Distributed Database Middleware

Getting Started

Issue 01

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1 Overview

Scenarios

This section uses an RDS DB instance as an example to describe how to use DDM.

Process of Using DDM

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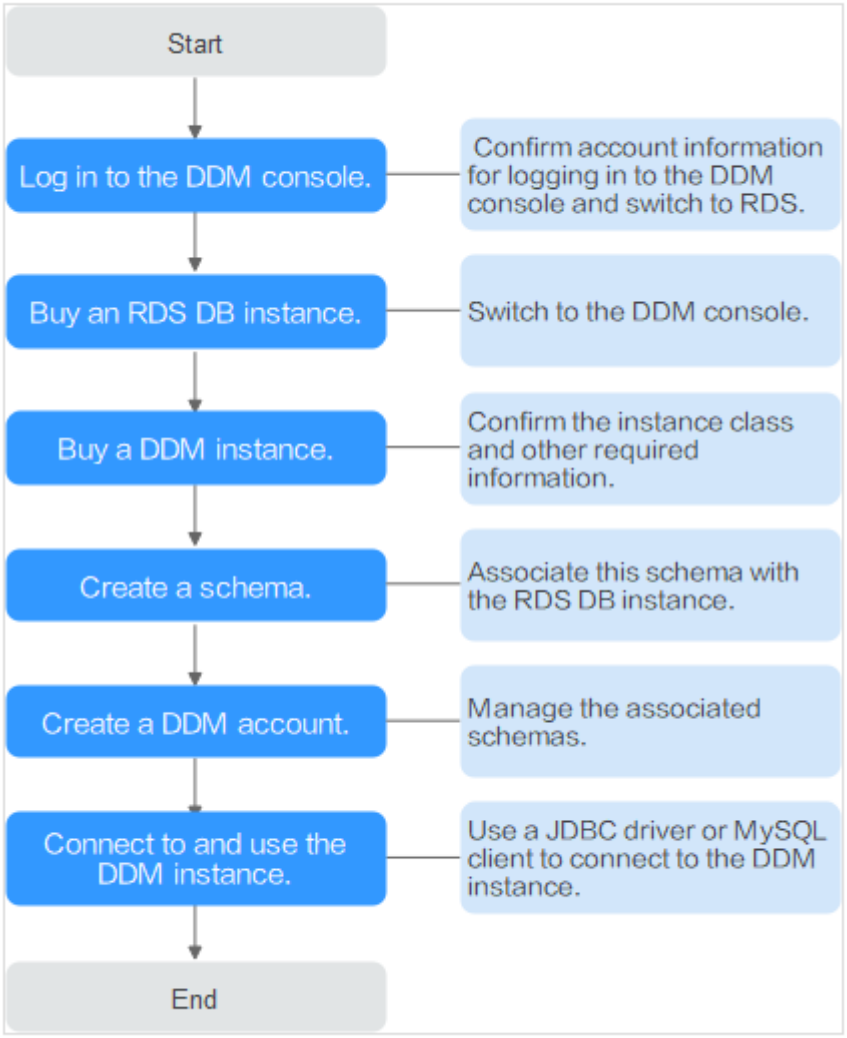
Step 3: Buy a DDM Instance

Step 4: Create a Schema

Step 5: Create a DDM Account

Step 6: Connect to the DDM Instance or Schema

Figure 1-1 Flowchart for using DDM

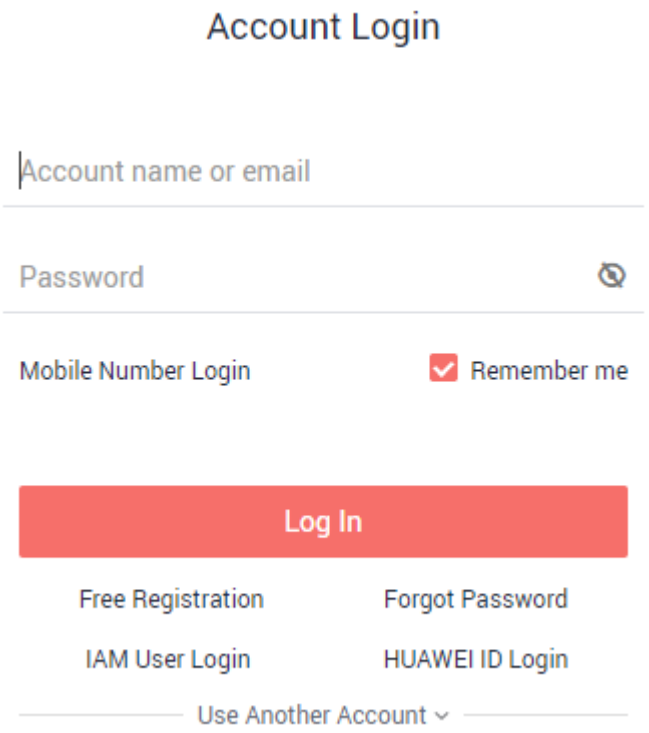


2 Step 1: Log In to the DDM Console

Procedure

Step 1 Enter the required username and password to log in to the HUAWEI CLOUD management console.

