Buy Now**.

5. Check the agreement of service on the **Confirm Order** page, and then click **Activate** button to finish the payment.

6. You can find the new instance on the **Instance list** page.

Initializing a HybridDB for MySQL database can take up to 20 minutes. You can perform subsequent operations on the instance once its status in the console becomes **Running**.

Additional information

A new instance keeps in "Creating" status for a long time. This issue is generally caused by insufficient back-end resources, please open a [ticket](#) to fix the issue.

5.2 Set the whitelist

To run a database securely and stably, you must add the IP addresses or CIDR blocks that are used to access the database to a whitelist. You can add up to 1,000 IP addresses.

1. Log on to the [HybridDB for MySQL console](#).
2. In the upper-left corner of the console, select the **region** where the instance is located.
3. Click **Manage** next to the required instance.
4. Click **Whitelist Settings** in the left-side navigation pane.
5. On the **Security** page, click **Create Whitelist**.
6. In the **Add Whitelist** dialog box that appears, specify the **Group Name** and **Whitelist Entries**, and then click **OK**.



Note:

You can click **Load ECS Internal IP** and add the IP addresses of ECS instances to the whitelist. IP addresses are separated with commas (,), such as 192.168.0.1,192.168.0.2. If the Whitelist field is empty or set to 0.0.0.0/0, IP addresses for accessing the database are not restricted. This may mistakenly expose the database to risks.

5.3 Switch network type

Background

HybridDB for MySQL supports two network types: classic network and Virtual Private Cloud (VPC) network. The key difference between the classic network and the VPC is as follows:

- **Classic network:** Cloud services in the classic network are not isolated from each other, and they must use a security group or whitelist policy to reject unauthorized access.
- **VPC:** A VPC is an isolated network environment on the Alibaba Cloud platform. You can customize the route table, IP address range, and gateway for the VPC. You can also combine

your own IDC with your cloud resources in Alibaba Cloud VPC into a virtual IDC by using a leased line or Virtual Private Network (VPN) in order to smoothly migrate applications to the cloud.

Switch to a VPC

Prerequisites

You have created a VPC in the same region as HybridDB for MySQL. For more information about creating a VPC, see [Create a VPC](#).

Procedure

1. Log on to the [HybridDB for MySQL console](#).
2. In the upper-left corner of the console, select the **region** where the instance is located.
3. Click **Manage** next to the required instance.
4. Go to the **Instance Information** page, and click **Switch to VPC**.
5. In the **Switch to VPC** dialog box that appears, specify the **VPC** and **VSwitch**, and click **OK**.

Switch to the classic network

1. Log on to the [HybridDB for MySQL console](#).
2. Click **Manage** next to the required instance.
3. Go to the **Instance Information** page, and click **Switch to Classic Network**.
4. In the **Switch to Classic Network** dialog box that appears, click **OK**.

5.4 Release an instance

You can manually release Pay-As-You-Go instances based on your business needs. Released instances cannot be recovered, perform this operation cautiously.

Prerequisite

The instance must be a Pay-As-You-Go type instance.



Note:

Pay-As-You-Go instances can be released at any time. Subscription instances cannot be manually released, and they are released automatically only when they are overdue.

Procedure

1. Log on to the [HybridDB for MySQL console](#).

2. In the upper-left corner of the console, select the **region** where the instance is located.
3. Click **Manage** next to the required instance.
4. On the **Instance Information** page, click **Release**.
5. In the **Release Instance** dialog box that appears, click **OK**.
6. On the **Mobile Phone Verification** page, click **Obtain Verification Code**. Enter the verification code that you have received on your mobile phone and then click **OK**.

**Note:**

Released instances cannot be recovered. Make sure if you need the instance before you perform this operation.

5.5 Change Pay-As-You-Go to Subscription

After you purchase a Pay-As-You-Go instance, you can switch to the Subscription billing method as needed.

**Note:**

- You cannot switch the billing method from Subscription to Pay-As-You-Go. Before switching to the Subscription billing method, make sure that this operation will not cause excessive resource waste.
- After you switch the billing method, the Subscription billing method takes effect immediately. For more information about billing, see [Pricing](#).
- The system generates a new order for the Subscription billing method. You must complete payment for this order to use the billing method. If the payment is not received for this order, an unpaid order occurs on the page. If this occurs, you cannot purchase any instance or change the billing method.

