

RDS for MariaDB

FAQs

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1 Product Consulting

1.1 Is There Anything Special I Need to Note When Using RDS for MariaDB?

1. DB instance operating systems (OSs) are invisible to you. Your applications can access a database only through an IP address and a port.
2. The backups stored in Object Storage Service (OBS) and the Elastic Cloud Server (ECS) used by RDS for MariaDB are invisible to you. They are only visible in the RDS backend management system.
3. Before viewing the DB instance list, ensure that the region is the same as the region where the DB instance is purchased.
4. After creating RDS DB instances, you do not need to perform basic O&M operations, such as enabling HA and installing security patches. However, you must pay attention to:
 - a. Whether the CPU, input/output operations per second (IOPS), and space of the RDS DB instance are sufficient. If any of these becomes insufficient, change the CPU/Memory or scale up the DB instance.
 - b. Whether the performance of the RDS DB instances is adequate, a large number of slow query SQL statements exist, SQL statements need to be optimized, or any indexes are redundant or missing.

1.2 Will My RDS for MariaDB Instances Be Affected by Other Users' Instances?

No. Your RDS DB instances and resources are isolated from other users' DB instances.

1.3 Will Different RDS for MariaDB Instances Share CPU and Memory Resources?

Yes, that depends on the instance class.

- **General-purpose:**
CPU resources are shared with other general-purpose DB instances on the same physical machine. CPU usage is maximized through resource overcommitment. This instance class is a cost-effective option and suitable for scenarios where performance stability is not critical.
- **Dedicated:**
The instance has dedicated CPU and memory resources to ensure stable performance. The performance of a dedicated instance is never affected by other instances on the same physical machine. This instance class is good when performance stability is important.

1.4 How Long Does It Take to Create an RDS Instance?

- It takes 5 to 7 minutes to create a single-node or primary/standby instance.
- Creating a read replica that is in the same AZ as the primary or standby instance takes about 15 minutes. In other cases, the time required for creating a read replica depends on how much data there is in the primary instance. More data means longer creation.

If creating an instance takes much more time than described above, there may be problems during the creation. In this case, contact customer service by [submitting a service ticket](#).

1.5 What Can I Do About Slow Responses of Websites When They Use RDS for MariaDB?

To solve this problem:

- Check the performance of RDS DB instances on the RDS console.
- Compare the database connection statuses of local databases and RDS DB instances. This problem depends on web applications.

1.6 Can Multiple ECSs Connect to the Same RDS for MariaDB Instance?

Multiple ECSs can connect to the same RDS DB instance as long as the capability limits of a database are not exceeded.

1.7 What Is the Availability of RDS for MariaDB Instances?

Calculation formula for RDS DB instance availability:

DB instance availability = (1 – Failure duration/Total service duration) × 100%

1.8 Does RDS Support Cross-AZ High Availability?

Yes. When you [buy a DB instance](#), you can select **Primary/Standby** for **DB Instance Type** and then select different AZs for **Primary AZ** and **Standby AZ**.

NOTE

RDS does not support 3-AZ deployment.

An AZ is a physical region where resources have independent power supplies and networks. AZs are physically isolated but interconnected through an internal network. You can deploy your instance across AZs in some regions.

To achieve higher reliability, if you deploy the primary and standby instances in the same AZ, RDS will automatically deploy the primary and standby instances in different physical servers. If you attempt to deploy your primary and standby instances in the same AZ in a Dedicated Computing Cluster (DCC) and there is only one physical server available, the creation will fail.

RDS allows you to deploy primary/standby DB instances in an AZ or across AZs. You can determine whether the standby AZ is the same as the primary AZ.

- If they are different (default setting), the primary and standby instances are deployed in different AZs to ensure failover support and high availability.
- If they are the same, the primary and standby instances are deployed in the same AZ. If an AZ failure occurs, high availability cannot be ensured.

1.9 Is RDS for MariaDB Compatible with RDS for MySQL?

MariaDB is a branch of the MySQL source code. It is maintained by the open-source community and uses GPL licensing. One of the reasons for developing MariaDB is that Oracle acquired MySQL, so there is a chance that MySQL could become closed source. The community developed MariaDB to protect against this risk. MariaDB is compatible with MySQL for the most part. It was designed to be a drop-in replacement for MySQL, including the APIs and commands. There is no difference for front-end applications (such as PHP, Perl, Python, Java, .NET, MyODBC, Ruby, and MySQL C connector). As for the storage engine, MariaDB uses XtraDB to replace the InnoDB of MySQL. XtraDB is fully compatible with InnoDB and InnoDB tables can be converted into XtraDB tables by default.

Although MariaDB is a branch of MySQL, some changes have been made to MariaDB. Common applications that used MySQL databases can normally switch to MariaDB databases for data additions, deletions, modifications, or queries. But MariaDB is different from MySQL in terms of some new features. To ensure that MariaDB fits your application perfectly, a proof of concept (POC) is required.

1.10 Can I Use an Encrypted Password to Log In to an RDS for MariaDB Instance?

No. When you log in to an RDS instance, use the password set on the console for authentication. Encrypted password authentication is not supported.

1.11 What Are the Differences Between Floating and Private IP Addresses of RDS for MariaDB Instances?

Definitions of the Floating IP Address and Private IP Address

After an RDS for MariaDB instance is created, the system assigns the instance a floating IP address, which is used by external systems to connect to the instance over a private network.

The system also assigns a private IP address to each database node for internal network communication (two private IP addresses for a primary/standby instance, one for a single-node instance, and one for a read replica). Private IP addresses cannot be accessed by external systems.

