



Relational Database Service

Getting Started

Issue 18

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1 Getting Started with RDS for MySQL

1.1 Connecting to a DB Instance

An RDS DB instance can be connected through a private network, the Data Admin Service (DAS) service, or a public network.

Table 1-1 RDS connection methods

Connect Through	IP Address	Scenarios	Description
DAS	No IP address is required. You can log in to the DAS console and use RDS directly.	Data Admin Service (DAS) enables you to manage databases on a web-based console and supports SQL execution, advanced database management, and intelligent O&M, simplifying database management and improving working efficiency and data security. The permissions required for connecting to DB instances through DAS are enabled by default.	<ul style="list-style-type: none">• Easy to use, secure, advanced, and intelligent• Recommended

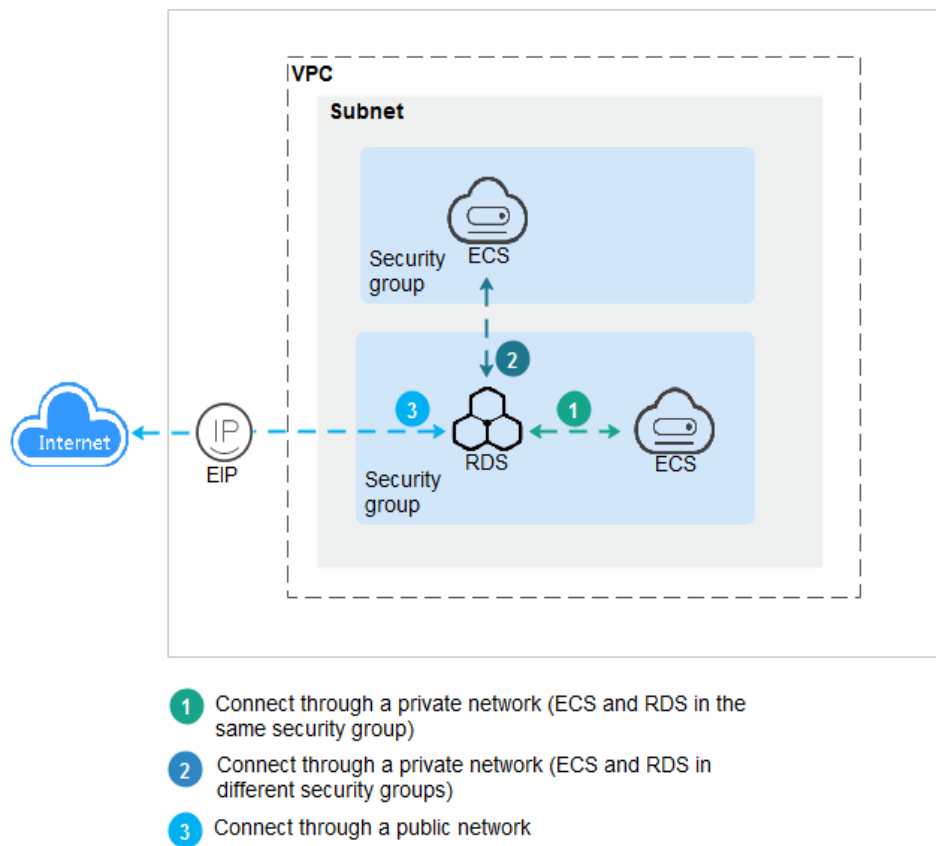
Connect Through	IP Address	Scenarios	Description
Private network	Floating IP	<p>RDS provides a floating IP address by default.</p> <p>When your applications are deployed on an ECS that is in the same region and VPC as RDS, you are advised to use a floating IP address to connect to the RDS DB instance through the ECS.</p>	<ul style="list-style-type: none"> • Secure and excellent performance • Recommended
Public network	EIP	<p>If you cannot access an RDS DB instance through a floating IP address, bind an EIP to the DB instance and connect the DB instance to the ECS through the EIP.</p>	<ul style="list-style-type: none"> • A relatively lower level of security compared to other connection methods • To achieve a higher transmission rate and security level, you are advised to migrate your applications to an ECS that is in the same VPC as your RDS DB instance and use a floating IP address to access the DB instance. • You need to purchase an EIP. For pricing details, see EIP billing details.

NOTE

- VPC: indicates the Virtual Private Cloud.
- ECS: indicates the Elastic Cloud Server.
- You can log in to DB instances using the Data Admin Service (DAS) service or other database clients.
- If the ECS is in the same VPC as your RDS DB instance, you do not need to apply for an EIP.

Figure 1-1 illustrates the connection over a private network or a public network.

Figure 1-1 DB instance connection



Connecting to DB Instances Running Other DB Engines

- [Connecting to a PostgreSQL DB Instance](#)
- [Connecting to a Microsoft SQL Server DB Instance](#)

1.2 Connecting to a MySQL DB Instance Through DAS

1.2.1 Overview

Scenarios

With DAS, you can perform SQL executions, advanced database management, and intelligent O&M on a web-based console, which simplifies database management and improves working efficiency and data security. The permission of connecting DB instances through DAS is enabled by default.

This section describes how to buy a MySQL DB instance on the management console and connect to the DB instance through DAS. If you are using RDS for the first time, see the constraints described in section [MySQL Constraints](#).

Process

To connect to a MySQL DB instance through DAS:

- **Step 1: Buy a DB instance.** Confirm the specifications, storage, network, and database account configurations of the MySQL DB instances based on service requirements.
- **Step 2: Connect to a DB instance through DAS.** Use DAS to connect to and manage the DB instance.

1.2.2 Step 1: Buy a DB Instance

Scenarios

This section describes how to buy a DB instance on the management console.

Currently, RDS for MySQL supports the yearly/monthly and pay-per-use billing modes. The DB instance class and storage space you need depend on your processing power and memory requirements.


You can create read replicas in batches when you are buying single or primary/standby DB instances.

Prerequisites

- You have registered a HUAWEI CLOUD account.
- After registering a HUAWEI CLOUD account, you can create an IAM user or user group on the IAM console and grant it specific operation permissions, to perform refined management on HUAWEI CLOUD. For details, see [Creating a User and Granting Permissions](#).
- Your account balance is greater than or equal to ¥0.

Procedure

Step 1 Log in to the management console.

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

Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

Step 4 On the **Instance Management** page, click **Buy DB Instance**.

Step 5 On the displayed page, select a billing mode, configure information about your DB instance. Then, click **Next**.

Figure 1-2 Billing mode and basic information

The screenshot shows the configuration page for a new RDS instance. At the top, the 'Billing Mode' is set to 'Yearly/Monthly' (selected) and 'Pay-per-use'. Below it, a 'Region' dropdown menu is visible. A note states: 'Regions are geographic areas isolated from each other. Resources are region-specific and cannot be used across regions through internal network connections. For low network latency and quick resource access, select the nearest region.'

The 'DB Instance Name' field is empty, with a note: 'If you buy multiple DB instances at a time, they will be named with four digits appended in the format "DB instance name-SN". For example, if the DB instance name is instance, the first instance will be named as instance-0001, the second as instance-0002, and so on.'

The 'DB Engine' is set to 'MySQL'. Other options are 'PostgreSQL' and 'Microsoft SQL Server'. A link 'Learn more about DB engines and versions.' is present.

The 'DB Engine Version' is set to '8.0'. Other options are '5.7' and '5.6'.

The 'DB Instance Type' is set to 'Primary/Standby'. Another option is 'Single'. A note states: 'Primary/standby HA architecture is suitable for production databases in large- and medium-sized enterprises, or for applications in Internet, IoT, retail e-commerce, logistics, and gaming industries.'

The 'Storage Type' is set to 'Ultra-High I/O'. Other options are 'Common I/O' and 'High I/O'. A link 'Learn more about storage types.' is present.

The 'Primary AZ' is set to 'az1'. Other options are 'az2', 'az3', and 'az4'.

The 'Standby AZ' is set to 'az1'. Other options are 'az2', 'az3', and 'az4'. A note states: 'Multi-AZ deployment provides disaster recovery capabilities across AZs.'

The 'Time Zone' is set to 'UTC+08:00 Beijing, Chongqing, Hong K...'.

RDS provides the following billing modes:

Yearly/Monthly

If you select this billing mode, skip **Step 6** and go to **Step 7**.

Pay-per-use

If you select this billing mode, go to **Step 6**.