Prerequisites

- The required instance belongs to the current user.
- This instance uses the Pay-As-You-Go billing method, and is in **Running** status.

Procedure

1. Log on to the [HybridDB for MySQL console](#).
2. In the upper-left corner of the console, select the **region** where the instance is located.
3. Click the required instance name to go to its **Basic Information** page.

4. In the left-side navigation pane, select **Databases**.
5. Click **Subscription Billing** next to the required database.
6. On the **Switch to Subscription Billing** page that appears, drag the **Duration** slider to the required period, read and agree to the Product Terms of Service, and then click **Pay Now**.
7. On the Confirm Order page, click **Pay** to complete the payment.

After the preceding operations are completed, the billing method of the database is displayed as Subscription on the **Databases** page.

5.6 Release an Internet address

If the network environment changed after the Internet address is allocated, you can release the Internet address on HybridDB for MySQL console if you don't need it any more. After releasing the Internet address, make sure to change the application configurations which related to this address.

Before performing this operation, please read the following scenarios.

Scenarios

Internet IP addresses and intranet IP addresses are used in the following scenarios:

- Use an intranet IP address when:
 - The system provides an intranet IP address by default. You can modify this address directly.
 - The ECS instance where your application is deployed and your HybridDB for MySQL instance run in the same *type of network* and in the same region.
- Use an Internet IP address when:
 - The ECS instance where your application is deployed and your HybridDB for MySQL instance run in different regions.
 - The application is deployed in a third-party system.
- Use both an intranet IP address and an Internet IP address when:
 - The ECS instance where some modules are deployed, and your HybridDB for MySQL instance, run in the same *type of network* and in the same region, but another ECS instance where other modules are deployed runs in a different region to your HybridDB for MySQL instance.

- The ECS instance where some modules are deployed and your HybridDB for MySQL instance run in the same *type of network* and in the same region, but other modules are deployed in a third-party system.

Procedure

1. Log on to the [HybridDB for MySQL console](#).
2. Click the required **instance name** from the list of instances, or click **Manage** next to the required instance to go to its **Basic Information** page.
3. Click **Release Internet Address** button in the Connection information segment on the **Basic Information** page.

If you haven't applied for an Internet address since you created an instance, the **Release Internet address** button will be gray.

4. Click **OK** in the dialog box to release the Internet IP address.

6 Manage databases

6.1 Log on to a database

Databases in HybridDB for MySQL are compatible with MySQL protocols. You can access a HybridDB for MySQL database using the MySQL client or program.

Prerequisites

- You have created an instance and a database in the [HybridDB for MySQL console](#), and they are in Running status.
- You have created an instance and a database in the [HybridDB for MySQL console](#), and they are in Running status.
- The client IP address is included in the whitelist. For more information about the operation, see [Set the whitelist](#).
- You can also choose **Manage** > **Basic Information** in the console to see the IP address and port number of the instance.

Connection Information		Release Internet Address	^
NetworkType: Internet	Address: pub-pd-1a024k36oo0q1tda.petadata.rds.aliyuncs.com (Internet; This address is valid only after a whitelist is configured.)	Port: 3306	
NetworkType: Internal Network	Address: pd-1u4t8k36oo0q1tda.petadata.rds.aliyuncs.com (Internal Network; This address is valid only after a whitelist is configured.)	Port: 3306	

Access HybridDB for MySQL using the MySQL client

On the MySQL client, you can use a CLI to access the database.



Note:

By default, you can use the ECS client to access HybridDB for MySQL over the internal network. To access the database over a public network, you must request a public IP address.

```
mysql -h example.petadata.rds.aliyuncs.com -P 3306 -u UserName -p Password dbname
```

The parameters in the preceding statement are described as follows:

- **-h**: specifies the host name of the instance, that is, the internal network address or public network address of the instance. To access an instance using an internal network address, you must install the MySQL client on the ECS instance.
- **-P**: specifies the port number.

- **-u**: specifies the database account.
- **-p**: specifies the account password.
- **dbname**: specifies the database name.

Additional information

If you encounter any problem during logging on to the database, please refer to the following information to solve the problem.