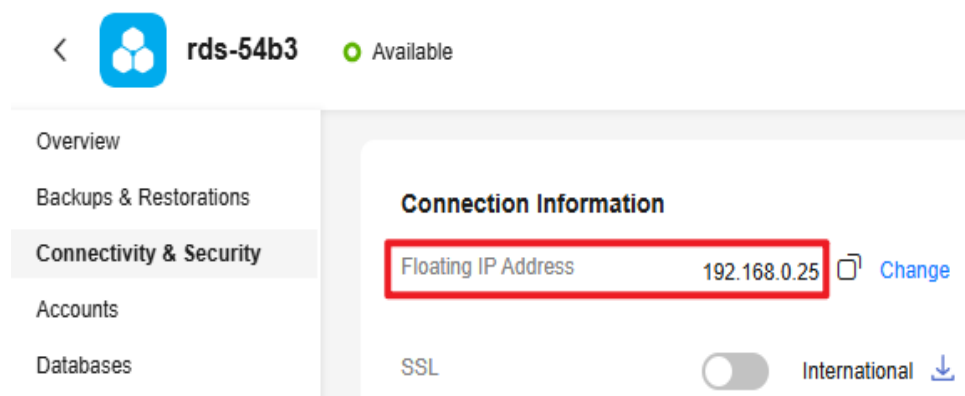
For more information, see [What Are the Differences Between EIPs, Private IP Addresses, and Virtual IP Addresses?](#)

Querying the Floating and Private IP Addresses of an RDS for MariaDB Instance

- Floating IP address

On the RDS console, click the name of a DB instance to go to the **Overview** page. In the navigation pane on the left, choose **Connectivity & Security** to check the floating IP address of the instance.

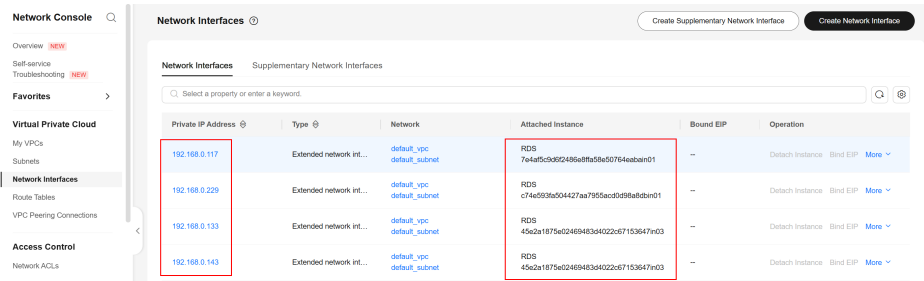
Figure 1-1 Floating IP address



- Private IP address

Log in to the management console and choose **Networking > Virtual Private Cloud**. In the navigation pane on the left, choose **Network Interfaces** to check the private IP addresses of the RDS instance.

Figure 1-2 Checking the private IP addresses



1.12 What Can I Do If I Can't Find My RDS Resources?

Symptom

After I logged in to the management console, I could not find my purchased RDS resources.

Possible Causes

- Your purchased resources are not in the selected region.
- Your purchased resources are not under the selected service.

Solution 1

1. [Log in to the management console.](#)
2. In the upper part of the page, switch to the region that your RDS resources belong to.

Figure 1-3 Changing a region




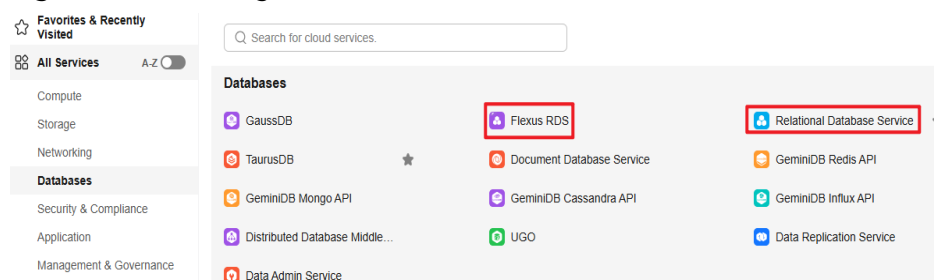
3. Click  in the upper left corner of the page and choose **Databases > Relational Database Service** to go to the service details page.

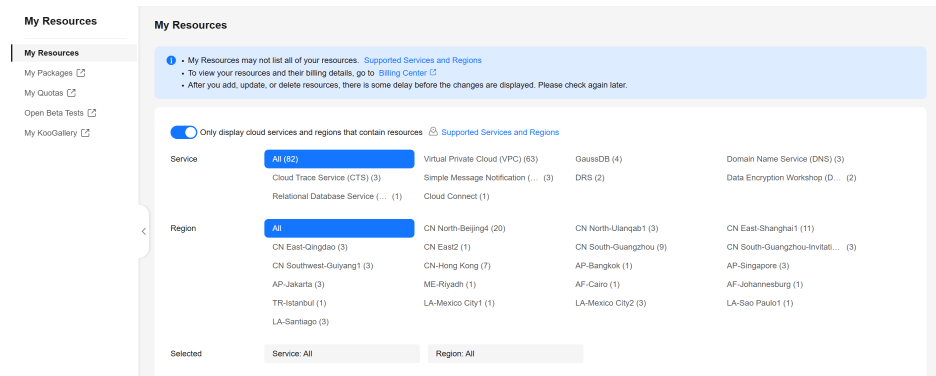
Figure 1-4 Selecting a service



Solution 2

1. [Go to the My Resources page.](#)
1. Select the correct service and region to view the purchased resources.

Figure 1-5 My Resources



2 Resource Freezing, Release, Stopping, Deletion, and Unsubscription

Why Are My RDS for MariaDB Resources Released?

If your subscriptions have expired and not renewed, or you are in arrears due to an insufficient balance, your resources enter a grace period. If the renewal is still not completed or the outstanding amount is not paid off when the grace period ends, the resources enter a retention period, during which the resources will be unavailable. If the renewal is still not completed or the outstanding amount is still not paid off when the retention period ends, the stored data will be deleted and the cloud service resources will be released. For details, see [Service Suspension and Resource Release](#).

Why Are My RDS for MariaDB Resources Frozen?

Your resources may be frozen for a variety of reasons. The most common reason is that you are in arrears.

Can I Still Back Up Data If My DB Instance Is Frozen?

No. If your RDS instance is frozen due to arrears, you need to unfreeze the instance first.

How Do I Unfreeze My Resources?

If your resources are frozen due to arrears, to unfreeze your resources, you can renew your resources or top up your account. RDS for MariaDB instances frozen due to arrears can be renewed, released, or deleted. Yearly/Monthly instances that have expired cannot be unsubscribed from, but those that have not expired can.

What Happens When My Resources Are Frozen, Unfrozen, or Released?

- After your resources are frozen:
 - They cannot be accessed, causing downtime. For example, if your RDS instance is frozen, it cannot be connected to.
 - If they are yearly/monthly resources, no changes can be made to them.