Table 1-2 Basic information

Parameter	Description
Region	<p>The region your RDS resources will be located. You can change it on the creation page, or go back to the Instance Management page and change it in the upper left corner.</p> <p>NOTE Products in different regions cannot communicate with each other through a private network. After a DB instance is purchased, the region cannot be changed. Therefore, exercise caution when selecting a region.</p>

Parameter	Description
DB Instance Name	<p>Must start with a letter and consist of 4 to 64 characters. Only letters, digits, hyphens (-), and underscores (_) are allowed.</p> <ul style="list-style-type: none"> • If you intend to create multiple DB instances and read replicas, the length of each DB name will change. • If you create multiple DB instances at a time, they will be named with four digits appended to the DB instance name. For example, if you enter instance, the first instance will be named as instance-0001, the second as instance-0002, and so on.
DB Engine	Set to MySQL .
DB Engine Version	<p>For details, see DB Engines and Versions.</p> <p>Different DB engine versions are supported in different regions.</p> <p>If you use a MySQL database, select a proper DB engine version based on service requirements. You are advised to select the latest available version because it is more stable, reliable, and secure.</p>

Parameter	Description
DB Instance Type	<ul style="list-style-type: none"> ● Primary/Standby: uses the HA architecture with a primary DB instance and a synchronous standby DB instance. It is suitable for production databases of large- and medium-sized enterprises in Internet, Internet of Things (IoT), retail e-commerce sales, logistics, gaming, and other sectors. The standby DB instance improves instance reliability and is invisible to you after being created. An AZ is a physical region where resources use independent power supply and networks. AZs are physically isolated but interconnected through an internal network. Some regions support both single AZs and multiple AZs and some only support single AZs. To achieve higher reliability, RDS will automatically deploy your primary/standby instances in different physical servers even if you deploy primary/standby DB instances in the same AZ. If you attempt to create primary/standby DB 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. <ul style="list-style-type: none"> - If they are the same (default setting), the primary and standby DB instances are deployed in the same AZ. - If they are different, the primary and standby DB instances are deployed in different AZs to ensure failover support and high availability. ● Single: uses the single-node architecture, which is more cost-effective than mainstream primary/standby DB instances. It is suitable for developing and testing of microsites, and small- and medium-sized enterprises, or for learning about RDS.
Storage Type	<p>Determines the DB instance read/write speed. The higher the maximum throughput is, the higher the DB instance read/write speed can be.</p> <ul style="list-style-type: none"> ● Ultra-high I/O: supports a maximum throughput of 350 MB/s. ● Local SSD: reduces the I/O latency and improves the I/O performance. <p>NOTE</p> <ul style="list-style-type: none"> ● If you select DSS for Resource Type, only the storage type that you have selected when you buy the DSS service is displayed. ● After the DB instance is created, the storage type cannot be modified. ● To use local SSDs, contact customer service to apply for the required permissions.

Parameter	Description
Time Zone	Select a time zone when you are creating a DB instance, and you can change it after the DB instance is created.

Figure 1-3 DB instance specifications

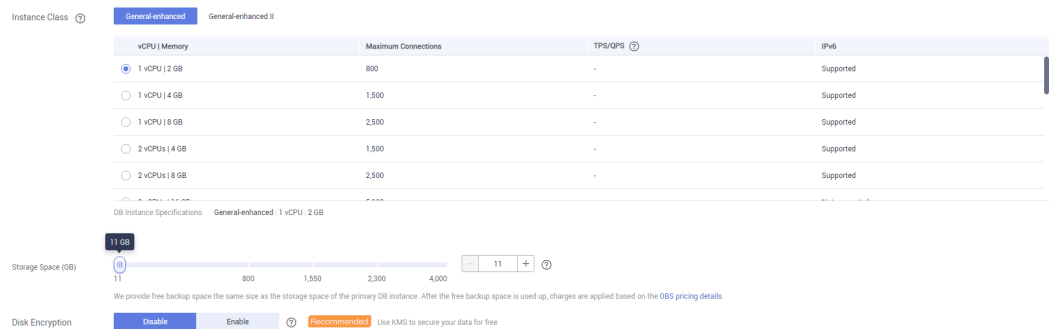


Table 1-3 Instance specifications

Parameter	Description
Instance Class	<p>Refers to the CPU and memory of a DB instance. Different instance classes have different numbers of database connections and different maximum IOPS.</p> <p>For details about instance classes, see DB Instance Classes.</p> <p>After a DB instance is created, you can change its CPU and memory. For details, see Changing a DB Instance Class.</p> <p>NOTE DB instances in a DCC only support the general-enhanced instance class.</p>
Resource Type	<ul style="list-style-type: none"> • EVS • DSS <p>NOTE This option is displayed only when you buy the Dedicated Distributed Storage Service (DSS) service.</p>
Storage Pool	Displayed only when you select DSS for Resource Type . The storage pool is secure because it is physically isolated from other pools.

Parameter	Description
Storage Space (GB)	<p>Contains the file system overhead required for inode, reserved block, and database operation. Storage space can range in size from 40 GB to 4,000 GB and can be scaled up only by a multiple of 10 GB. MySQL supports storage space from 11 GB to 10,000 GB. If you want to create a DB instance with storage space up to 10,000 GB or scale it up to 10,000 GB, contact customer service to apply for the permission.</p> <p>After a DB instance is created, you can scale up its storage space. For details, see Scaling Up Storage Space.</p>
Disk Encryption	<ul style="list-style-type: none"> ● Disabled: indicates the encryption function is disabled. ● Enabled: indicates the encryption function is enabled, improving data security but affecting system performance. <p>Key Name: indicates the tenant key. You can create or select a key.</p> <p>NOTE</p> <ul style="list-style-type: none"> - Once the DB instance is created, you cannot modify the disk encryption status or change the key. The backup data stored in OBS will not be encrypted. - After an RDS DB instance is created, do not disable or delete the key that is being used. Otherwise, RDS will be unavailable and data cannot be restored. - For details about how to create a key, see the "Creating a CMK" section in the <i>Data Encryption Workshop User Guide</i>.

Table 1-4 Database Security Service

Parameter	Description
DBSS	<p>Prevents database attacks, ensuring database security on the cloud.</p> <ul style="list-style-type: none"> ● After you subscribe to Database Security Service (DBSS), you cannot buy DB instances in patches. ● Only DB instances of certain specifications support the purchase of RDS and DBSS together. ● The DBSS administrator is admin, and the password is the same as that of the RDS root user. ● After you subscribe to DBSS, log in to the DBSS console, associate an EIP with the DBSS instance and configure security protection.

Figure 1-4 Network and database configuration

Relationship among VPCs, subnets, security groups, and DB instances

VPC [View In-use IP Address](#)

▲ After the RDS instance is created, the VPC cannot be changed. ECSs in different VPCs cannot communicate with each other by default. If you want to create a VPC, go to the VPC console. Available Private IP Addresses: 145

Security Group [View Security Group](#)

Inbound: TCP/8000, 3389, 22 | Outbound: --
In a security group, rules that authorize connections to DB instances apply to all DB instances associated with the security group.

Database Port

The database port of read replicas (if any) is the same as that of the primary DB instance.

Password

Administrator root

Administrator Password Keep your password secure. The system cannot retrieve your password.

Confirm Password

Parameter Template [View Parameter Template](#)

Table Name

Table 1-5 Network

Parameter	Description
VPC	<p>A dedicated virtual network in which your RDS DB instances are located. A VPC can isolate networks for different services. You can select an existing VPC or create a VPC. For details on how to create a VPC, see the "Creating a VPC" section in the <i>Virtual Private Cloud User Guide</i>.</p> <p>If no VPC is available, RDS allocates a VPC for you by default.</p> <p>NOTICE After the DB instance is created, the VPC cannot be changed.</p>
Subnet	<p>Improves network security by providing dedicated network resources that are logically isolated from other networks. Subnets take effect only within an AZ. The Dynamic Host Configuration Protocol (DHCP) function is enabled by default for subnets in which you plan to create RDS DB instances and cannot be disabled.</p> <p>A floating IP address is automatically assigned when you create a DB instance. You can also enter an unused floating IP address in the subnet CIDR block. After the DB instance is created, you can change the floating IP address.</p>
Security Group	<p>Enhances security by controlling access to RDS from other services. You need to add rules to a security group so that you can connect to your DB instance.</p> <p>If no security group is available or has been created, RDS allocates a security group to you by default.</p>

Table 1-6 Database configuration

Parameter	Description
Password	<ul style="list-style-type: none"> • Configure (default value): Configure the password when you are creating the DB instance. • Skip: The system does not set an initial password for you. <p>NOTICE To log in, you will have to reset a password for the DB instance. After a DB instance is created, you can reset the password. For details, see Resetting the Administrator Password.</p>
Administrator	The default login name for the database is root .
Administrator Password	<p>Must consist of 8 to 32 characters and contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters (~!@#%\$%^*_-=+?,). Enter a strong password. Periodically change it to improve security and prevent security risks such as brute force cracking.</p> <p>Keep this password secure. The system cannot retrieve it. After a DB instance is created, you can reset this password. For details, see Resetting the Administrator Password.</p>
Confirm Password	Must be the same as Administrator Password .
Parameter Template	<p>Contains engine configuration values that can be applied to one or more DB instances. If you intend to create primary/standby DB instances, they use the same parameter template. You can modify the instance parameters as required after the DB instance is created.</p> <p>NOTICE If you use a custom parameter template when creating a DB instance, the following specification-related parameters in the custom template are not delivered. Instead, the default values are used.</p> <ul style="list-style-type: none"> • back_log • innodb_io_capacity_max • max_connections • innodb_io_capacity • innodb_buffer_pool_size • innodb_buffer_pool_instances <p>You can modify the instance parameters as required after the DB instance is created. For details, see section Modifying Parameters in a Parameter Template.</p>
Table Name Case Sensitivity	Specifies whether the table name is case sensitive. This parameter is supported for MySQL 8.0 only.