1. Has the IP address of the client or the IP address of ECS been added to the whitelist?

Not yet, see [Set the whitelist](#) for more information.

2. How to get the IP address of the client or the IP address of ECS?

See [How to get the IP address of a client](#) for more information.

6.2 Back up a database

You can set a backup policy for backing up a specified database automatically.

Procedure

1. Log on to the [HybridDB for MySQL console](#) to go to the **Instances** page.
2. Click the required instance **ID** from the list of instances, or click **Manage** next to the required instance to go to its Basic Information page.
3. In the left-side navigation pane, click **Databases**.
4. Click **Manage** next to the required database to go to its **Basic Information** page.
5. In the left-side navigation pane, click **Backup and Recovery**.
6. On the **Backup Settings** tab page, click **Edit** to set related parameters. For more information about setting backup parameters, see the following table.
7. Click **OK** to complete settings.

Table 6-1: Backup settings

Parameter	Description
Data Retention Period	Supports values from 7 days to ~730 days. The default value is 7 days.
Backup Cycle	Specifies the backup cycle by weeks.
Backup Time	Specifies the time period in which the database is backed up.

Parameter	Description
Backup Switch	Switches backup status. By default, backup is switched off.

6.3 Scale up a database

Data volume and computing workload increase over time when you use HybridDB for MySQL. However, data processing speed may be limited by computing resource availability, including CPU, disk space, memory, and the number of data processing nodes. HybridDB for MySQL provides online database scaling to support dynamic instance scaling.



Note:

Scaling a database will interrupt your connection. Perform scaling during off-peak hours and make sure your applications have a reconnection mechanism.

1. Log on to the [HybridDB for MySQL console](#) to go to the **Instances** page.
2. In the upper-left corner of the console, select the **region** where the instance is located.
3. Click the instance **ID**, or click **Manage** next to the required instance to enter the Basic Information page.
4. In the left-side navigation pane, click **Databases** to view the instance databases.
5. Click **Scale** next to the required database to go to the **Configuration upgrade** page.

You can double the nodes of the database.

Database Name	Instance Type	NodeNumber	Status	Regular/Read-Only	Billing Method	Created At	Actions
test_123	petadata.s2.xlarge	2	Running	Regular	Pay-As-You-Go	2018-09-10 11:42:22	Switch to Subscription Scale Manage

6. Click the Agreement of Service and then click **Activate** to finish the operation.
 - By default, HybridDB for MySQL doubles storage capacity during scaling.
 - After you complete the scaling operation, it may take 20 minutes before the service functions normally.
 - Scaling of Pay-As-You-Go instances takes effect immediately. Billing for Pay-As-You-Go instances based on the new specifications will start from the next billing cycle (next hour).
 - Scaling of Subscription instances takes effect immediately. Subscription users will need to pay for the scaling immediately.

7 Import data

7.1 Import data using Data Integration

You can use [Data Integration](#) to import full data or filtered data to HybridDB for MySQL.

Prerequisites

1. You have created the target database and table using the HybridDB for MySQL client before importing data.
2. To import data from ApsaraDB for RDS, you must go to the RDS console and set the **IP whitelist**. For more information, see [Set the whitelist](#). Go to the HybridDB for MySQL console and add the following IP addresses to the whitelist:

```
10.152.69.0/24,10.153.136.0/24,10.143.32.0/24,120.27.160.26,10.46.67  
.156,120.27.160.81,10.46.64.81,121.43.110.160,10.117.39.238,121.43.  
112.137,10.117.28.203,118.178.84.74,10.27.63.41,118.178.56.228,10.27
```

```
.63.60,118.178.59.233,10.27.63.38,118.178.142.154,10.27.63.15,100.64.0.0/8
```

Add Whitelist

Group Name :

Whitelist Entries :

[Load ECS Internal IP](#)

Use commas (,) to separate multiple IP addresses. Example
192.168.0.1,192.168.0.2

 **Note:**
If you use a custom resource group to synchronize data in HybridDB for MySQL, you must add the IP addresses in the custom resource group to the whitelist of HybridDB for MySQL.

Add a data source

 **Note:**
Only the project administrator can create a data source. Other roles can only view data sources.

For more information about the operations, see [Configure the data source](#). You must select a MySQL data source.

