

Distributed Database Middleware

Getting Started

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1 Overview

Scenarios

This section describes how to associate a DDM instance with a data node (RDS for MySQL instance).

Process of Using DDM

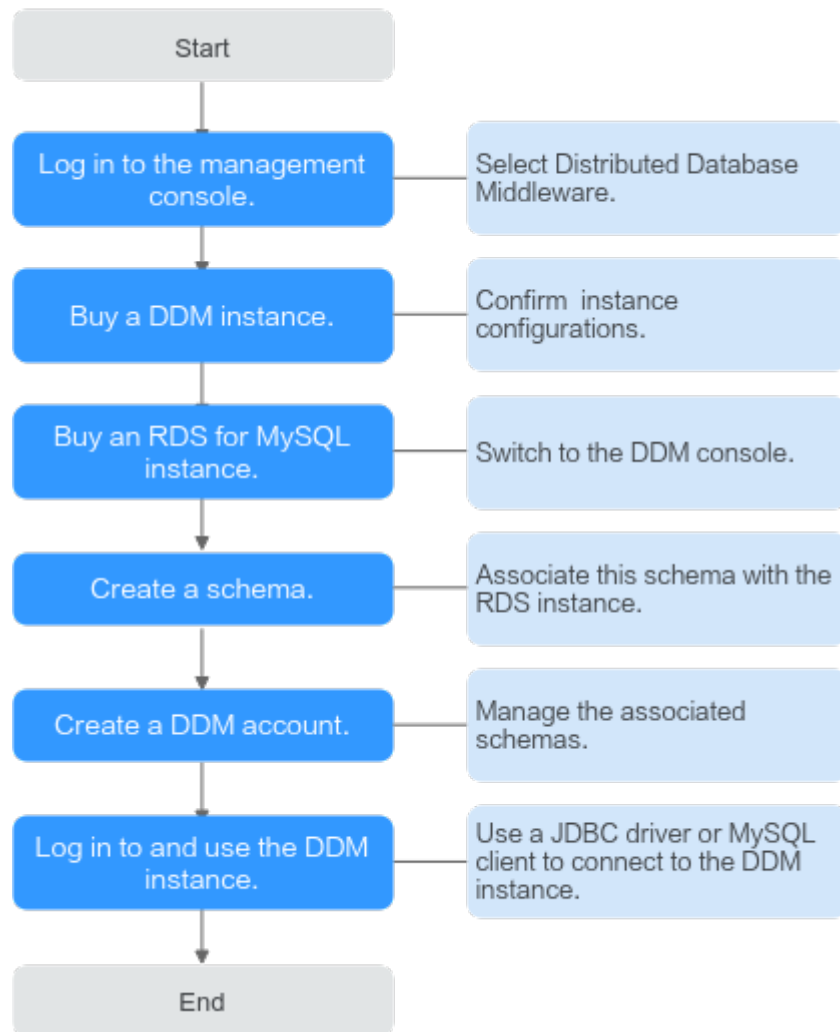
[Step 1: Buy a DDM Instance and an RDS for MySQL Instance](#)

[Step 2: Create a Schema and Associate It with an RDS for MySQL Instance](#)

[Step 3: Create a DDM Account](#)

[Step 4: Log In to the DDM Schema](#)

Figure 1-1 Flowchart for using DDM



2 Step 1: Buy a DDM Instance and an RDS for MySQL Instance

Procedure


- Step 1** Log in to the management console.
- Step 2** Click  in the upper left corner and select the required region.
- Step 3** Click **Service List** and choose **Databases > Distributed Database Middleware**.
- Step 4** On the **Instances** page, in the upper right corner, click **Buy DDM Instance**.
- Step 5** On the displayed page, configure the required parameters.

Table 2-1 Parameter description

Parameter	Description
Billing Mode	DDM instance billing mode, which can be Yearly/Monthly or Pay-per-use . You can change the billing mode after purchasing an instance. <ul style="list-style-type: none">• Yearly/Monthly: Specify a required duration, and you will be billed based on the service price.• Pay-per-use: Do not specify any required duration because the system bills you based on how much the service is used.
Region	Region where the DDM instance is located. Select the required region.