- They can be unsubscribed from or deleted manually.
- After your resources are unfrozen, you can connect to them again.
- If your resources are released, your instances will be deleted. Before the deletion, the system determines whether to **move the instances to the recycle bin** based on the recycling policy you specified.

How Do I Renew My Resources?

After a yearly/monthly instance expires, you can renew it on the [Renewals](#) page. For details, see [Renewal Management](#).

Can My Resources Be Recovered After They Are Released or Unsubscribed From?

If your instance is moved to the recycle bin after being deleted and is within the retention period, you can **rebuild** it from the recycle bin. Otherwise, data cannot be restored.

Before unsubscribing from a resource, confirm the resource information carefully. If you have unsubscribed from a resource by mistake, you are advised to purchase a new one.

How Do I Delete an RDS for MariaDB Instance?

A DB instance cannot be deleted if any operation is being performed on it. For example, the instance is being created, rebooted, or restored, or its instance class is being changed. You can delete the instance only after the operation is complete. For details, see [Deleting a Pay-per-Use DB Instance or Read Replica](#).

3 Resource and Disk Management

3.1 Which Items Occupy the Storage Space of My RDS Instance?

Both your regular data (backup data not included) and the data required for the operation of your DB instance (such as system database data, rollback logs, redo logs, and indexes) take up the storage space on your DB instance. The storage space includes the file system overhead required for inode, reserved blocks, and database operations. Binlogs generated by RDS instances also occupy storage space.

These files ensure the stability of RDS DB instances.

3.2 How Much Storage Space Is Required for DDL Operations?

Data Definition Language (DDL) operations may increase storage usage sharply. To ensure that services are running properly, do not perform DDL operations during peak hours. If DDL operations are required, ensure that storage space is at least twice the tablespace size plus 10 GB. For example, if your tablespace is 500 GB, ensure that storage space is at least 1,010 GB (500 GB x 2 + 10 GB).

4 Database Connection

4.1 What Do I Do If There Are Too Many Database Connections?

The number of database connections indicates the number of applications that can be simultaneously connected to a database, and is irrelevant to the maximum number of users allowed by your applications or websites.

If there is an excessive number of database connections, applications may fail to be connected, and the full and incremental backups may fail, affecting services.

Fault Locating

1. Check whether applications are connected, optimize the connections, and release unnecessary connections.
2. Check the specifications and scale them up if needed.
3. On the Cloud Eye console, view metrics of your DB instance to identify performance issues and set alarms for metric thresholds. Cloud Eye monitors metrics of different categories, including CPU, memory, storage, and connections. For details, see the *Cloud Eye User Guide*.

Solution

1. Connect to a DB instance through a private network. Using a private network prevents congestion caused by insufficient bandwidth.
For details, see [Connecting to an RDS for MariaDB Instance Through a Private Network](#).
2. On the management console, set the parameter **innodb_adaptive_hash_index** to **off** to reduce lock wait time. For operation details, see [Modifying Parameters](#).
3. Optimize slow queries.

4.2 What Should I Do If an ECS Cannot Connect to an RDS for MariaDB Instance over a Private Network?

Perform the following steps to identify the problem:

Step 1 Check whether the ECS and RDS for MariaDB instance are located in the same VPC.

- If they are in the same VPC, go to [Step 2](#).
- If they are in different VPCs, create an ECS in the VPC in which the RDS for MariaDB instance is located.

Step 2 Check whether the security group rules of the RDS instance are appropriate.

For details, see [Configuring a Security Group Rule](#).

Step 3 On the ECS, check whether the RDS for MariaDB instance port can be connected.

The default port of RDS for MariaDB is **3306**.

```
curl -kv Floating_IP_address:Port
```

- If the ECS can connect to the DB instance port, no further action is required.
- If the ECS still cannot connect to the port, contact technical support.

----End

4.3 What Should I Do If My RDS for MariaDB Instance Fails to Be Connected Due to Database Client Problems?

Troubleshoot RDS for MariaDB connection failures caused by a client problem by checking the following items:

1. ECS Security Policy

In Windows, check whether the RDS for MariaDB instance port is enabled in the Windows security policy. In Linux, run **iptables** to check whether the RDS for MariaDB instance port is enabled in firewall settings.

2. Application Configuration

Check whether the connection address, port parameter configuration, and JDBC connection parameter configuration are correct.

3. Username or Password

Check whether the username or password is correct if an error similar to the following occurs during database connection:

- [Warning] Access denied for user 'username'@'yourIp' (using password: NO)
- [Warning] Access denied for user 'username'@'yourIp' (using password: YES)

 NOTE

If the problem persists, contact post-sales technical support.

4.4 What Should I Do If an RDS for MariaDB Database Problem Causes a Connection Failure?

Check whether any of the following problems occurred on the RDS for MariaDB instance.

1. The DB instance is not properly connected.

Solution: Check the connection. If you connect to the RDS DB instance through a private network, the ECS and DB instance must be in the same VPC and the DB instance can be accessed only through an ECS in the same VPC. If you connect to an RDS DB instance through a public network, the ECS and DB instance can be in different VPCs.

2. The maximum number of connections has been reached.

Solution: Use RDS for MariaDB resource monitoring to check if the CPU usage and the number of connections are within the allowed ranges. If either of them has reached the maximum, reboot, disconnect, or upgrade the specifications of the RDS for MariaDB instance.

3. The DB instance is abnormal. For example, the DB instance fails to be rebooted, the system is faulty, or the instance or any table is locked.

Solution: Reboot the DB instance to see if the problem is resolved. If the problem persists, contact post-sales technical support.

4.5 Do Applications Need to Support Automatic Reconnections to RDS for MariaDB Instances?

It is recommended that your applications support automatic reconnections to DB instances. After an instance reboot, your applications will automatically reconnect to the instance to increase service availability and continuity.

To reduce resource consumption and improve performance, configure your applications to connect to an instance using a persistent connection.

4.6 Why Can't I Ping My EIP After It Is Bound to an RDS for MariaDB Instance?

Fault Location

1. Check security group rules.
2. Check network ACLs.
3. Ping the affected EIP from another ECS in the same region.

Solution



1. Check security group rules.
 - a. [Log in to the management console](#).
 - b. Click  in the upper left corner and select a region.
 - c. Click  in the upper left corner of the page and choose **Databases > Relational Database Service**.
 - d. On the **Instances** page, click the target DB instance name to go to the **Overview** page.
 - e. Under **Security Group**, click the security group name.
 - f. Check whether the ECS NIC security group allows the inbound ICMP traffic.