Figure 2-1 Login page



Step 2 Click in the upper left corner and select the required region, for example, CN Southwest-Guiyang1.

Step 3 Click **Service List** and choose **Database** > **Distributed Database Middleware**.

Figure 2-2 Selecting Distributed Database Middleware

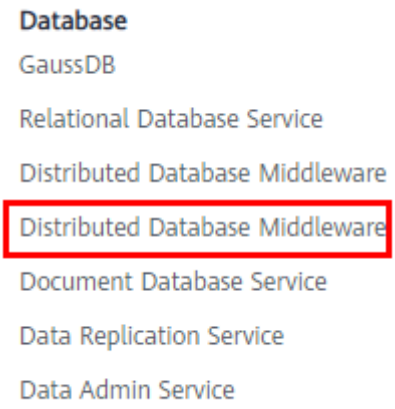
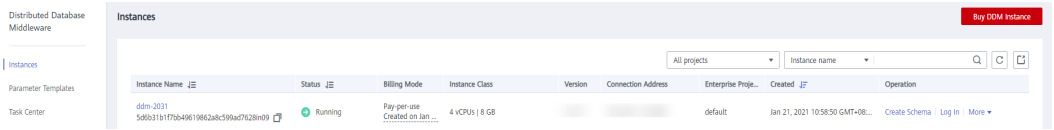


Figure 2-3 Instances page



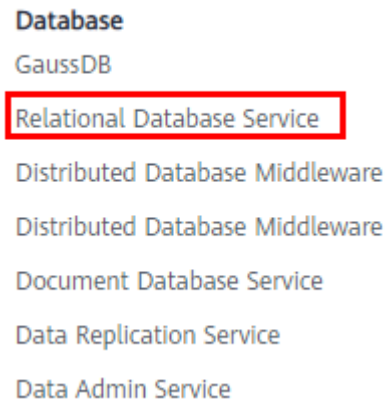
----End

3 Step 2: Buy an RDS DB Instance

Procedure

Step 1 On the DDM console, click **Service List** and choose **Database** > **Relational Database Service**.

Figure 3-1 Relational Database Service



Step 2 On the displayed page, click **Buy DB Instance** in the upper right corner, specify **Billing Mode**, **DB Engine**, **Instance Class**, and other required parameters, and click **Next**.

Step 3 On the displayed page, confirm the configurations.

Step 4 Perform subsequent operations based on the billing mode you select:

- For pay-per-use, click **Submit**.
- For yearly/monthly, click **Pay Now**.

Step 5 Wait 1 to 3 minutes for the RDS DB instance to be created.

----End

4 Step 3: Buy a DDM Instance

Procedure

Step 1 On the RDS console, click **Service List** and choose **Database** > **Distributed Database Middleware**.

Step 2 On the displayed page, in the upper right corner, click **Buy DDM Instance**.

Step 3 On the displayed page, configure the required parameters.

Table 4-1 Required parameters

Parameter	Description
Billing Mode	DDM instance billing mode, which can be set to **Yearly/Monthly** or **Pay-per-use**. You can change the billing mode after purchasing an instance. • **Yearly/Monthly**: Specify a required duration. The system will deduct the fees incurred from your account based on the service price. • **Pay-per-use**: Do not specify a required duration because the system deducts the fees incurred from your account based on how much the service is used.
Region	Region where the DDM instance is located. Select the required region.
AZ	Availability zone where the DDM instance is deployed. Currently, some regions support cross-AZ deployment to enhance availability of DDM instances. You can select cross-AZ deployment for your DDM instance. In this case, instance nodes will be deployed in different AZs. **NOTE** Deploy your application, DDM instance, and required RDS DB instances in the same AZ to reduce network latency. Cross-AZ deployment may increase network latency.