Parameter	Description
AZ	<p>Availability zone where the DDM instance is deployed.</p> <p>Nodes in a DDM instance can be deployed on different physical servers in the same AZ to keep services always available even if one physical server becomes faulty.</p> <p>A DDM instance can be deployed across AZs to provide cross-AZ DR.</p> <p>If necessary, you can select multiple AZs when you create a DDM instance. Then nodes of the instance will be deployed in multiple different AZs.</p> <p>NOTE Deploy your application, DDM instance, and required RDS instances in the same AZ to reduce network latency. Cross-AZ deployment may increase network latency.</p>
Instance Name	<p>Name of the DDM instance, which:</p> <ul style="list-style-type: none"> • Cannot be left blank. • Must start with a letter. • Must be 4 to 64 characters long. • Can contain only letters, digits, and hyphens (-). • Cannot contain other special characters.
Node Class	<p>Class of the DDM instance node. You can select General-enhanced or Kunpeng general computing-plus and then specify a node class.</p> <p>NOTE Estimate compute and storage requirements of your applications based on your service type and scale before you buy a DDM instance, and then select an appropriate node class so that the CPU and memory specifications of your DDM instance can better meet your needs.</p>
Instance Nodes	<p>Number of nodes in a DDM instance. Up to 32 nodes are supported.</p> <p>NOTE Selecting at least 2 nodes is recommended because a single node cannot provide the same level of availability.</p>
VPC	<p>VPC that the DDM instance belongs to. This VPC isolates networks for different services. It allows you to manage and configure private networks, simplifying network management.</p> <p>Click View VPC to show more details and security group rules.</p> <p>NOTE The DDM instance should be in the same VPC as the required RDS for MySQL instance.</p> <p>To ensure network connectivity, the DDM instance you purchased must be in the same VPC as your applications and RDS for MySQL instances.</p>
Subnet	Name and IP address range of the subnet

Parameter	Description
Security Group	Select an existing security group. You are advised to select the same security group for your DDM instance, application, and RDS for MySQL instances so that they can communicate with each other. If different security groups are selected, add security group rules to enable network access.
Parameter Template	Select an existing parameter template. You can also click View Parameter Template to set parameters on the displayed page.
Enterprise Project	EPS provides a unified method to manage cloud resources and personnel by enterprise project.
Tags	Tags can be added to instances to help you manage instances and collect expense data.
Required Duration	Duration of the purchased DDM instance. This parameter is available only if Billing Mode is set to Yearly/Monthly . You can select 1 month, 2 months, 3 months, 4 months, 5 months, 6 months, 7 months, 8 months, 9 months, or 1 year. If you select Auto-renew , the renew cycle is the same as the selected duration.

Step 6 After the configuration is complete, click **Next** at the bottom of the page.

Step 7 Confirm the configuration information and perform subsequent operations based on the billing mode you select:

- If you select pay-per-use, click **Submit**.
- If you select yearly/monthly, click **Pay Now**.

Step 8 To view and manage the instance, go to the **Instances** page.

The default database port is **5066** and can be changed after a DDM instance is created.

For details, see [Changing a Database Port](#).

Step 9 Switch to the RDS console, click **Buy DB Instance** in the upper right corner, specify the required information, and click **Next**.

 **CAUTION**

The RDS for MySQL instance you will buy must be in the same VPC and subnet as your DDM instance. If they are not in the same subnet, configure routes to ensure network connectivity.

Step 10 Wait 1 to 3 minutes till the instance is created.

----End

3 Step 2: Create a Schema and Associate It with an RDS for MySQL Instance

You can create a schema on the **Instances** or **Schemas** page. This section uses the **Instances** page as an example to describe how to create a schema.