Parameter	Description
Certificate	<p>(Optional) Specifies the certificate created by Cloud Certificate Manager (CCM). The default certificate is the system certificate that is automatically generated. You can also select another certificate from the drop-down list.</p> <p>NOTICE If you want to specify a certificate when creating a DB instance, you need to contact customer service to apply for the permission.</p>
Enterprise Project	<p>If the DB instance has been associated with an enterprise project, select the target project from the Enterprise Project drop-down list.</p> <p>You can also go to the ProjectMan console to create a project. For details about how to create a project, see the <i>ProjectMan User Guide</i>.</p>

Table 1-7 Tags

Parameter	Description
Tag	<p>Tags an RDS DB instance. This configuration is optional. Adding tags to RDS DB instances helps you better identify and manage the DB instances. A maximum of 10 tags can be added for each DB instance.</p> <p>After a DB instance is created, you can view its tag details on the Tags page. For detailed operations, see Managing Tags.</p>

Table 1-8 Purchase period

Parameter	Description
Required Duration	<p>This option is available only for yearly/monthly DB instances. The system will automatically calculate the configuration fee based on the selected required duration. The longer the required duration is, the larger discount you will enjoy.</p>
Auto-renew	<ul style="list-style-type: none"> This option is available only for yearly/monthly DB instances and is not selected by default. If you select this option, the auto-renew cycle is determined by the selected required duration.
Quantity	<p>RDS supports batch creation of DB instances. If you intend to create primary/standby DB instances and set Quantity to 1, a primary DB instance and a synchronous standby DB instance will be created.</p>

Table 1-9 Read replicas

Parameter	Description
Read Replica	By default, read replicas are named with "read" and two digits appended to the primary DB instance name. For example, if the primary instance name is instance-0001, the first read replica will be named as instance-0001-read-01. The network and storage configurations are the same as those of the primary DB instance.
Read Replica AZ	By default, the primary DB instance and read replicas are deployed in different AZs. You can choose AZs as required. NOTICE Products in different regions cannot communicate with each other through a private network and you cannot change the region of a DB instance after creating the instance. Therefore, exercise caution when selecting a region.
Instance Class	Refers to the CPU and memory of a DB instance.
Read Replica Quantity	You can choose to create read replicas when you are creating a primary DB instance. After the primary DB instance is created, the system automatically triggers the creation of read replicas. You can create a maximum of five read replicas for each primary DB instance. If you intend to create primary/standby DB instances and set Read Replica Quantity to 1 , the primary/standby DB instances and a read replica will be created.

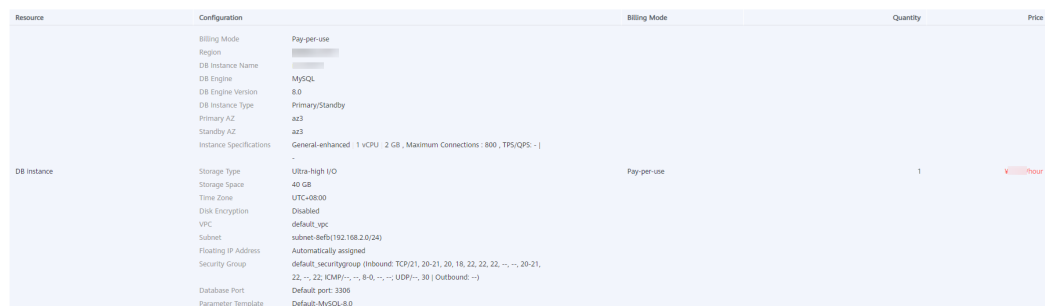
If you have any questions about the price, click **Pricing details** at the bottom of the page.

 **NOTE**

The performance of your DB instance depends on its configurations. Hardware configuration items include the instance specifications, storage type, and storage space.

Step 6 Confirm the specifications for pay-per-use DB instances.

Figure 1-5 Specifications confirmation



- If you need to modify your settings, click **Previous**.

- If you do not need to modify your settings, click **Submit**.

Skip **Step 7** and **Step 8** and go to **Step 9**.

Step 7 Confirm the order for yearly/monthly DB instances.

Figure 1-6 Order confirmation

Resource	Configuration	Billing Mode	Required Duration	Quantity	Price
DB Instance	Billing Mode: Yearly/Monthly Region: <input type="text"/> DB Instance Name: <input type="text"/> DB Engine: MySQL DB Engine Version: 8.0 DB Instance Type: Primary/Standby Primary AZ: ap3 Standby AZ: ap3 Instance Specifications: General-enhanced 1 vCPU 2 GB, Maximum Connections : 800, TPS/QPS : 1 - Storage Type: Ultra-High I/O Storage Space: 40 GB Time Zone: UTC+08:00 Disk Encryption: Disabled VPC: default_vpc Subnet: subnet-8efb192,168.2.0/24 Floating IP Address: Automatically assigned Security Group: default_securitygroup (Inbound: TCP/21, 20, 18, 22, 22, 22, ---, 20-21, 22, ---, 22, ICMP)---, ---, 8-9, ---, UDP/---, 30 Outbound: ---) Database Port: Default port: 3306 Parameter Template: Default-MySQL-8.0	Yearly/Monthly	1 year	1	

- If you need to modify your settings, click **Previous**.
- If you do not need to modify your settings, click **Pay Now**.


Step 8 Select a payment method and complete the payment.

 **NOTE**

This operation applies only to the yearly/monthly billing mode.

Step 9 To view and manage the DB instance, go to the **Instance Management** page.

- During the creation process, the DB instance status is **Creating**. You can view the detailed progress and result of the task on the **Task Center** page. To

refresh the DB instance list, click  in the upper right corner of the list. When the creation process is complete, the instance status will change to **Available**.

- The automated backup policy is enabled by default. After the DB instance is created, you can modify the automated backup policy. An automated full backup is immediately triggered after a DB instance is created.
- After a DB instance is created, you can enter a description for it.
- The default database port is **3306**. After a DB instance is created, you can change its port.

 **NOTE**

You are advised to change the database port in a timely manner. For details, see [Changing the Database Port](#).

----End

Related Operations

[Creating a DB Instance Using an API](#)


1.2.3 Step 2: Connect to a DB Instance Through DAS

Scenarios

Data Admin Service (DAS) enables you to connect and manage DB instances on a web-based console, simplifying database management and improving working efficiency. By default, you have the remote login permission. It is recommended that you use the DAS service to connect to DB instances, which is more secure and convenient.

Procedure

Step 1 Log in to the management console.

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

Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

Step 4 On the **Instance Management** page, locate the target DB instance and click **Log In** in the **Operation** column.

Alternatively, click the target DB instance on the **Instance Management** page. On the displayed **Basic Information** page, click **Log In** in the upper right corner of the page.

Step 5 On the displayed login page, enter the correct username and password and click **Log In**.

----End

Follow-up Operations

After logging in to the DB instance, you can create or migrate databases.