Configure a synchronization task in Wizard Mode

For more information about the operations, see [Configure the synchronization task in wizard mode](#).

Submit a data synchronization task

After you save the synchronization task, click **Run** to run this task, or click **Submit** to submit the task to the scheduling system. The scheduling system then runs the task automatically according to the configurations in the next day.

7.2 Import data using Data Transmission Service

You can use [Data Transmission Service \(DTS\)](#) to migrate existing data or incremental data to HybridDB for MySQL.

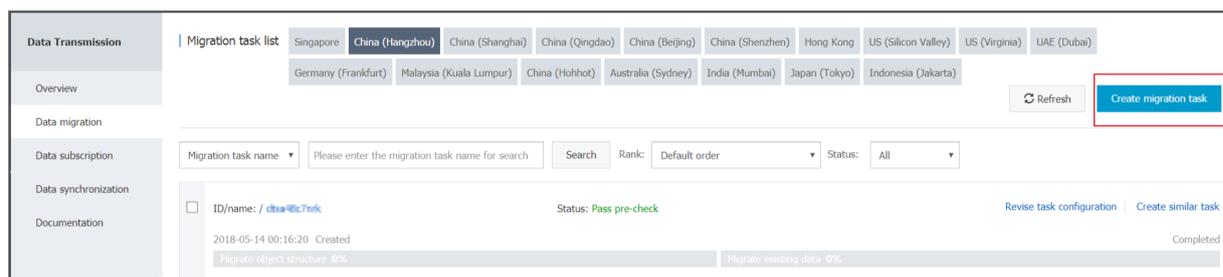
Prerequisites

You have created a database and a table that data can be migrated to in HybridDB for MySQL.

Create a task

Go to the [Data Transmission Service console](#).

Go to the Data migration page and click **Create migration task**.



Source database and target database

You can use an RDS instance or create a MySQL database as the source database. If you select the **RDS instance** type as the source database, select the RDS instance ID, and enter the database account and password.

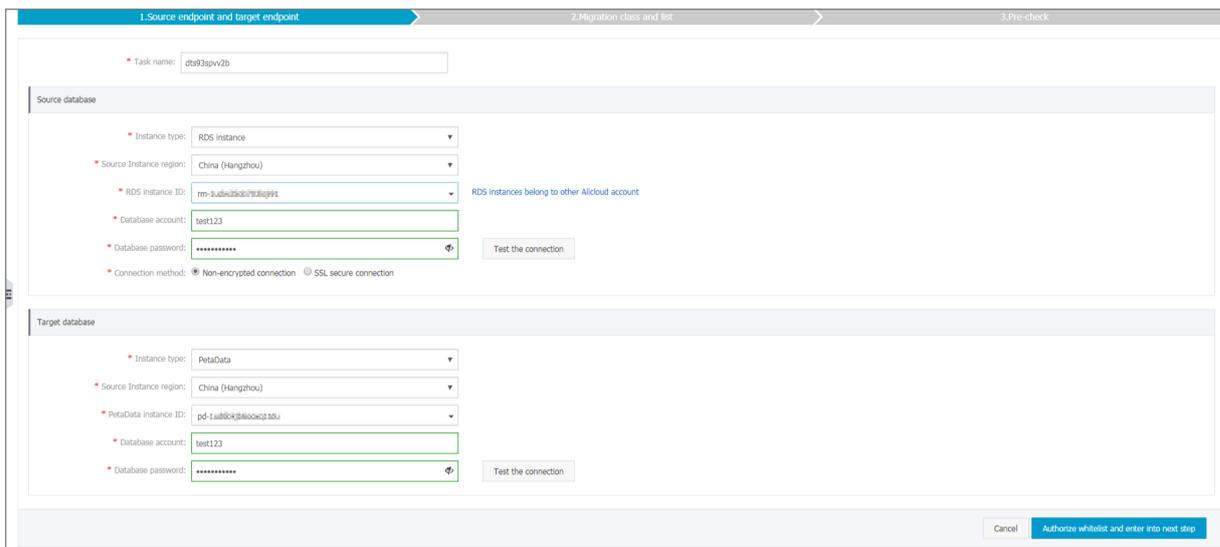


Note:

DTS supports **Existing data migration** and **Incremental replication** migration type to migrate data from an RDS instance or a MySQL database to HybridDB for MySQL.