Figure 3-1 Instances page

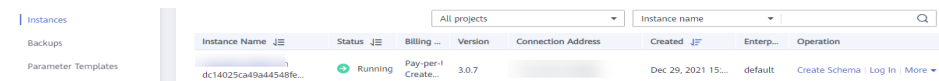
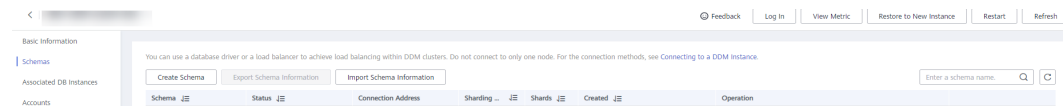


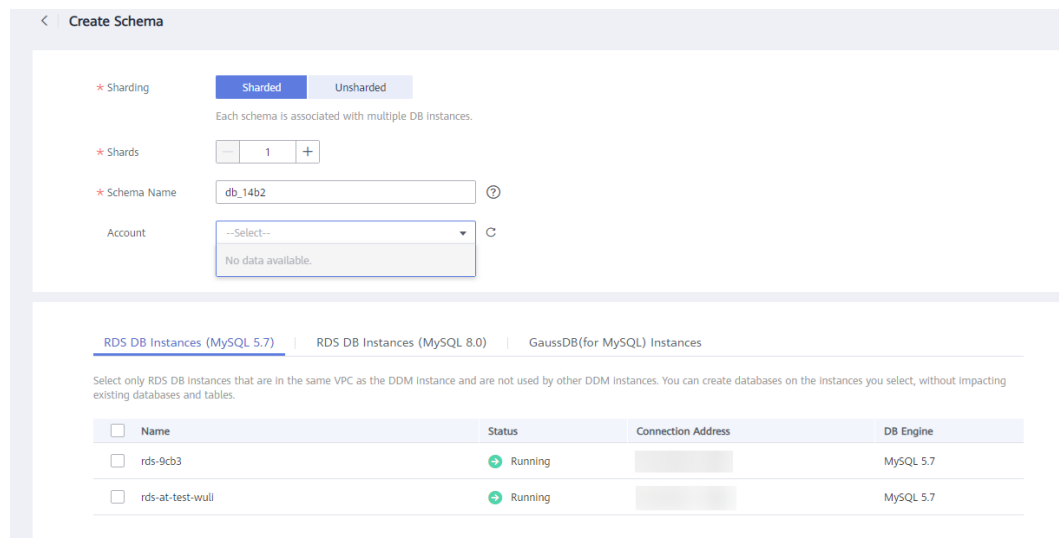
Figure 3-2 Schemas page



Procedure

- Step 1** Log in to the DDM console, and in the navigation pane, choose **Instances**. In the instance list, locate the required DDM instance and click **Create Schema** in the **Operation** column.
- Step 2** On the displayed page, specify a sharding mode, enter a schema name, set the number of shards, select the required DDM accounts, and click **Next**.

Figure 3-3 Creating a schema

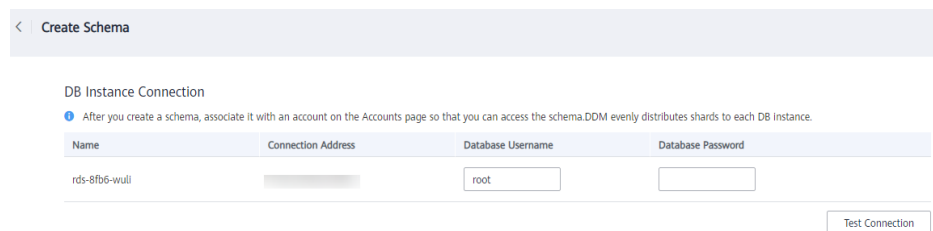


NOTE

- DDM supports two sharding options:
 - **Sharded:** indicates that one schema can be associated with multiple data nodes, and all shards will be evenly distributed across the nodes.
 - **Unsharded:** indicates that one schema can be associated with only one data node, and only one shard can be created on that instance.
- **Schema Name:** indicates the name of the schema. The name contains 2 to 48 characters and must start with a lowercase letter. Only lowercase letters, digits, and underscores (_) are allowed.
- **Shards:** indicates the total number of shards that can be created in the schema. The number of shards on a data node cannot exceed 64. If more than 64 shards are required, contact DDM technical support.

Step 3 Enter the database password and click **Test Connection**.

Figure 3-4 Testing the connection



Step 4 After the test becomes successful, click **Finish**.