- [Creating a MySQL Database Using the Console](#)
- [Creating a MySQL Database Using an API](#)
- [Managing MySQL Databases Using DAS](#)
- [Migrating MySQL Databases Using DRS](#)
- [Migrating MySQL Databases Using mysqldump](#)

1.3 Connecting to a MySQL DB Instance Through a Private Network

1.3.1 Overview

Scenarios

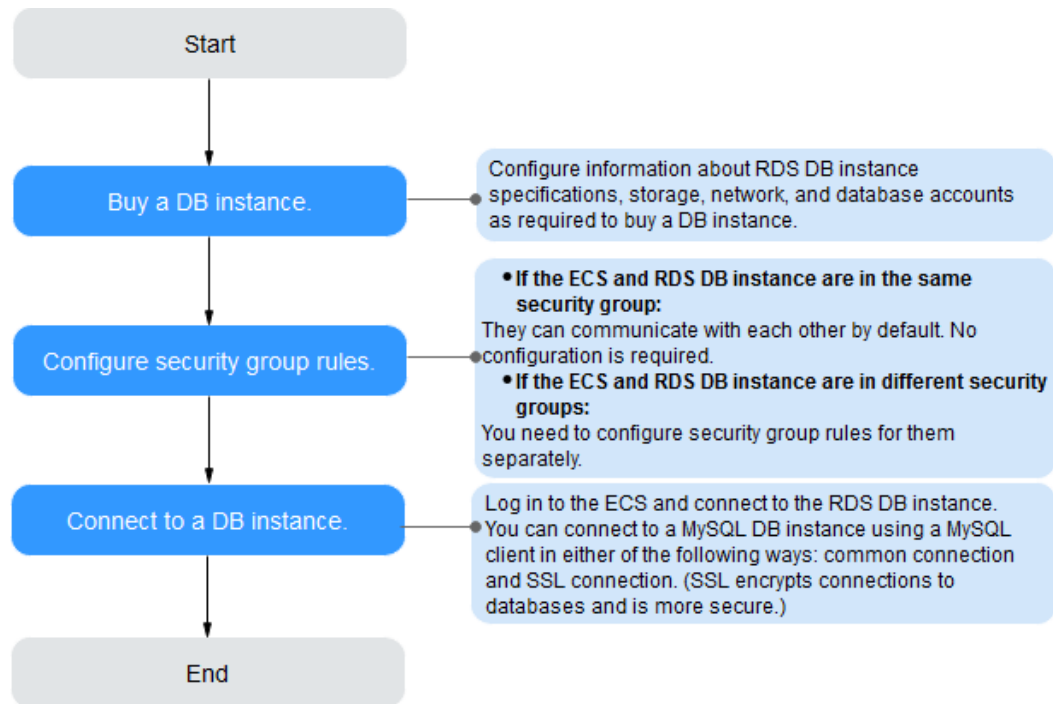
You can buy a DB instance on the management console and connect to the DB instance through an ECS.

If you are using RDS for the first time, see the constraints described in section [MySQL Constraints](#).

Process

Figure 1-7 illustrates the process of connecting to a MySQL DB instance through a private network.

Figure 1-7 Connecting to a DB instance through a private network



- **Step 1: Buy a DB instance.** Confirm the specifications, storage, network, and database account configurations of the MySQL DB instances based on service requirements.
- **Step 2: Configure security group rules.**
 - If the ECS and RDS DB instance are in the same security group, they can communicate with each other by default. No security group rule needs to be configured. Go to **Step 3: Connect to a DB Instance Through a Private Network**.
 - If the ECS and RDS DB instance are in different security groups, you need to configure security group rules for them, separately.
 - RDS DB instance: Configure an **inbound rule** for the security group with which the RDS DB instance is associated.
 - ECS: The default security group rule allows all outgoing data packets. In this case, you do not need to configure a security rule for the ECS. If not all outbound traffic is allowed in the security group, you need to configure an **outbound rule** for the ECS.
- **Step 3: Connect to a DB instance through a private network.** You can connect to a DB instance through a common connection or an SSL connection. The SSL connection encrypts data and is more secure.

1.3.2 Step 1: Buy a DB Instance

Scenarios

This section describes how to buy a DB instance on the management console.

Currently, RDS for MySQL supports the yearly/monthly and pay-per-use billing modes. The DB instance class and storage space you need depend on your processing power and memory requirements.

You can create read replicas in batches when you are buying single or primary/standby DB instances.

Prerequisites

- You have registered a HUAWEI CLOUD account.
- After registering a HUAWEI CLOUD account, you can create an IAM user or user group on the IAM console and grant it specific operation permissions, to perform refined management on HUAWEI CLOUD. For details, see [Creating a User and Granting Permissions](#).
- Your account balance is greater than or equal to ¥0.

Procedure

Step 1 Log in to the management console.

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

Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

Step 4 On the **Instance Management** page, click **Buy DB Instance**.

Step 5 On the displayed page, select a billing mode, configure information about your DB instance. Then, click **Next**.

Figure 1-8 Billing mode and basic information

The screenshot shows the configuration interface for an RDS instance. At the top, the 'Billing Mode' is set to 'Yearly/Monthly' (highlighted in blue) with a 'Pay-per-use' option also visible. Below this is a 'Region' dropdown menu. A note states: 'Regions are geographic areas isolated from each other. Resources are region-specific and cannot be used across regions through internal network connections. For low network latency and quick resource access, select the nearest region.'

The 'DB Instance Name' field is empty, with a note: 'If you buy multiple DB instances at a time, they will be named with four digits appended in the format "DB instance name-SN". For example, if the DB instance name is instance, the first instance will be named as instance-0001, the second as instance-0002, and so on.'

The 'DB Engine' is set to 'MySQL' (highlighted in blue), with 'PostgreSQL' and 'Microsoft SQL Server' as other options. A link 'Learn more about DB engines and versions.' is present.

The 'DB Engine Version' is set to '8.0' (highlighted in blue), with '5.7' and '5.6' as other options.

The 'DB Instance Type' is set to 'Primary/Standby' (highlighted in blue), with 'Single' as another option. A note states: 'Primary/standby HA architecture is suitable for production databases in large- and medium-sized enterprises, or for applications in Internet, IoT, retail e-commerce, logistics, and gaming industries.'

The 'Storage Type' is set to 'Ultra-High I/O' (highlighted in blue), with 'Common I/O' and 'High I/O' as other options. A link 'Learn more about storage types.' is present.

The 'Primary AZ' is set to 'az1' (highlighted in blue), with 'az2', 'az3', and 'az4' as other options.

The 'Standby AZ' is set to 'az1' (highlighted in blue), with 'az2', 'az3', and 'az4' as other options. A note states: 'Multi-AZ deployment provides disaster recovery capabilities across AZs.'

The 'Time Zone' is set to 'UTC+08:00 Beijing, Chongqing, Hong K...' (highlighted in blue).

RDS provides the following billing modes:

Yearly/Monthly

If you select this billing mode, skip **Step 6** and go to **Step 7**.

Pay-per-use

If you select this billing mode, go to **Step 6**.

Table 1-10 Basic information

Parameter	Description
Region	<p>The region your RDS resources will be located. You can change it on the creation page, or go back to the Instance Management page and change it in the upper left corner.</p> <p>NOTE Products in different regions cannot communicate with each other through a private network. After a DB instance is purchased, the region cannot be changed. Therefore, exercise caution when selecting a region.</p>

Parameter	Description
DB Instance Name	<p>Must start with a letter and consist of 4 to 64 characters. Only letters, digits, hyphens (-), and underscores (_) are allowed.</p> <ul style="list-style-type: none">• If you intend to create multiple DB instances and read replicas, the length of each DB name will change.• If you create multiple DB instances at a time, they will be named with four digits appended to the DB instance name. For example, if you enter instance, the first instance will be named as instance-0001, the second as instance-0002, and so on.
DB Engine	Set to MySQL .
DB Engine Version	<p>For details, see DB Engines and Versions.</p> <p>Different DB engine versions are supported in different regions.</p> <p>If you use a MySQL database, select a proper DB engine version based on service requirements. You are advised to select the latest available version because it is more stable, reliable, and secure.</p>

Parameter	Description
DB Instance Type	<ul style="list-style-type: none"> Primary/Standby: uses the HA architecture with a primary DB instance and a synchronous standby DB instance. It is suitable for production databases of large- and medium-sized enterprises in Internet, Internet of Things (IoT), retail e-commerce sales, logistics, gaming, and other sectors. The standby DB instance improves instance reliability and is invisible to you after being created. An AZ is a physical region where resources use independent power supply and networks. AZs are physically isolated but interconnected through an internal network. Some regions support both single AZs and multiple AZs and some only support single AZs. To achieve higher reliability, RDS will automatically deploy your primary/standby instances in different physical servers even if you deploy primary/standby DB instances in the same AZ. If you attempt to create primary/standby DB 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. <ul style="list-style-type: none"> - If they are the same (default setting), the primary and standby DB instances are deployed in the same AZ. - If they are different, the primary and standby DB instances are deployed in different AZs to ensure failover support and high availability. Single: uses the single-node architecture, which is more cost-effective than mainstream primary/standby DB instances. It is suitable for developing and testing of microsites, and small- and medium-sized enterprises, or for learning about RDS.
Storage Type	<p>Determines the DB instance read/write speed. The higher the maximum throughput is, the higher the DB instance read/write speed can be.</p> <ul style="list-style-type: none"> Ultra-high I/O: supports a maximum throughput of 350 MB/s. Local SSD: reduces the I/O latency and improves the I/O performance. <p>NOTE</p> <ul style="list-style-type: none"> If you select DSS for Resource Type, only the storage type that you have selected when you buy the DSS service is displayed. After the DB instance is created, the storage type cannot be modified. To use local SSDs, contact customer service to apply for the required permissions.