Parameter	Description
Instance Name	Name of the DDM instance, which: • Cannot be left blank. • Must start with a letter. • Must be 4 to 64 characters long. • Can contain only letters, digits, and hyphens (-).
Instance Class	Class of the DDM instance. You can select **General-enhanced** or **Kunpeng general computing-plus**. **NOTE** Estimate compute and storage requirements of your application and select an appropriate instance class based on your service type and scale so that the DDM instance you will buy can better meet your needs. The instance class includes vCPUs and memory.
Instance Nodes	Number of nodes in the DDM instance. Up to 32 nodes are supported.
VPC	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. Click **View VPC** to show more details and security group rules. **NOTE** The DDM instance should be in the same VPC as the required RDS DB instance. To ensure network connectivity, the DDM instance you purchased must be in the same VPC as your applications and RDS DB instances.
Subnet	Name and IP address range of the subnet
Security Group	Select an existing security group. You are advised to select the same security group for your DDM instance, application, and RDS MySQL DB instance so that they can communicate with each other. If different security groups are selected, add security group access rules to enable such network access.
Parameter Template	Select an existing parameter template. You can also click **View Parameter Template** to set parameters on the displayed page.
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 4 After the configuration is complete, click **Next** at the bottom of the page.

Step 5 Confirm the configuration information and perform subsequent operations based on the billing mode you select:

- For pay-per-use, click **Submit**.
- For yearly/monthly, click **Pay Now**.

----End

5 Step 4: Create a Schema

You can create a schema in two ways: on the **Instances** page or on the **Schemas** page. This section uses the DDM instance page as an example to describe how to create a schema.

Figure 5-1 Instances page

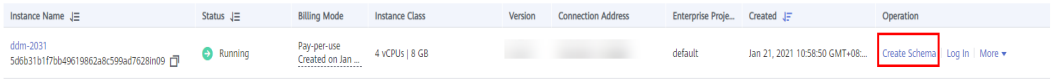
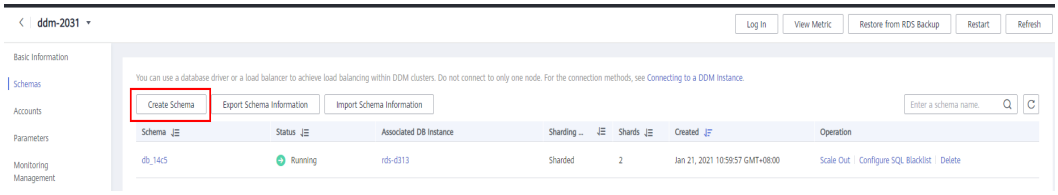


Figure 5-2 Schemas page

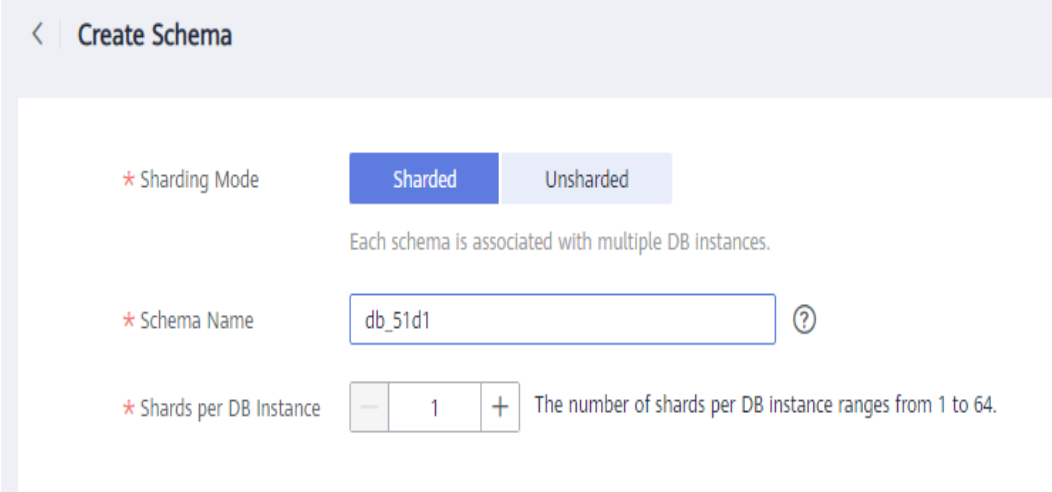


Procedure

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, select the number of shards per DB instance, and click **Next: Select DB Instance**.

Figure 5-3 Creating a schema



NOTE

Sharding mode:

- Sharded: One schema corresponds to multiple DB instances.
- Unsharded: One schema corresponds only to one DB instance, and only one database shard is created for that instance.