----End

4 Step 3: Create a DDM Account

Procedure

- Step 1** Log in to the DDM console, in the instance list, locate the required DDM instance and click its name.
- Step 2** In the navigation pane, choose **Accounts**.
- Step 3** On the displayed page, click **Create Account** and configure the required parameters.

Table 4-1 Required parameters

Parameter	Description
Username	Username of the account. The username can include 1 to 32 characters and must start with a letter. Only letters, digits, and underscores (_) are allowed.
Password	Password of the account. The password: <ul style="list-style-type: none"> • Can include 8 to 32 characters. • Must contain at least three of the following character types: letters, digits, swung dashes (~), and exclamation marks (!). @ # % ^ * - _ = + ? • Cannot be a weak password. It cannot be overly simple and easily guessed.
Confirm Password	-
Schema	Schema to be associated with the DDM account. You can select an existing schema from the drop-down list. Only the associated schemas can be accessed using the account.
Permissions	Options: CREATE , DROP , ALTER , INDEX , INSERT , DELETE , UPDATE , and SELECT . You can select any or a combination of them.

Parameter	Description
Description	Description of the account, which cannot exceed 256 characters.

Step 4 Click **OK**.

----**End**

5 Step 4: Log In to the DDM Schema

After you buy a DDM instance, you can log in to it using a client such as Navicat, or connect to the required schema in the instance using the CLI or JDBC driver.

This section describes how to log in to a DDM instance or a schema.

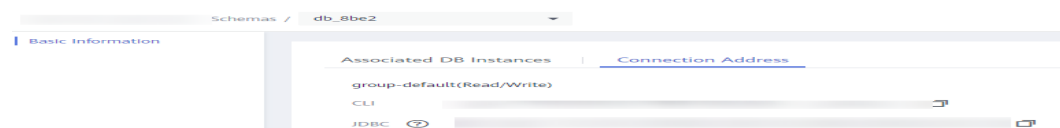
Preparations

Before you log in to your DDM instance or schema, you have to obtain its connection address.

Obtaining the Schema Connection Address

- Step 1** Log in to the DDM console.
- Step 2** Hover on the left menu to display **Service List** and choose **Databases > Distributed Database Middleware**.
- Step 3** In the navigation pane, choose **Instances**. In the instance list, locate the required DDM instance and click its name.
- Step 4** In the navigation pane, choose **Schemas**.
- Step 5** In the schema list, locate the required schema and click its name.
- Step 6** In the **Connection Address** area, view CLI and JDBC connection addresses.

Figure 5-1 Schema connection address



 **NOTE**

- If load balancing is enabled, one floating IP address will be assigned to a DDM instance even if it has multiple nodes. You can use this address to connect to the DDM instance for load balancing.
- There are some historical instances that do not support load balancing, so they have multiple IP addresses. For load balancing, you can use JDBC connection strings to connect to them.
- If read-only groups are created, each group will be assigned a load balancing address for service isolation.

----End

Connection Methods

For details about method 1, see [Using Navicat to Log In to a DDM Instance](#).

For details about method 2, see [Using the MySQL CLI to Log In to a Schema](#).

For details about method 3, see [Using a JDBC Driver to Log In to a Schema](#).

For details about method 4, see [Logging In to a DDM Instance on the DDM Console](#).

 **NOTE**

1. For security purposes, select an ECS in the same VPC as your DDM instance.
2. Ensure that a MySQL client has been installed on the required ECS or the MySQL connection driver has been configured.
3. Before you log in to a DDM instance, configure its information on the client or connection driver.

Using Navicat to Log In to a DDM Instance

Step 1 Log in to the DDM console, locate the required DDM instance, and click its name.

Step 2 Ask technical support to add an EIP to the feature whitelist. In the **Instance Information** area, click **Bind**. In the displayed dialog box, select the EIP and click **OK**. Bind the EIP with your DDM instance.

Step 3 In the navigation pane on the left, click the VPC icon and choose **Access Control > Security Groups**.

Step 4 On the **Security Groups** page, locate the required security group and click **Manage Rule** in the **Operation** column. On the displayed page, click **Add Rule**. Configure the security group rule as needed and click **OK**.