Table 4-1 Security group rules

Direction	Action	Type	Protocol & Port	Source/Destination	Description
Inbound	Allow	IPv4	ICMP: All	Source: 0.0.0.0/0	This rule allows ICMP traffic to RDS instances in this security group over any port to verify network connectivity using the ping command.

2. Check network ACLs.
 - a. Check the network ACL status.
 - b. Check whether the NIC to which the EIP bound belongs to the subnet associated with the network ACL.
 - c. If the network ACL is enabled, add an ICMP rule to allow traffic.

 **NOTE**

The default network ACL rule denies all incoming and outgoing packets. If the network ACL is disabled, the default rule still takes effect.

3. Ping the affected EIP from another ECS in the same region.

Use another ECS in the same region to ping the EIP. If the EIP can be pinged, the virtual network is normal. Contact technical support.

4.7 Can I Access an RDS Instance over an Intranet Across Regions?

By default, RDS instances cannot be accessed over an intranet across regions. Cloud services in different regions cannot communicate with each other over an

intranet. You can use EIP, Cloud Connect (CC), or Virtual Private Network (VPN) to connect to RDS instances across regions.

- You can access RDS instances across regions using EIP. For details, see [Using MySQL CLI to Connect to an Instance Through a Public Network](#).
- Cloud Connect allows you to connect two VPCs in the same account or in different accounts even if they are in different regions. For details, see [Using a Cloud Connection to Connect VPCs in the Same Account But Different Regions](#).
- VPN uses an encrypted tunnel to connect VPCs in different regions and sends traffic over the Internet. It is inexpensive, easy to configure, and easy to use. However, the quality of VPN connections depends on the quality of your Internet connection. For details, see [Connecting an On-Premises Data Center to a VPC Through a VPN](#).

4.8 Why Did the New Password Not Take Effect After I Reset the Administrator Password of My RDS Instance?

Possible Causes

You may have restored from a backup before you reset the administrator password.

Locating Method

Check whether the DB instance was restored after you reset the administrator password.

Solution

Log in to the RDS console and reset the administrator password again. For details, see [Resetting the Administrator Password](#).

4.9 Can I Access RDS for MariaDB Standby Instances?

No. You can directly access primary DB instances and read replicas. Standby DB instances are not visible to users and therefore you cannot access them directly.

RDS supports primary/standby failover and switchover. Data is synchronized between the primary and standby instances in real time.

4.10 Will My Access Be Restricted by Bandwidth When I Connect to My RDS Instance from an ECS over a Private Network?

No.

5 Database Migration

5.1 What Types of DB Engines Does RDS for MariaDB Support for Importing Data?

- Exporting or importing data between DB engines of the same type is called homogeneous database export or import.
- Exporting or importing data between DB engines of different types is called heterogeneous database export or import. For example, import data from Oracle to DB engines supported by RDS.

Generally, data cannot be exported or imported between heterogeneous databases due to the different data formats involved. However, if the data formats are compatible, table data can, in theory, be migrated between them.

Third-party software is usually required for data replication to export and import between heterogeneous databases.

6 Database Permissions

6.1 Why Does the Root User of My RDS for MariaDB Instance Not Have the Super Permissions?

RDS does not provide the super permissions for the **root** user. The super permissions allow you to execute management commands, such as **reset master**, **set global**, **kill *thread_ID***, and **reset slave**. These operations may cause primary/standby replication errors.

If you need to perform operations that require super permissions, RDS provides alternative methods.

- Scenario 1: If you cannot run the following command on an RDS instance to modify parameter values, you can modify parameter values through the RDS console.

set global parameter name=*Parameter value*;

If the script contains the **set global** command, delete the **set global** command and modify parameter values on the RDS console.

- Scenario 2: An error is reported after you run the following command because the **root** user does not have the super permissions. To solve this problem, delete **definer='root'** from the command.

create definer='root'@'%' trigger(procedure)...

6.2 What Are the Differences Between RDS ManageAccess and DAS Permissions?

Permission	Description
RDS ManageAccess	Permissions used to manage RDS DB instances

Permission	Description
DAS permissions	Permissions used on Data Admin Service (DAS). DAS enables you to manage DB instances on a web-based console, simplifying database management and improving working efficiency.

6.3 How Do I View Authorized Databases After a Local Client Is Connected to an RDS for MariaDB Instance?

After connecting to an instance using a local client, run the following command to grant permissions to view databases. In the command, *ip* indicates the local IP address.

```
show grants for root@'ip';
```

```
show grants for root@'%';
```

6.4 Can Multiple Users Log In to an RDS for MariaDB Instance Through DAS at the Same Time? Will the Accounts Be Locked If I Enter Wrong Passwords Several Times in a Row?

Multiple users can log in to a DB Instance through DAS at the same time. The passwords will not be locked after multiple failed login attempts.

If you forget the password of your database account when using RDS, you can reset the password. On the **Instances** page of the RDS console, locate the target DB instance and choose **More** > **Reset Password** in the **Operation** column.

7 Database Storage

7.1 What Types of Storage Does RDS Use?


RDS uses Elastic Volume Service (EVS) disks for storage. For details, see [Elastic Volume Service Service Overview](#).

RDS backup data is stored in OBS and does not occupy the storage space of your instance. For details on the instance storage configuration, see [Object Storage Service User Guide](#).

7.2 How Do I View the Storage Usage of My RDS for MariaDB Instance?

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

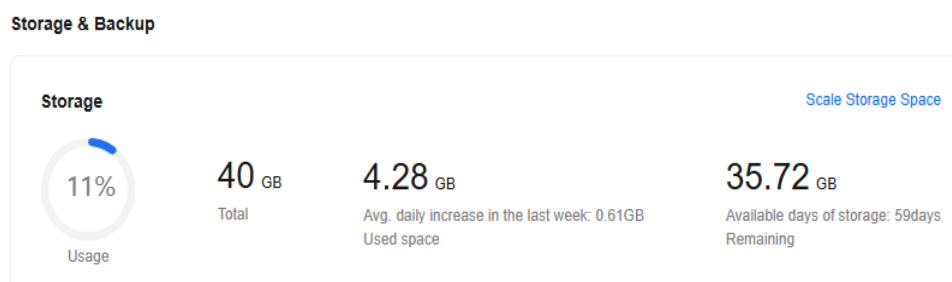
Step 2 Click  in the upper left corner and select a region.