Select **PetaData** as the target database, and specify the instance ID, and database account and password.

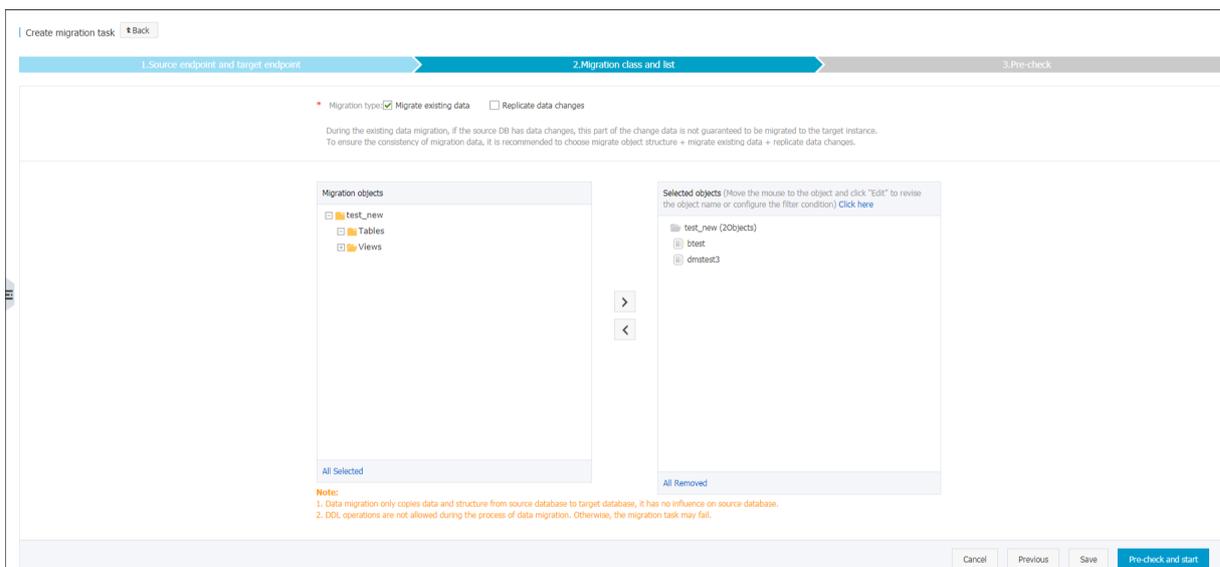
Click **Authorize whitelist and go to the next step** for configuring the source database and table.



Configure the source database and table

Next, configure the migration class and list. In the left-side pane, select the source database and table, and then click the rightwards arrow in the middle of the page to add the database and table to the right pane.

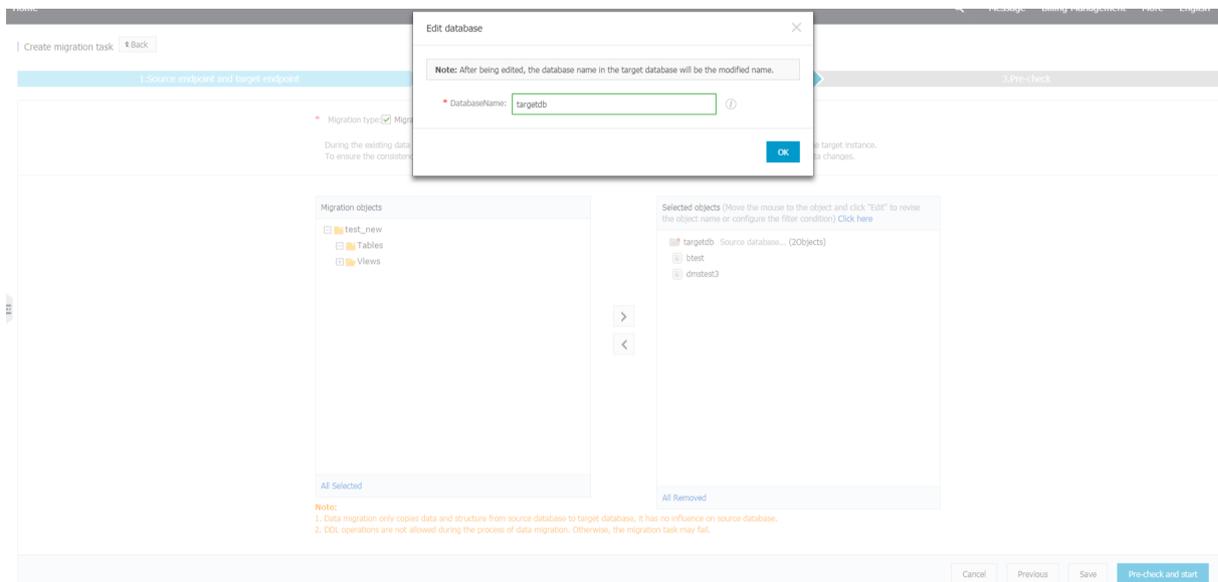
In this example, two tables (btest and dmstest3) in the source database test_new are migrated.