 **NOTE**

After binding an EIP to your DDM instance, set strict inbound and outbound rules for the security group to enhance database security.

Step 5 Open Navicat and click **Connection**. In the displayed dialog box, enter the host IP address (EIP), username, and password (DDM account).

 **NOTE**

Navicat12 is recommended for Navicat clients.

Step 6 Click **Test Connection**. If a message is returned indicating that the connection is successful, click **OK**. The connection will succeed 1 to 2 minutes later. If the connection fails, the failure cause is displayed. Modify the required information and try again.

----End

 **NOTE**

Using Navicat to access a DDM instance is similar to using other visualized MySQL tools such as MySQL Workbench. Therefore, the procedure of using other visualized MySQL tools to connect to a DDM instance has been omitted.

Using the MySQL CLI to Log In to a Schema

Step 1 Log in to the required ECS, open the CLI, and run the following command:

```
mysql -h ${DDM_SERVER_ADDRESS} -P${DDM_SERVER_PORT} -u${DDM_USER} -p [-D${DDM_DBNAME}]
[--default-character-set=utf8][--default_auth=mysql_native_password]
```

Table 5-1 Parameter description

Example Parameter	Description	Example Value
DDM_SERVER_ADDRES S	IP address of the DDM instance	192.168.0. 200
DDM_SERVER_PORT	Connection port of the DDM instance	5066
DDM_USER	Account of the DDM instance	dbuser01
DDM_DBNAME	(Optional) Name of the target schema in the DDM instance	-
default-character- set=utf8	(Optional) Select character set UTF-8 for encoding. Configure this parameter if garbled characters are displayed during parsing due to inconsistency between MySQL connection code and actually used code.	-
default_auth=mysql_nat ive_password	The password authentication plug-in is used by default.	-

 **NOTE**

If you use the MySQL 8.0 client, set **default_auth** to **mysql_native_password**.

Step 2 View the command output. The following is an example output of running a MySQL command in the Windows CLI.

```
C:\Users\testDDM>mysql -h192.168.0.200 -P5066 -Ddb_5133 -udbuser01 -p
Enter password:
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A
```

```
Welcome to the MySQL monitor.  Commands end with ;or \g.
Your MySQL connection id is 5
Server version: 5.6.29

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Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```

----End

Using a JDBC Driver to Log In to a Schema

Step 1 Load the required JDBC driver.

```
Class.forName(com.mysql.jdbc.Driver);
```

NOTE

JDBC drivers 5.1.35 to 5.1.45 are recommended.

Step 2 Create a database connection.

```
String username = "dbuser01" ;
String password = "xxxxxx" ;
String url = "jdbc:mysql://192.168.0.200:5066/db_5133";
Connection con = DriverManager.getConnection(url , username , password);
```

Step 3 Create a Statement object.

```
Statement stmt = con.createStatement();
```

Step 4 Execute the required SQL statement.

```
ResultSet rs = stmt.executeQuery("select now() as Systemtime");
con.close();
```

Step 5 (Optional) Optimize code as needed.