Step 3 Click  in the upper left corner of the page and choose **Databases > Relational Database Service**.

Step 4 On the **Instances** page, click the target instance name.

Step 5 On the **Overview** page, view the storage space usage in the **Storage & Backup** area.

Figure 7-1 Storage space



----End

8 Database Usage

8.1 How Do I Use DAS to Query SQL Statements?

DAS is a professional database management tool with a visual interface. You can enable SQL Explorer to query related SQL statements.

Procedure



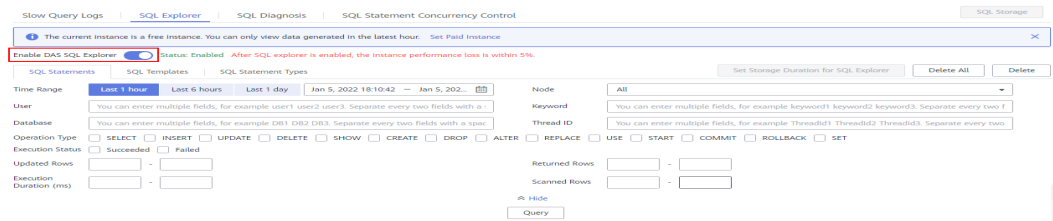
- Step 1** [Log in to the management console.](#)
- Step 2** Click  in the upper left corner and select a region.
- Step 3** Click  in the upper left corner of the page and choose **Databases > Relational Database Service**.
- Step 4** On the **Instances** page, locate the DB instance and click **Log In** in the **Operation** column.
- Step 5** On the displayed login page, enter the correct username and password and click **Log In**.
- Step 6** In the navigation pane, choose **Cloud DBA (Intelligent O&M)** to go to the **Instance Overview** page.
- Step 7** Locate the instance you want to view and click **Details**.
- Step 8** Choose **SQL > SQL Explorer** to view full SQL details of the instance.
- Step 9** On the **SQL Statements** tab page, click **Enable DAS SQL Explorer**. Query the SQL statements executed by the current instance by time range, user, keyword, operation type, or database.

Figure 8-1 Enabling SQL Explorer



Step 10 Filter operation types by referring to [Table 8-1](#) and click **Export** to export the corresponding SQL statements.

Table 8-1 Common SQL statement types

Type	Keyword
DDL	CREATE, DROP, ALTER
DML	INSERT, UPDATE, DELETE, SELECT
DCL	GRANT, REVOKE

NOTE

A maximum of 10,000 SQL statements can be displayed. If you need to view more, click **Export**.

Up to 100,000 records can be exported.

----End

8.2 How Do I View Session IDs and Login and Logout Time of an RDS for MariaDB Database?

- View database login and logout time in SQL audit logs. For details about how to enable SQL audit, see [Enabling SQL Audit](#).
- To view sessions, run the `show processlist` command in the database.

8.3 What Should I Do If Garbled Characters Are Displayed After SQL Query Results Are Exported to an Excel File for My RDS for MariaDB Instance?

The default code is utf8. You need to convert the default code to Unicode in the exported Excel file.


8.4 Does the OPTIMIZE TABLE Operation Lock Tables on an RDS for MariaDB Instance?


When the OPTIMIZE TABLE operation is performed on an RDS DB instance, the tables are locked only for a short period of time. During the table locking period, DML operations can be performed but DDL operations cannot. DML will recreate tables, which consumes CPU and disk resources. If there are a large number of concurrent DML operations, the table will be locked for longer. To avoid impacting services, perform the OPTIMIZE TABLE operation during off-peak hours.

9 Backup and Restoration

9.1 How Do I View My Backup Space Usage?

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

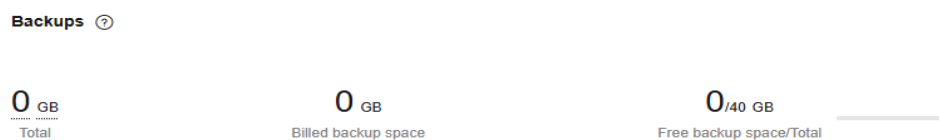
Step 2 Click  in the upper left corner and select a region.

Step 3 Click  in the upper left corner of the page and choose **Databases > Relational Database Service.**

Step 4 On the **Instances** page, click the target instance name.

Step 5 On the **Overview** page, view the backup space usage in the **Backups** area.

Figure 9-1 Backups



NOTE

The storage spaces of primary and standby instances are the same because they both need to hold the same amount of data. Free backup storage equal to your purchased storage space is also provided. If free backup space is used up, the additional space will be billed. You need to configure an automated backup policy before using the backup space.

----End

9.2 How Are RDS for MariaDB Backups Billed?

All the RDS full and binlog backups are stored on OBS without occupying the storage of your DB instances. RDS provides free backup space of the same size as your purchased storage.

The lifecycle of automated backups is the same as that of the DB instance. If you delete a DB instance, its automated backups are also deleted, but manual backups are not. For details, see [Deleting a Manual Backup](#).

For example, if you purchase a DB instance with 200 GB of storage, you can get an additional 200 GB of backup space and will only be billed for backups in excess of 200 GB. The first 200 GB of backup data is free. When the free backup space is used up, you will be billed for the additional space on a pay-per-use basis. For pricing details, see [Backup space billing information](#).