Configure the target database and table

Click the **Edit** next to the source database test_new to edit the database name into the target database name in HybridDB for MySQL.

In this example, data is migrated to the targetdb database in HybridDB for MySQL.



Click **OK**.

Click **Pre-check** and start to start the pre-check.

Pre-check



Note:

You must have created the target database and table before migrating data to HybridDB for MySQL. Otherwise, the following error may occur during the pre-check:

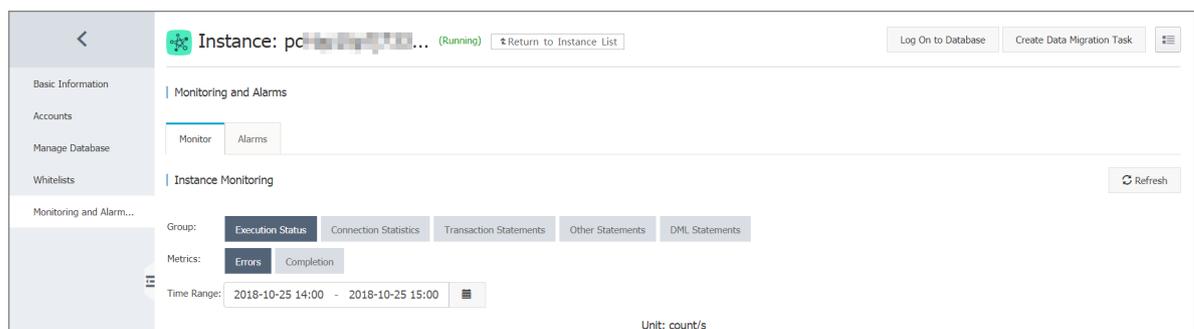
8 Monitoring and alarming

8.1 Monitoring

HybridDB for MySQL provides monitoring and alarm information of instances. You can query the instance performance metrics to analyze the instances usage, collect business trend statistics, and locate and diagnose instance problems.

- The metric data is collected every 5 minutes.
 - You can only query the metric data of the last 30 days.
1. Log on to the [HybridDB for MySQL console](#) to go to the **Instances** page.
 2. In the upper-left corner of the console, select the **region** where the instance is located.
 3. Click the instance **ID**, or click **Manage** next to the required instance to enter the **Basic Information** page.
 4. In the left-side navigation pane, click **Monitoring and Alarms** to enter the **Monitoring** tab page.

On the **Monitoring** tab page, you can specify the **Group**, **Metrics**, and **Time Range** to filter the monitoring results. For more information about monitoring, see [HybridDB for MySQL monitoring overview](#).



8.2 Alarming

1. Log on to the [HybridDB for MySQL console](#) to go to the **Instances** page.
2. In the upper-left corner of the console, select the **region** where the instance is located.
3. Click the required instance **ID** from the list of instances, or click **Manage** next to the required instance to go to the Basic Information page.
4. Click **Monitoring and Alarms** in the left-side navigation pane to go to the Monitoring tab page.
5. Click the **Alarms** tab to go to the Alarms tab page.

This page lists the alarm rules that have been defined.

6. To set alarm rules, click **Set Alarm Rules** in the upper-right corner.

For more information about setting alarm rules, see [Alarm Service](#).