```
loadBalanceAutoCommitStatementThreshold=5&loadBalanceHostRemovalGracePeriod=15000&loadBalance
BlacklistTimeout=60000&loadBalancePingTimeout=5000&retriesAllDown=10&connectTimeout=10000";
```


 NOTE

- Parameters **loadBalanceAutoCommitStatementThreshold** and **retriesAllDown** must be configured based on the example in [Step 5](#). Otherwise, an infinite loop may occur during the connection switchover, resulting in stack overflow.
- **loadBalanceAutoCommitStatementThreshold**: defines the number of matching statements which will trigger the driver to potentially swap physical server connections.
- **loadBalanceHostRemovalGracePeriod**: indicates the grace period to wait for a host being removed from a load-balanced connection, to be released when it is the active host.
- **loadBalanceBlacklistTimeout**: indicates the time in milliseconds between checks of servers which are unavailable, by controlling how long a server lives in the global blacklist.
- **loadBalancePingTimeout**: indicates the time in milliseconds that the connection will wait for a response to a ping operation when you set **loadBalanceValidateConnectionOnSwapServer** to **true**.
- **retriesAllDown**: indicates the maximum number of connection attempts before an exception is thrown when a valid host is searched. `SQLException` will be returned if the threshold of retries is reached with no valid connections obtained.
- **connectTimeout**: indicates the maximum amount of time in milliseconds that the JDBC driver is willing to wait to set up a socket connection. **0** indicates that the connection does not time out. Only JDK-1.4 or later is supported. The default value **0**.

----End

Logging In to a DDM Instance on the DDM Console

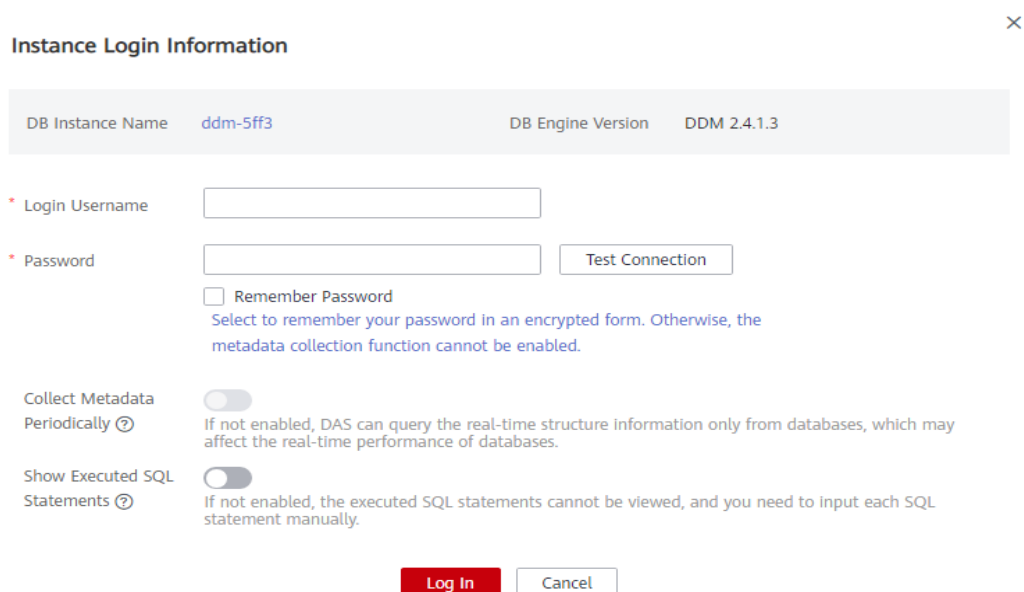
Step 1 Log in to the DDM console.

Step 2 In the navigation pane, choose **Instances**.

Step 3 In the instance list, locate the required instance and click **Log In** in the **Operation** column.

On the displayed page, enter the required username and password.

Figure 5-2 Login page



The screenshot shows a dialog box titled "Instance Login Information" with a close button (X) in the top right corner. The dialog contains the following elements:

- A header bar with "DB Instance Name" set to "ddm-5ff3" and "DB Engine Version" set to "DDM 2.4.1.3".
- A "Login Username" field with an asterisk (*) indicating it is required.
- A "Password" field with an asterisk (*) indicating it is required, and a "Test Connection" button to its right.
- A "Remember Password" checkbox, which is currently unchecked. Below it is a note: "Select to remember your password in an encrypted form. Otherwise, the metadata collection function cannot be enabled."
- A "Collect Metadata Periodically" toggle switch, which is currently turned off. Below it is a note: "If not enabled, DAS can query the real-time structure information only from databases, which may affect the real-time performance of databases."
- A "Show Executed SQL Statements" toggle switch, which is currently turned off. Below it is a note: "If not enabled, the executed SQL statements cannot be viewed, and you need to input each SQL statement manually."
- At the bottom, there are two buttons: a red "Log In" button and a white "Cancel" button.

Step 4 On the displayed page, enter username and password of the DDM account.

Step 5 Click **Test Connection**.

Step 6 (Optional) Enable **Collect Metadata Periodically** and **Show Executed SQL Statements**.

Step 7 Ensure that all settings are correct and click **Log In**.

----End

A Change History

Released On	Description
2022-09-30	This is the first official release.