NOTICE

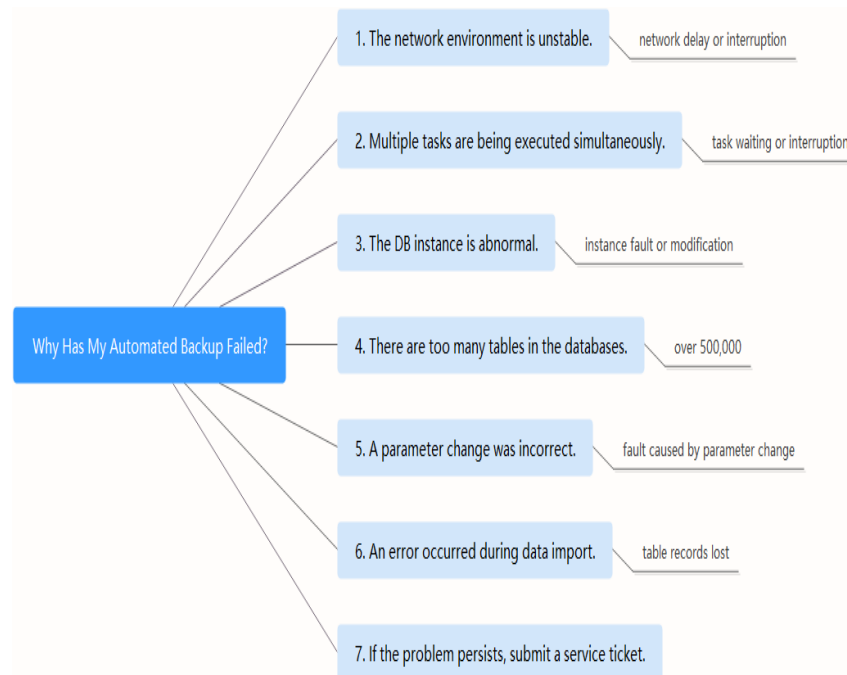
If your storage is frozen, it is no longer billed and the free backup space is also unavailable.

If your DB instance is frozen, no free backup space is available and the original backups generated before the instance is frozen will be billed.

- If you unfreeze the DB instance, the free backup space will be restored.
 - If you delete the frozen DB instance, the existing automated backups will also be deleted. You need to manually delete the existing manual backups. After all the backups are removed, the backup space will no longer be billed.
-

9.3 Why Has Automated Backup of My RDS for MariaDB Instance Failed?

The following figure shows the possible reasons for automated backup failures.

Figure 9-2 Reasons why automated backup fails

- The network environment may be unstable due to problems such as network delay or interruptions.
If RDS detects any of these problems, it triggers another automated backup half an hour later. Alternatively, you can perform a manual backup immediately.
- If multiple tasks are being executed simultaneously, there can be problems such as excessive task wait times or interruptions.
If RDS detects any of these problems, it triggers another automated backup half an hour later. Alternatively, you can perform a manual backup immediately.
- The DB instance is abnormal probably because it is faulty or being modified.
If RDS detects any of these problems, it triggers another automated backup half an hour later. Alternatively, you can perform a manual backup immediately.
- The backup speed depends on how many tables there are in the databases.
If the number of tables exceeds 500,000, the backup will fail.
- A parameter change was incorrect.
If your DB instance becomes faulty after you modify parameters of a parameter template and apply the template to the instance, check whether the modified parameters are set to correct values and whether there are any associated parameters that need to be changed, or reset the parameters to their defaults and reboot the DB instance.
- If the problem persists, [submit a service ticket](#) for assistance.

9.4 Why Is Data Lost or Deleted from My RDS Instance?

RDS does not delete or perform any operations on any user data. If this problem occurs, check if there have been any misoperations and restore the data from backup files, if necessary.

Check for misoperations: If [SQL audit has been enabled](#), you can view data execution records in audit logs.

Restore data using backup files:

- Use the RDS restoration function.
- Import the backup data to RDS through an ECS.

9.5 How Long Does RDS Store Backup Data?

Automated backup data is kept based on the backup retention period you specified. For details, see [Configuring an Automated Backup Policy](#).

There is no limit for the manual backup retention period. You can delete manual backups as needed. For details, see [Deleting a Manual Backup](#).

The backup data is stored in OBS and does not occupy the database storage space.

9.6 How Do I Clear RDS for MariaDB Backup Space?

The RDS for MariaDB backup space stores automated backups, manual backups, and SQL audit logs.

- **Automated full and incremental backups**
Automated backups cannot be manually deleted. You need to change the backup retention period by [configuring a backup policy](#). Backups that have expired will be automatically deleted.
- **Manual full backups**
You can manually delete manual backups. For details, see [Deleting a Manual Backup](#).
- **SQL audit logs**
You can change the retention period. Audit logs that have expired will be automatically deleted. For details, see [Enabling SQL Audit](#).
You can also disable SQL audit and select check box "I acknowledge that after audit log is disabled, all audit logs are deleted."

9.7 Can My RDS Instance Still Be Used in the Backup Window?

A backup window is a user-specified time during which RDS for MariaDB instances are backed up. With these periodic data backups, RDS for MariaDB allows you to restore DB instances to a point in time within the backup retention period.

- During the backup window, you can still use your instance except rebooting it on the console.
- When starting a full backup task, the system first tests connectivity to your instance. If either of the following conditions is met, the test fails and a retry is performed. If the retry fails, the backup task fails.
 - DDL operations are being performed on the DB instance.
 - The backup lock fails to be obtained from the DB instance.

9.8 How Can I Back Up an RDS Instance to an ECS?

You can back up data to an ECS the same way you export SQL statements. The ECS service does not have restrictions on the types of data to be backed up as long as the data complies with local laws and regulations. You can store backup data on an ECS, but using an ECS as the database backup space is not recommended.

You are advised to use RDS [automated backup](#) and [manual backup](#) to back up data to OBS for higher data reliability and service assurance.

9.9 Can I Dump RDS Backups to My OBS Bucket?

No. Backups cannot be directly dumped to your OBS bucket.

You can download full backups or incremental backups to your local PC and dump them to your OBS bucket using OBS Browser+.

10 Read Replicas and Read/Write Splitting

10.1 Why Can't I Purchase Read Replicas on the RDS Console?

Read replicas cannot be purchased separately. A single-node or primary/standby DB instance must be purchased first. A read replica uses an IP address independent from that of the DB instance it is associated with.

For details about RDS for MariaDB read replicas, see [Introduction to Read Replicas](#).

10.2 Can I Change the Replication Mode Between RDS Primary Instances and Read Replicas?

A read replica uses a single-node architecture (without a standby node). Changes to the primary DB instance are also automatically synchronized to all associated read replicas through the native MariaDB replication function. The synchronization is not affected by network latency. Even if a DB instance does not have a primary key ID, its data is synchronized to the associated read replicas.

The replication mode displayed on the RDS console indicates the data synchronization method between primary and standby DB instances. Semi-synchronous (default) and asynchronous are both supported. The semi-synchronous mode is more secure but the asynchronous mode improves performance.