Parameter	Description
Time Zone	Select a time zone when you are creating a DB instance, and you can change it after the DB instance is created.

Figure 1-9 DB instance specifications

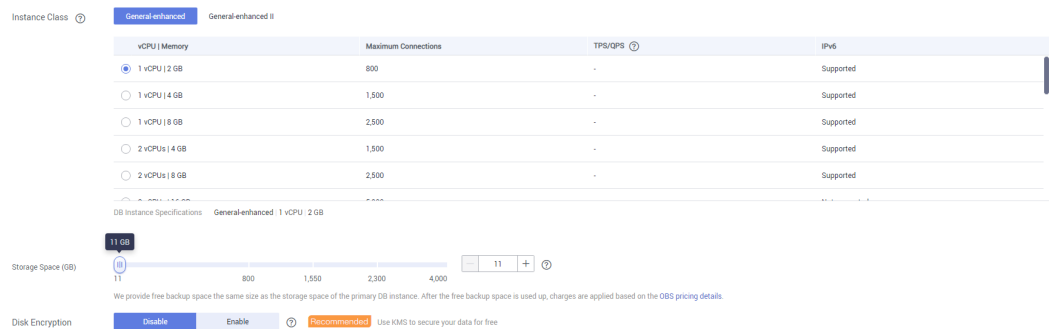


Table 1-11 Instance specifications

Parameter	Description
Instance Class	<p>Refers to the CPU and memory of a DB instance. Different instance classes have different numbers of database connections and different maximum IOPS.</p> <p>For details about instance classes, see DB Instance Classes.</p> <p>After a DB instance is created, you can change its CPU and memory. For details, see Changing a DB Instance Class.</p> <p>NOTE DB instances in a DCC only support the general-enhanced instance class.</p>
Resource Type	<ul style="list-style-type: none"> • EVS • DSS <p>NOTE This option is displayed only when you buy the Dedicated Distributed Storage Service (DSS) service.</p>
Storage Pool	Displayed only when you select DSS for Resource Type . The storage pool is secure because it is physically isolated from other pools.

Parameter	Description
Storage Space (GB)	<p>Contains the file system overhead required for inode, reserved block, and database operation. Storage space can range in size from 40 GB to 4,000 GB and can be scaled up only by a multiple of 10 GB. MySQL supports storage space from 11 GB to 10,000 GB. If you want to create a DB instance with storage space up to 10,000 GB or scale it up to 10,000 GB, contact customer service to apply for the permission.</p> <p>After a DB instance is created, you can scale up its storage space. For details, see Scaling Up Storage Space.</p>
Disk Encryption	<ul style="list-style-type: none"> • Disabled: indicates the encryption function is disabled. • Enabled: indicates the encryption function is enabled, improving data security but affecting system performance. Key Name: indicates the tenant key. You can create or select a key. <p>NOTE</p> <ul style="list-style-type: none"> - Once the DB instance is created, you cannot modify the disk encryption status or change the key. The backup data stored in OBS will not be encrypted. - After an RDS DB instance is created, do not disable or delete the key that is being used. Otherwise, RDS will be unavailable and data cannot be restored. - For details about how to create a key, see the "Creating a CMK" section in the <i>Data Encryption Workshop User Guide</i>.

Table 1-12 Database Security Service

Parameter	Description
DBSS	<p>Prevents database attacks, ensuring database security on the cloud.</p> <ul style="list-style-type: none"> • After you subscribe to Database Security Service (DBSS), you cannot buy DB instances in patches. • Only DB instances of certain specifications support the purchase of RDS and DBSS together. • The DBSS administrator is admin, and the password is the same as that of the RDS root user. • After you subscribe to DBSS, log in to the DBSS console, associate an EIP with the DBSS instance and configure security protection.

Figure 1-10 Network and database configuration

Relationship among VPCs, subnets, security groups, and DB instances

VPC [View In-use IP Address](#)

▲ After the RDS instance is created, the VPC cannot be changed. ECSs in different VPCs cannot communicate with each other by default. If you want to create a VPC, go to the [VPC console](#). Available Private IP Addresses: 145

Security Group [View Security Group](#)

Inbound: TCP/8000, 3389, 22 | Outbound: --
In a security group, rules that authorize connections to DB instances apply to all DB instances associated with the security group.

Database Port

The database port of read replicas (if any) is the same as that of the primary DB instance.

Password

Administrator root

Administrator Password Keep your password secure. The system cannot retrieve your password.

Confirm Password

Parameter Template [View Parameter Template](#)

Table Name

Table 1-13 Network

Parameter	Description
VPC	<p>A dedicated virtual network in which your RDS DB instances are located. A VPC can isolate networks for different services. You can select an existing VPC or create a VPC. For details on how to create a VPC, see the "Creating a VPC" section in the <i>Virtual Private Cloud User Guide</i>.</p> <p>If no VPC is available, RDS allocates a VPC for you by default.</p> <p>NOTICE After the DB instance is created, the VPC cannot be changed.</p>
Subnet	<p>Improves network security by providing dedicated network resources that are logically isolated from other networks. Subnets take effect only within an AZ. The Dynamic Host Configuration Protocol (DHCP) function is enabled by default for subnets in which you plan to create RDS DB instances and cannot be disabled.</p> <p>A floating IP address is automatically assigned when you create a DB instance. You can also enter an unused floating IP address in the subnet CIDR block. After the DB instance is created, you can change the floating IP address.</p>
Security Group	<p>Enhances security by controlling access to RDS from other services. You need to add rules to a security group so that you can connect to your DB instance.</p> <p>If no security group is available or has been created, RDS allocates a security group to you by default.</p>

Table 1-14 Database configuration

Parameter	Description
Password	<ul style="list-style-type: none"> • Configure (default value): Configure the password when you are creating the DB instance. • Skip: The system does not set an initial password for you. <p>NOTICE To log in, you will have to reset a password for the DB instance. After a DB instance is created, you can reset the password. For details, see Resetting the Administrator Password.</p>
Administrator	The default login name for the database is root .
Administrator Password	<p>Must consist of 8 to 32 characters and contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters (~!@#%\$%^*_-=+?,). Enter a strong password. Periodically change it to improve security and prevent security risks such as brute force cracking.</p> <p>Keep this password secure. The system cannot retrieve it. After a DB instance is created, you can reset this password. For details, see Resetting the Administrator Password.</p>
Confirm Password	Must be the same as Administrator Password .
Parameter Template	<p>Contains engine configuration values that can be applied to one or more DB instances. If you intend to create primary/standby DB instances, they use the same parameter template. You can modify the instance parameters as required after the DB instance is created.</p> <p>NOTICE If you use a custom parameter template when creating a DB instance, the following specification-related parameters in the custom template are not delivered. Instead, the default values are used.</p> <ul style="list-style-type: none"> • back_log • innodb_io_capacity_max • max_connections • innodb_io_capacity • innodb_buffer_pool_size • innodb_buffer_pool_instances <p>You can modify the instance parameters as required after the DB instance is created. For details, see section Modifying Parameters in a Parameter Template.</p>
Table Name Case Sensitivity	Specifies whether the table name is case sensitive. This parameter is supported for MySQL 8.0 only.