The schema name contains 2 to 24 characters and must start with a letter. Only letters, digits, and underscores (_) are allowed.

The shards per DB instance ranges from 1 to 64.

Step 3 On the **RDS DB Instances** tab page, select the required RDS DB instances. You can choose to configure the instances as the unsharded table storage nodes. Click **Preview**.

Step 4 On the displayed page, enter the administrator password and click **Finish**.

----End

6 Step 5: 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 6-1 Required parameters

Parameter	Description
Name	Account name. The name: • Must start with a letter. • Is case-insensitive. • Must be 6 to 32 characters long. • Contains only letters, digits, and underscores (_).
Password	Password of the account. The password: • Can contain 8 to 32 characters. • Must contain at least three of the following character types: letters, digits, spaces, and special characters `~!@#$%^&*()-_=+\\|[{}];:'\"<.>/? • 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.

Parameter	Description
Permissions	The value can be **Read/Write** and **Read-only**. • **Basic Permissions**: **CREATE**, **DROP**, **ALTER**, **INDEX**, **INSERT**, **DELETE**, **UPDATE**, and **SELECT** • **Extended Permissions**: **Table query**, **Table delete**, and **Table update** • When configuring permissions: Select basic permissions based on your needs. When you select a basic permission, the corresponding extended permissions are selected automatically. Not each basic permission corresponds to an extended permission. The extended permissions for each basic permission are as follows: – Table query corresponds to SELECT. – Table delete corresponds to DELETE. – Table update corresponds to UPDATE.
Description	Description of the account, which cannot exceed 256 characters.

Step 4 Click **OK**.

----End

7 Step 6: Connect to the DDM Instance or Schema

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

This section describes how to connect to a DDM instance or a schema.

Preparations

Before connecting to your DDM instance or schema, you have to obtain the connection address of your DDM instance or schema.

Obtaining the Instance Connection Address

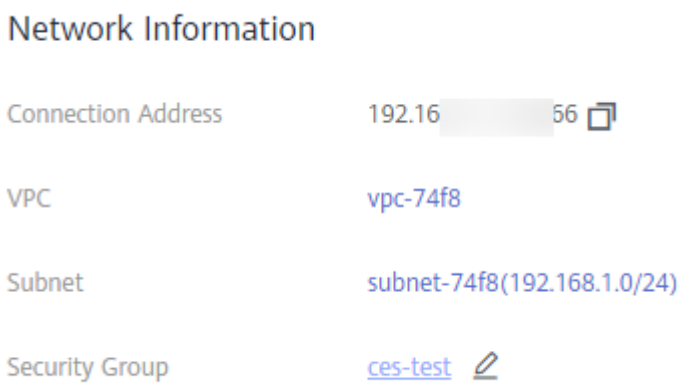
Step 1 Log in to the management console.

Step 2 Click **Service List** and choose **Database** > **Distributed Database Middleware**.

Step 3 In the navigation pane, choose **Instances**. In the instance list, locate the required instance and click its name.

Step 4 In the **Network Information** area, view the connection address.

Figure 7-1 Connection address



NOTE

If you enter an incorrect password too many times when attempting to access your DDM instance, the system will be locked for 20 minutes.

----End

Obtaining the Schema Connection Address

Step 1 Log in to the management console.

Step 2 Choose **Service List** > **Database** > **Distributed Database Middleware**.

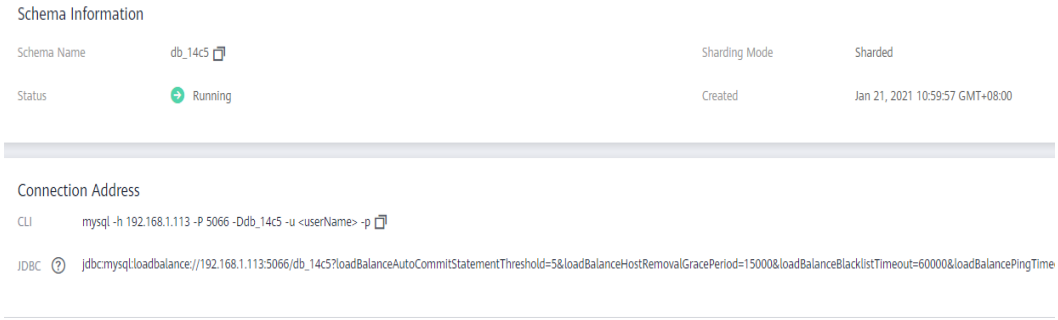
Step 3 In the navigation pane, choose **Instances**. In the instance list, locate the required DDM instance and click its name.