The default synchronization between primary DB instances and read replicas is asynchronous and cannot be changed.

10.3 Does RDS Support Read/Write Splitting?

No. For details, see [Table 10-1](#).

Table 10-1 RDS for MariaDB read/write splitting

Database	Read/ Write Splitting	Database Proxy	Remarks
RDS for MariaDB	Not supporte d	Not supported	N/A

11 Database Monitoring

11.1 Which RDS for MariaDB Instance Metrics Do I Need to Pay Attention To?

You need to pay attention to CPU, memory, and storage space usage.

You can configure the system to report alarms based on service requirements and take measures to handle any reported alarms.

Configuration examples:

- Configure RDS to report alarms to Cloud Eye if its CPU utilization reaches or exceeds a specific value (for example, 90%) multiple times (for example, 3 times) within a set period (for example, 5 minutes).
- Configure RDS to report alarms to Cloud Eye if its memory utilization reaches or exceeds a specific value (for example, 90%) multiple times (for example, 4 times) within a set period (for example, 5 minutes).
- Configure RDS to report alarms to Cloud Eye if its storage utilization reaches or exceeds a specific value (for example, 85%) multiple times (for example, 5 times) within a set period (for example, 5 minutes).

NOTE

For details on Cloud Eye alarm configuration, see "Creating an Alarm Rule" in the *Cloud Eye User Guide*.

Measures:

- If a CPU or memory alarm is reported, you can scale up the vCPUs or memory by changing the DB instance class.
For details, see [Changing a DB Instance Class](#).
- If a storage space usage alarm is reported, you can:
 - Check the storage space consumption to see if any space can be freed up by deleting data from DB instances or by dumping the data to another system.
For details, see [What Should I Do if an RDS Instance Is Abnormal Due to Full Storage Space?](#)

- Scale up the storage space.
For details, see [Scaling Up Storage Space](#).

12 Capacity Expansion and Specification Change

12.1 Why Does My RDS for MariaDB Instance Become Faulty After Its Database Port Is Changed?

Symptom

- The DB instance is in **Faulty** state after the original database port is changed.
- The DB instance cannot be connected using the new database port.

Possible Causes

The submitted database port is occupied.

Procedure

Change the database port to the new port again. For details, see [Changing a Database Port](#).

- If the database port is changed successfully, the previous change failed because the submitted database port was occupied.
- If the original database port still fails to be changed, contact technical support.

12.2 Can I Change the VPC or Subnet that My RDS for MariaDB Instance Belongs To?

No. The VPC and subnet cannot be changed after the instance is created.


However, you can change the VPC or subnet by restoring a full backup to a new DB instance. For details, see [Restoring a DB Instance from a Backup](#).


13 Database Parameter Modification

13.1 Can I Use SQL Commands to Modify Global Parameters of My RDS for MariaDB Instance?

Sorry, you cannot use SQL commands to modify global parameters, but you can modify specific parameters on the RDS console.

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

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

Step 3 Click  in the upper left corner of the page and choose **Databases > Relational Database Service**.

Step 4 On the **Instances** page, click the target DB instance.

Step 5 In the navigation pane on the left, choose **Parameters**.

Step 6 Change the value of the target parameter and click **Save**.

Step 7 In the displayed dialog box, click **OK**.

----End


13.2 How Do I Change the Time Zone of My RDS for MariaDB Instance?


You can change the time zone of an RDS for MariaDB instance only through the RDS console. You can specify a time zone during instance creation and change it after the instance is created, if required.

After the time zone parameter is modified, you need to reconnect to the instance for the modification to take effect.

To change the time zone of an RDS for MariaDB instance, perform the following steps:

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

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

Step 3 Click  in the upper left corner of the page and choose **Databases > Relational Database Service**.

Step 4 On the **Instances** page, click the target DB instance.

Step 5 In the navigation pane on the left, choose **Parameters**.

Step 6 Search for a time zone parameter in the search box, for example, **time_zone**.

Step 7 Select a time zone, and click **Save**.

Step 8 In the displayed dialog box, click **OK**.

For example, to change the time zone to UTC+08:00, select **Asia/Shanghai** from the drop-down list.

----End

Time Zone Parameters

- **system_time_zone**: operating system (OS) time zone. This parameter cannot be changed and it has no impact on the database time zone.
- **time_zone**: database time zone. You can modify this parameter to change the time zone for your DB instance.

14 Network Security

14.1 How Can Secure Data Transmission Be Ensured When I Access an RDS for MariaDB Instance Through an EIP?

When you access a DB instance through an EIP, workload data will be transmitted on the Internet. To prevent any potential data breaches, you are advised to use SSL to encrypt data transmitted on the Internet. For details, see [Configuring an SSL Connection](#). You can also use Direct Connect or VPN to encrypt data transmission.

14.2 How Can I Prevent Untrusted Source IP Addresses from Accessing RDS for MariaDB?

- If you enable public accessibility, your EIP DNS and database port may be vulnerable to hacking. To protect information such as your EIP, DNS, database port, database account, and password, you are advised to set the range of source IP addresses in the RDS security group to ensure that only trusted source IP addresses can access your DB instances.
- To prevent your database password from being cracked, set a strong password and periodically change it.

14.3 How Do I Import the SSL Certificate of an RDS for MariaDB Instance to a Windows or Linux Server?

Importing the Certificate to a Windows Server

1. Click **Start** and choose **Run**. In the displayed **Run** dialog box, enter **MMC** and press **Enter**.
2. On the displayed console, choose **File > Add/Remove Snap-in**.

3. In the left **Available snap-ins** pane of the displayed **Add or Remove Snap-ins** dialog box, select **Certificates** and click **Add**.
4. In the displayed **Certificates snap-in** dialog box, select **Computer account** and click **Next**.
5. In the displayed **Select Computer** dialog box, click **Finish**.
6. In the **Add or Remove Snap-ins** dialog box, click **OK**.
7. On the console, double-click **Certificates**.
8. Right-click **Trusted Root Certification Authorities** and choose **All Tasks > Import**.
9. In the displayed **Certificate Import Wizard** dialog box, click **Next**.
10. Click **Browse** to change the file type to **All Files (*.*)**.
11. Locate the downloaded root certificate ca.pem file and click **Open**. Then, click **Next**.