Parameter	Description
Certificate	<p>(Optional) Specifies the certificate created by Cloud Certificate Manager (CCM). The default certificate is the system certificate that is automatically generated. You can also select another certificate from the drop-down list.</p> <p>NOTICE If you want to specify a certificate when creating a DB instance, you need to contact customer service to apply for the permission.</p>
Enterprise Project	<p>If the DB instance has been associated with an enterprise project, select the target project from the Enterprise Project drop-down list.</p> <p>You can also go to the ProjectMan console to create a project. For details about how to create a project, see the <i>ProjectMan User Guide</i>.</p>

Table 1-15 Tags

Parameter	Description
Tag	<p>Tags an RDS DB instance. This configuration is optional. Adding tags to RDS DB instances helps you better identify and manage the DB instances. A maximum of 10 tags can be added for each DB instance.</p> <p>After a DB instance is created, you can view its tag details on the Tags page. For detailed operations, see Managing Tags.</p>

Table 1-16 Purchase period

Parameter	Description
Required Duration	<p>This option is available only for yearly/monthly DB instances. The system will automatically calculate the configuration fee based on the selected required duration. The longer the required duration is, the larger discount you will enjoy.</p>
Auto-renew	<ul style="list-style-type: none"> This option is available only for yearly/monthly DB instances and is not selected by default. If you select this option, the auto-renew cycle is determined by the selected required duration.
Quantity	<p>RDS supports batch creation of DB instances. If you intend to create primary/standby DB instances and set Quantity to 1, a primary DB instance and a synchronous standby DB instance will be created.</p>

Table 1-17 Read replicas

Parameter	Description
Read Replica	By default, read replicas are named with "read" and two digits appended to the primary DB instance name. For example, if the primary instance name is instance-0001, the first read replica will be named as instance-0001-read-01. The network and storage configurations are the same as those of the primary DB instance.
Read Replica AZ	By default, the primary DB instance and read replicas are deployed in different AZs. You can choose AZs as required. NOTICE Products in different regions cannot communicate with each other through a private network and you cannot change the region of a DB instance after creating the instance. Therefore, exercise caution when selecting a region.
Instance Class	Refers to the CPU and memory of a DB instance.
Read Replica Quantity	You can choose to create read replicas when you are creating a primary DB instance. After the primary DB instance is created, the system automatically triggers the creation of read replicas. You can create a maximum of five read replicas for each primary DB instance. If you intend to create primary/standby DB instances and set Read Replica Quantity to 1 , the primary/standby DB instances and a read replica will be created.

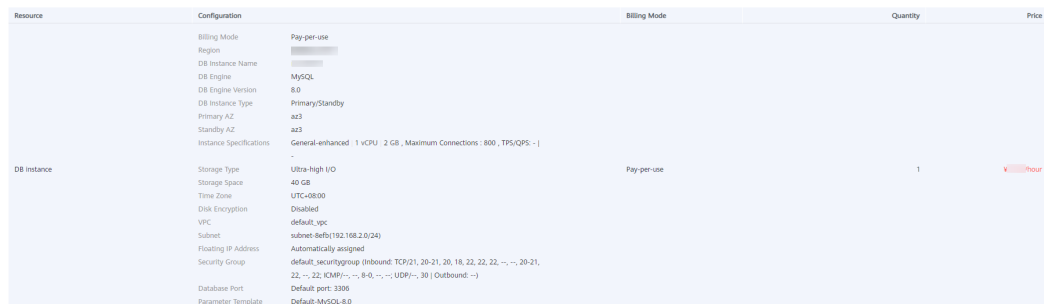
If you have any questions about the price, click **Pricing details** at the bottom of the page.

NOTE

The performance of your DB instance depends on its configurations. Hardware configuration items include the instance specifications, storage type, and storage space.

Step 6 Confirm the specifications for pay-per-use DB instances.

Figure 1-11 Specifications confirmation



- If you need to modify your settings, click **Previous**.

- If you do not need to modify your settings, click **Submit**.

Skip **Step 7** and **Step 8** and go to **Step 9**.

Step 7 Confirm the order for yearly/monthly DB instances.

Figure 1-12 Order confirmation

Resource	Configuration	Billing Mode	Required Duration	Quantity	Price
DB Instance	Billing Mode: Yearly/Monthly Region: <input type="text"/> DB Instance Name: <input type="text"/> DB Engine: MySQL DB Engine Version: 8.0 DB Instance Type: Primary/Standby Primary AZ: ap3 Standby AZ: ap3 Instance Specifications: General-enhanced 1 vCPU 2 GB, Maximum Connections : 800, TPS/QPS : - / - Storage Type: Ultra-High I/O Storage Space: 40 GB Time Zone: UTC+08:00 Disk Encryption: Disabled VPC: default_vpc Subnet: subnet-8efb192.168.2.0/24 Floating IP Address: Automatically assigned Security Group: default_securitygroup (Inbound: TCP/21, 20, 18, 22, 22, 22, ---, 20-21, 22, ---, 22, ICMP)---, ---, 8-9, ---, ---, UDP)---, 30 Outbound: ---) Database Port: Default port: 3306 Parameter Template: Default-MySQL-8.0	Yearly/Monthly	1 year	1	

- If you need to modify your settings, click **Previous**.
- If you do not need to modify your settings, click **Pay Now**.


Step 8 Select a payment method and complete the payment.

 **NOTE**

This operation applies only to the yearly/monthly billing mode.

Step 9 To view and manage the DB instance, go to the **Instance Management** page.

- During the creation process, the DB instance status is **Creating**. You can view the detailed progress and result of the task on the **Task Center** page. To

refresh the DB instance list, click  in the upper right corner of the list. When the creation process is complete, the instance status will change to **Available**.

- The automated backup policy is enabled by default. After the DB instance is created, you can modify the automated backup policy. An automated full backup is immediately triggered after a DB instance is created.
- After a DB instance is created, you can enter a description for it.
- The default database port is **3306**. After a DB instance is created, you can change its port.

 **NOTE**

You are advised to change the database port in a timely manner. For details, see [Changing the Database Port](#).

----End

Related Operations

[Creating a DB Instance Using an API](#)

1.3.3 Step 2: Configure Security Group Rules

Scenarios

A security group is a collection of access control rules for ECSs and RDS DB instances that have the same security protection requirements and are mutually trusted in a VPC.

This section describes how to create a security group to enable specific IP addresses and ports to access RDS.

Check whether the ECS and RDS DB instance are in the same security group.

- If the ECS and RDS DB instance are in the same security group, they can communicate with each other by default. No security group rule needs to be configured. Go to [Step 3: Connect to a DB Instance Through a Private Network](#).
- If the ECS and RDS DB instance are in different security groups, you need to configure security group rules for them, separately.
 - RDS DB instance: Configure an **inbound rule** for the security group with which the RDS DB instance is associated.
 - ECS: The default security group rule allows all outgoing data packets. In this case, you do not need to configure a security rule for the ECS. If not all outbound traffic is allowed in the security group, you need to configure an **outbound rule** for the ECS.

This section describes how to configure an inbound rule for an RDS DB instance.

For details about the requirements of security group rules, see the [Adding a Security Group Rule](#) section in the *Virtual Private Cloud User Guide*.

Precautions

The default security group rule allows all outgoing data packets. ECSs and RDS DB instances can access each other if they are deployed in the same security group. After a security group is created, you can configure security group rules to control access from and to the DB instances in the security group.

- By default, you can create a maximum of 500 security group rules.
- One security group can be associated with only one RDS DB instance.
- Too many security group rules will increase the first packet latency. You are advised to create a maximum of 50 rules for each security group.
- To access an RDS DB instance from resources outside the security group, you need to configure an **inbound rule** for the security group associated with the RDS DB instance.

NOTE

To ensure security of data and DB instances, you are advised to use the principle of least privilege for database access. Change the database port (default value: **3306**), and set the IP address to the remote server's address or any IP address in the remote server's smallest subnet to control the access scope of the remote server.

If you use **0.0.0.0/0**, you enable all IP addresses to access RDS DB instances in the security group.

For details about the requirements of security group rules, see the [Adding a Security Group Rule](#) section in the *Virtual Private Cloud User Guide*.

Procedure


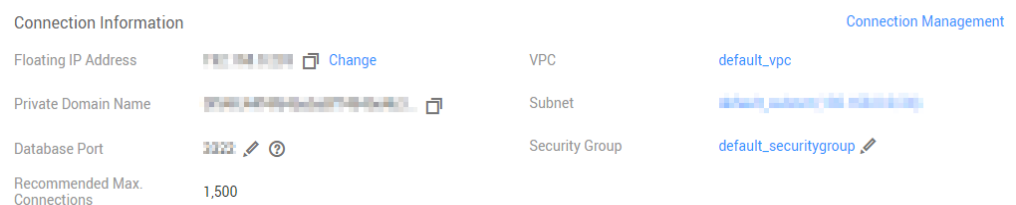
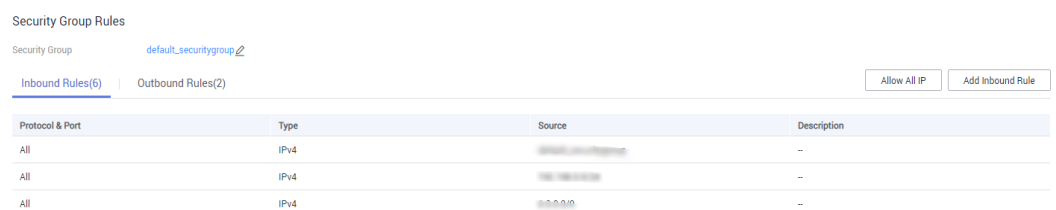
- Step 1** Log in to the management console.
- Step 2** Click  in the upper left corner and select a region and a project.
- Step 3** Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.
- Step 4** On the **Instance Management** page, click the target DB instance.
- Step 5** Configure a security group rule.
 - In the **Connection Information** area on the **Basic Information** page, click the security group.