Step 4 In the navigation pane, choose **Schemas**.

Step 5 In the schema list, locate the required schema and click its name.

Step 6 At the **Connection Address** area, view the CLI and JDBC connection addresses.

Figure 7-2 Schema connection address



NOTE

If you enter an incorrect password for five times or more when attempting to access your DDM instance, the system will be locked for 20 minutes.

----End

Connection Methods

For details about method 1, see **Using Navicat to Connect to a DDM Instance**.

For details about method 2, see **Using the MySQL CLI to Connect to a Schema**.

For details about method 3, see **Using a JDBC Driver to Connect to a Schema**.

For details about method 4, see **Using the Console to Connect to a DDM Instance**.

NOTE

- Before you connect to a DDM instance, configure its information on the required tool.
- For security purposes, use an ECS in the same VPC as the target DDM instance.
- Ensure that a MySQL client has been installed on the required Elastic Cloud Server (ECS) or the MySQL connection driver has been configured.

Using Navicat to Connect to a DDM Instance

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

Step 2 In the **Instance Information** area, click **Bind** and select an EIP you have bought.

Step 3 In the left pane, 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 required 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 and password).

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 connect to 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 Connect 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]
```

Table 7-1 Parameter description

Example Parameter	Description	Example Value
DDM_SERVER_ADDRESS	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

Example Parameter	Description	Example Value
DDM_DBNAME	(Optional) Name of the target schema in the DDM instance	-
default-character-set=utf8	(Optional) UTF-8 character set Configure this parameter if garbled characters are displayed during parsing due to inconsistency between MySQL connection code and actually used code.	-

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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owners.

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

mysql>
```

----End

Using a JDBC Driver to Connect to a Schema

This section uses the SQL query statement as an example to describe how to connect to a DDM instance.

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

- **loadBalanceAutoCommitStatementThreshold** and **retriesAllDown parameters** 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

Using the Console to Connect to a DDM Instance

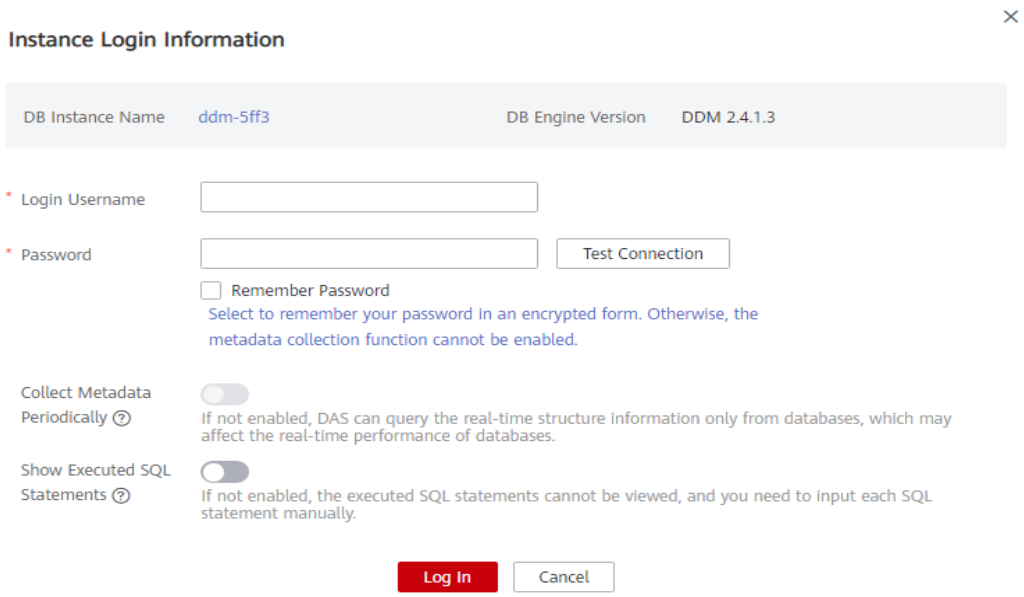
Step 1 Log in to the DDM console.

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 7-3 Login page



Step 4 On the displayed page, enter the account created in **Step 5: Create a 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
2020-11-17	This issue is the fourth official release. Getting Started contents are modified and methods of connecting to DDM instances or schemas are added.
2020-10-20	This issue is the third official release. Updated the information about how to use DDM and how to connect to a DDM instance.
2020-08-07	This issue is the second official release. Optimized information about DDM instance purchase.
2020-04-30	This issue is the first official release.