NOTICE

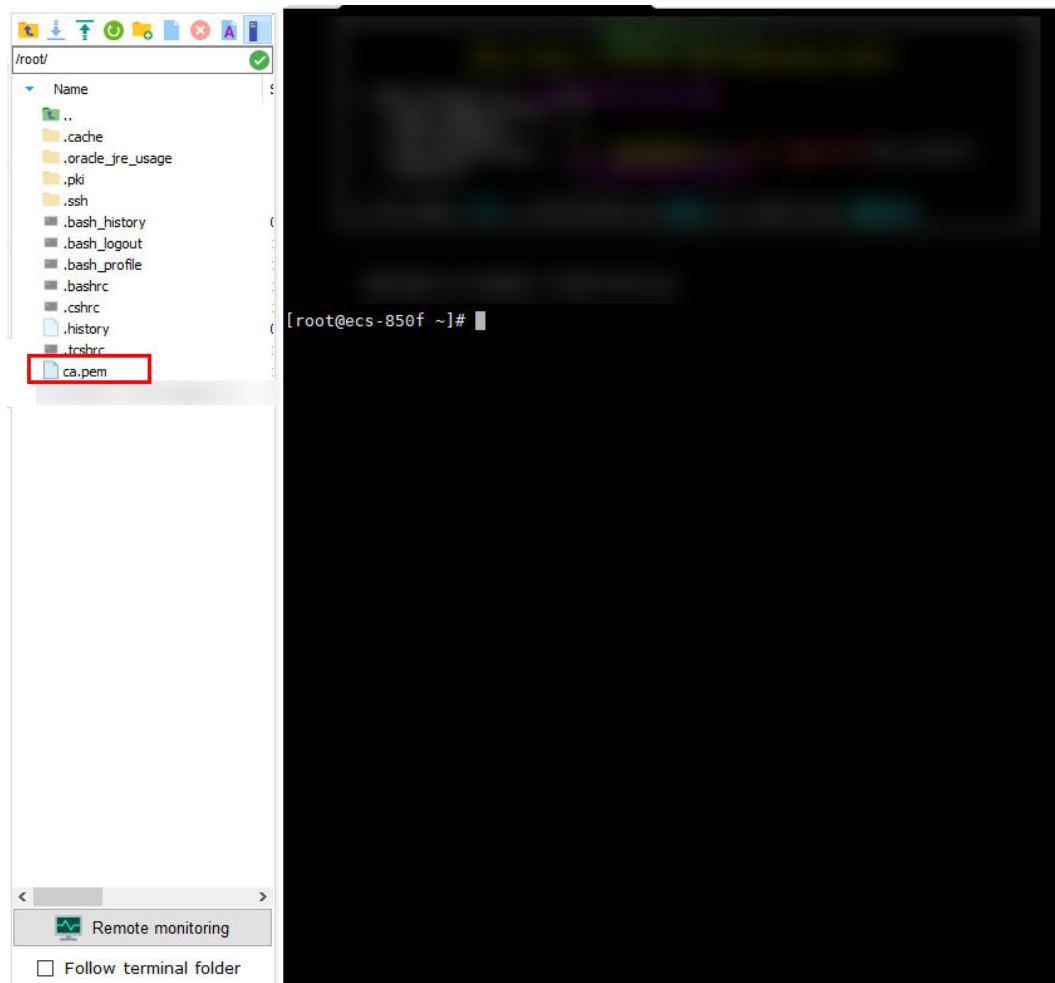
You must change the file type to **All Files (*.*)** because **.pem** is not a standard certificate extension name.

12. Click **Next**.
13. Click **Finish**.
14. Click **OK** to complete the import of the root certificate.

Importing the Certificate to a Linux Server

You can use a connection tool (such as WinSCP or PuTTY) to upload the certificate to any directory on a Linux server.

Example:

Figure 14-1 Importing a certificate

14.4 What Are the Possible Causes for Data Corruption of an RDS for MariaDB Instance?

- Data tampering
Lots of security measures are provided to ensure that only authenticated users have permissions to perform operations on database table records. Database tables can be accessed only through specific database ports.
Verifying package during primary/standby synchronization can prevent data tampering.
- DB instance servers may be powered off suddenly, causing database page corruption and database rebooting failures.
If a primary DB instance becomes faulty, the system switches to the standby DB instance within 1 to 5 minutes to provide services for you. Databases cannot be accessed during a failover. You must configure automatic reconnection between your applications and RDS to make sure that your applications are available after the failover.

14.5 After My RDS for MariaDB Instance Is Deleted, Why Can't the Associated Security Group Be Deleted Immediately?

When creating a DB instance, you must select a security group. If no security group is available or created, RDS allocates a security group to you by default.

After a DB instance is deleted, it is moved to the recycle bin and retained for seven days by default. To modify the retention period, [configure a recycling policy](#).

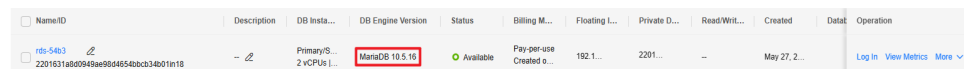
The deleted instance is not removed from the security group immediately until the instance is deleted from the recycle bin. Before deleting a security group, ensure that the security group is not associated with any instance. For details about how to query instances associated with a security group, see [How Do I Know the Instances Associated with a Security Group?](#)

15 Version Upgrade

15.1 How Can I Check the Version of an RDS for MariaDB Instance?

- On the **Instances** page of the RDS console, view the version of the DB instance.

Figure 15-1 Instances



Name/ID	Description	DB Instance	DB Engine Version	Status	Billing M...	Floating L...	Private D...	Read/Writ...	Created	Data	Operation
rds-54b3 2201631a800949ae9846540bcb34001n18		Primary/S... 2 vCPUs ...	MariaDB 10.5.16	Available	Pay-per-use Created o...	192.1...	2201...	--	May 27, 2...		Log In View Metrics More

- On the DAS console, perform the following steps to view the version of the target DB instance:
 - a. Log in to the target DB instance.
 - b. On the top menu bar, choose **SQL Operations > SQL Query**.
 - c. Run **select @@version;** to view the version of the DB instance.

16 Developer-Related APIs and SDKs for RDS

Table 16-1 RDS APIs and SDKs

Category	Reference Document
RDS API	RDS API Reference
RDS Java SDK	SDK Developer Guide
RDS Python SDK	
RDS Go SDK	