Figure 1-13 Connection information



- You can also choose **Connection Management** in the navigation pane on the left. In the **Security Group Rules** pane on the **Private Connection** page, click the security group name in the **Security Group** field. The **Security Groups** page is displayed.

Figure 1-14 Security group rules



- You can also choose **Connection Management** in the navigation pane on the left. In the **Security Group Rules** pane on the **Private Connection** page, click **Allow All IP** or **Add Inbound Rule**.

NOTE

Allow All IP allows all IP addresses to access RDS DB instances in the security group, which poses high security risks. Exercise caution when performing this operation.

- Step 6** On the inbound rule tab, click **Add Rule**. In the displayed dialog box, set required parameters to add an inbound rule.

You can click + to add more inbound rules.

Figure 1-15 Adding an inbound rule

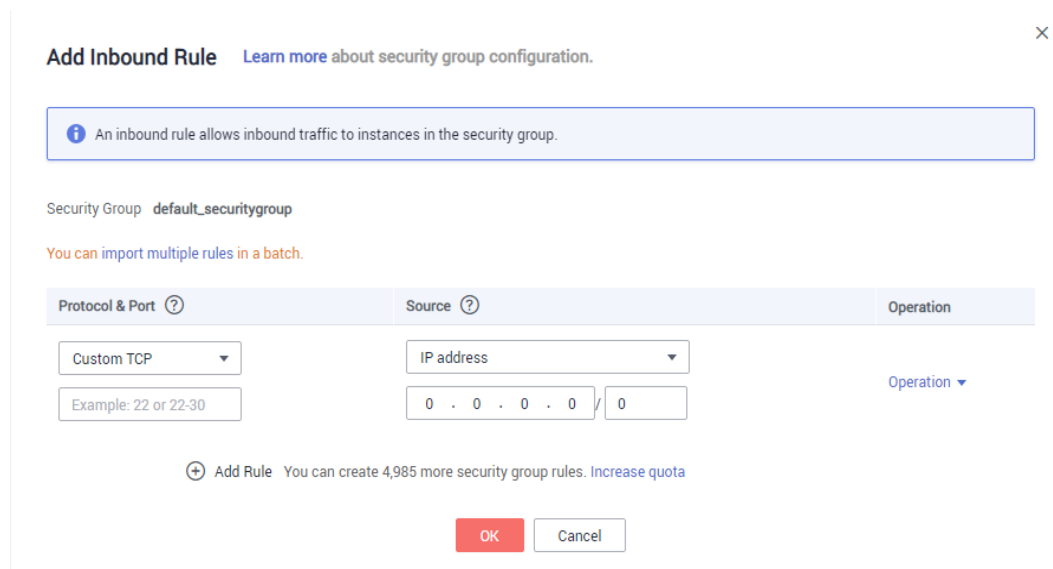


Table 1-18 Inbound rule parameter description

Parameter	Description	Example Value
Protocol & Port	Specifies the network protocol. Currently, the value can be All , TCP , UDP , ICMP , GRE , or others.	Custom TCP
	Port : specifies the port or port range over which the traffic can reach your ECS. Common ports are listed in Common Ports Used by ECSs .	When connecting to the DB instance through a private network, enter the port of the target DB instance.
Source	Specifies the source of the security group rule. The value can be another security group or a single IP address. For example: <ul style="list-style-type: none"> • xxx.xxx.xxx.xxx/32 (IPv4 address) • xxx.xxx.xxx.0/24 (subnet) • 0.0.0.0/0 (any IP address) 	0.0.0.0/0
Description	Provides supplementary information about the security group rule. This parameter is optional. The description can contain a maximum of 255 characters and cannot contain angle brackets (<) or (>).	N/A

----End

1.3.4 Step 3: Connect to a DB Instance Through a Private Network

You can connect to a DB instance through a common connection or an SSL connection. The SSL connection encrypts data and is more secure.

Prerequisites

1. Log in to the ECS.
 - For details on how to create and log in to an ECS, see [Purchasing an ECS](#) and [Logging In to an ECS](#).
 - To connect to a DB instance through an ECS, you must ensure that:
 - The ECS and DB instance must be in the same VPC.
 - The ECS must be allowed by the security group to access RDS DB instances.
 - If the security group to which the target DB instance belongs is the default security group, you do not need to configure security group rules.
 - If the security group to which the target DB instance belongs is not the default security group, check whether the security group rules allow the ECS to connect to the DB instance. For details, see section [Step 2: Configure Security Group Rules](#).

If the security group rules allow the access from the ECS, the ECS can connect to the DB instance.

If the security group rules do not allow the access from the ECS, you need to add a security group rule. The ECS must be allowed by the security group to access RDS DB instances.

2. Use a database client to connect to the target DB instance.

You can use a database client to connect to the target DB instance in the Linux or Windows OS.

- In the Linux OS, install the MySQL client on the device that can access RDS. It is recommended that you download a MySQL client running a version later than that of the DB instance.

For details about how to obtain and install the MySQL client, see [How Can I Install the MySQL Client?](#)

- In the Windows OS, you can use any common database client to connect to the target DB instance in a similar way.

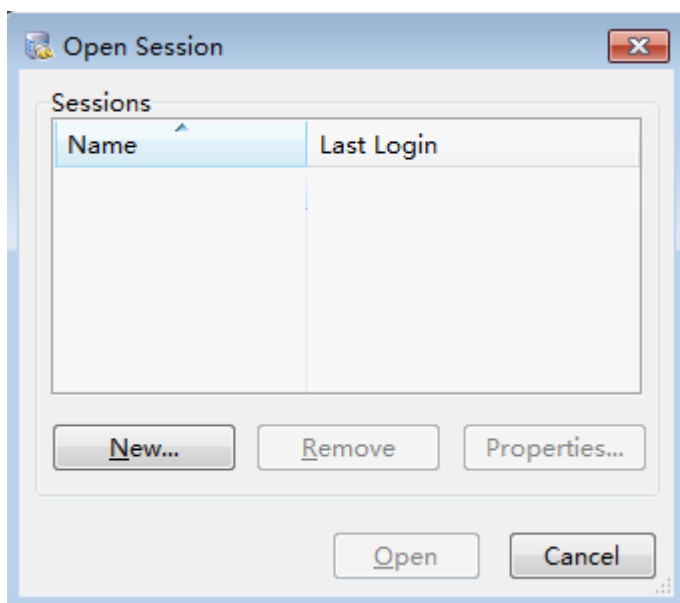
The database client MySQL-Front is used as an example in [Using MySQL-Front to Connect to a DB Instance](#).

Using MySQL-Front to Connect to a DB Instance

Step 1 Start MySQL-Front.

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

Figure 1-16 Connection management



Step 3 Enter the information of the DB instance to be connected and click **Ok**, as shown in [Figure 1-17](#).

Figure 1-17 Adding an account

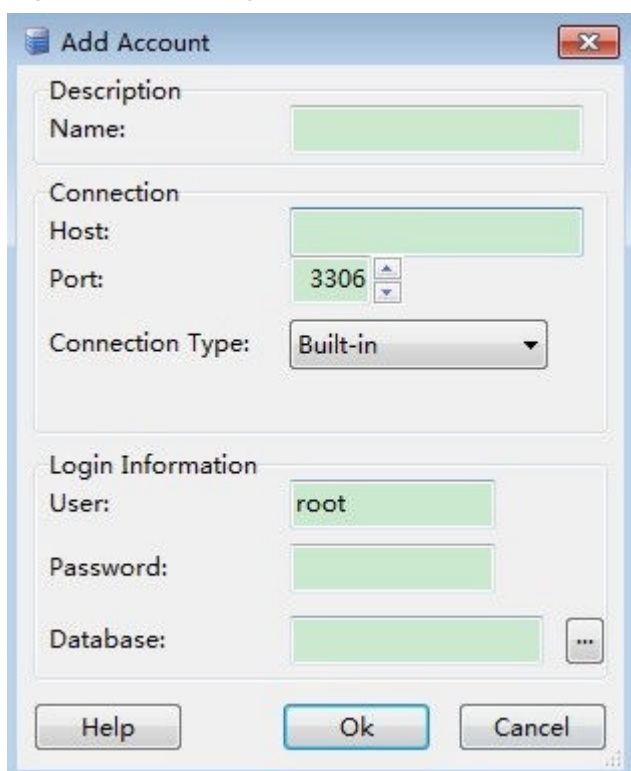
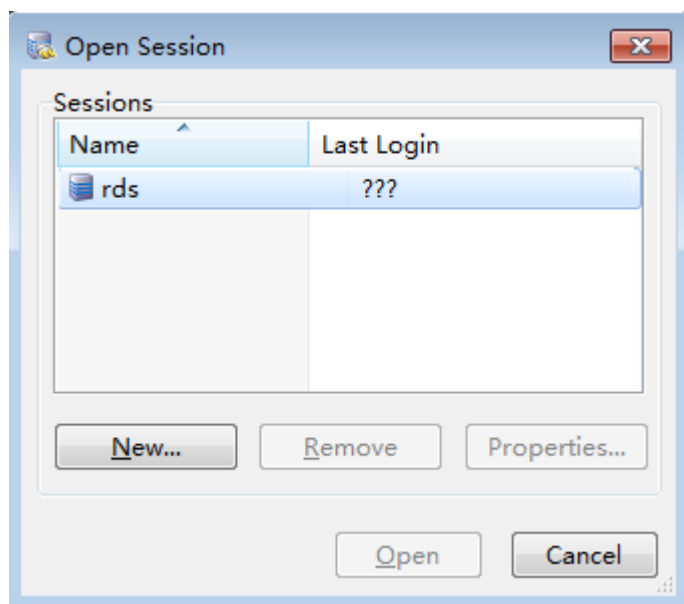


Table 1-19 Parameter description

Parameter	Description
Name	Indicates the name of the database connection task. If you do not set this parameter, it will be the same as Host by default.
Host	Indicates the floating IP address of the DB instance to be connected. To view the floating IP address and port of the DB instance, perform the following steps: <ol style="list-style-type: none"> 1. Log in to the RDS console. 2. Select the region in which the DB instance is located. 3. Click the target DB instance to enter the Basic Information page. 4. In the Connection Information area, view the floating IP address.
Port	Indicates the private network port of the DB instance.
User	Indicates the name of the user who will access the DB instance. The default user is root .
Password	Indicates the password of the RDS database account.

Step 4 In the displayed window, select the connection that you have created in [Step 3](#) and click **Open**. If the connection information is correct, the DB instance is successfully connected.

Figure 1-18 Opening a session




 NOTE

If the connection fails, see [What Should I Do If an ECS Cannot Connect to an RDS DB Instance?](#)


----End

SSL Connection

Step 1 Log in to the management console.

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

Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

Step 4 In the **DB Information** area on the **Basic Information** page, click  in the **SSL** field to download the root certificate or certificate bundle.

Step 5 Import the root certificate to the Linux OS on the ECS. For details, see [How Can I Import the Root Certificate to the Windows or Linux OS?](#)

 NOTE

- Since April 2017, RDS has offered a new root certificate that has a 20-year validation period. The new certificate takes effect after DB instances are rebooted. Replace the old certificate before it expires to improve system security.
For details, see [How Can I Identify the Validity Period of the SSL Root Certificate?](#)
- You can also download the certificate bundle, which contains both the new certificate provided since April 2017 and the old certificate.

Step 6 Connect to an RDS DB instance. The Linux OS is used as an example.

```
mysql -h <hostName> -P <port> -u <userName> -p --ssl-ca=<caName>
```

Table 1-20 Parameter description

Parameter	Description
<hostName>	Indicates the floating IP address. To obtain this parameter, go to the Basic Information page of the DB instance and view the floating IP address in the Connection Information area.
<port>	Indicates the database port. By default, the value is 3306 . To obtain this parameter, go to the Basic Information page of the DB instance and view the database port in the Connection Information area.
<userName>	Indicates the username of the RDS database account. The default administrator is root .
<caName>	Indicates the name of the SSL certificate file, which should be stored in the same directory where the command is executed.

For example, to connect to a DB instance through an SSL connection as user **root**, run the following command:

```
mysql -h 172.16.0.31 -P 3306 -u root -p --ssl-ca=ca.pem
```

Enter the password of the database account if the following information is displayed:

Enter password:

 NOTE

If the connection fails, see [What Should I Do If an ECS Cannot Connect to an RDS DB Instance?](#)

----End

FAQs

[What Should I Do If I Fail to Connect to an RDS DB Instance?](#)

Follow-up Operations

After logging in to the DB instance, you can create or migrate databases.

- [Creating a MySQL Database Using the Console](#)
- [Creating a MySQL Database Using an API](#)
- [Managing MySQL Databases Using DAS](#)
- [Migrating MySQL Databases Using DRS](#)
- [Migrating MySQL Databases Using mysqldump](#)

1.4 Connecting to a MySQL DB Instance Through a Public Network

1.4.1 Overview

Scenarios

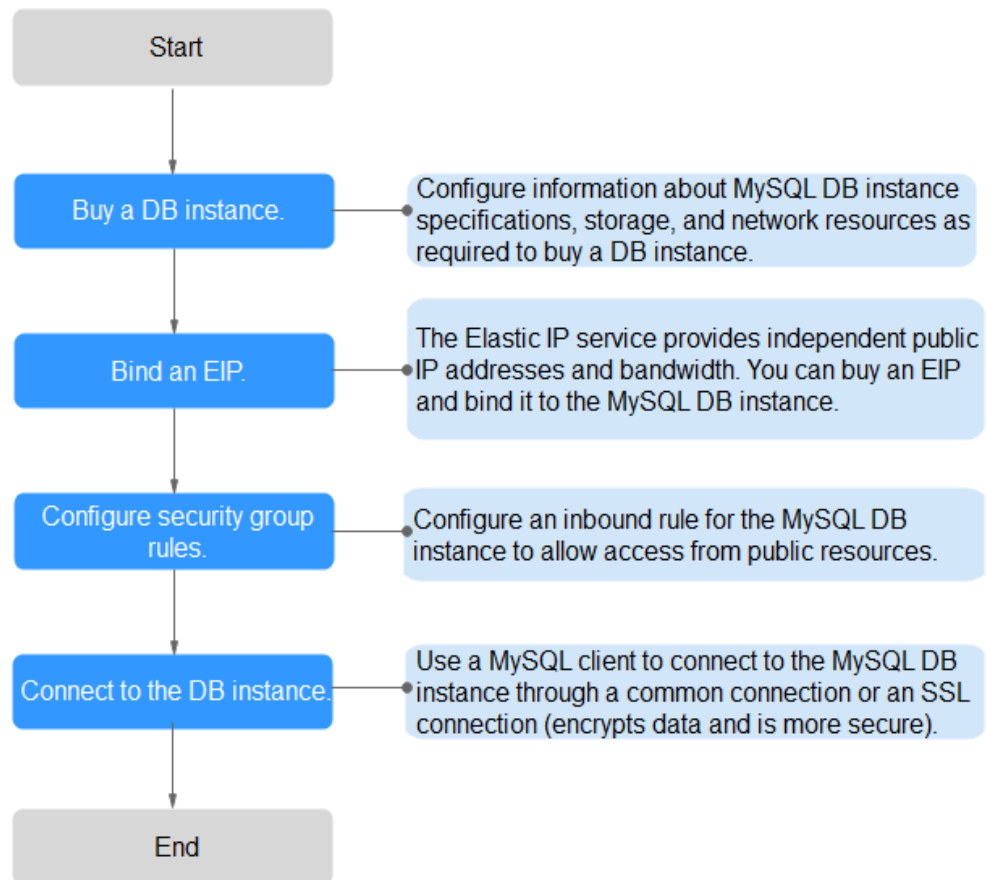
This section describes how to buy a MySQL DB instance on the management console and bind an EIP to the DB instance to make the instance publicly accessible.

If you are using RDS for the first time, see the constraints described in section [MySQL Constraints](#).

Process

Figure 1-19 illustrates the process of connecting to a MySQL DB instance through a public network.

Figure 1-19 Connecting to a DB instance through a public network



- **Step 1: Buy a DB instance.** Confirm the specifications, storage, network, and database account configurations of the MySQL DB instances based on service requirements.
- **Step 2: Bind an EIP.** The EIP provides independent public IP addresses and bandwidth for Internet access. You can apply for an EIP on the VPC console and bind the EIP to the RDS DB instance.
- **Step 2: Configure security group rules.** To access an RDS DB instance from resources outside the security group, you need to configure an **inbound rule** for the security group associated with the RDS DB instance.
- **Step 4: Connect to a DB instance through a public network.** You can connect to a DB instance through a common connection or an SSL connection. The SSL connection encrypts data and is more secure.

1.4.2 Step 1: Buy a DB Instance

Scenarios

This section describes how to buy a DB instance on the management console.

Currently, RDS for MySQL supports the yearly/monthly and pay-per-use billing modes. The DB instance class and storage space you need depend on your processing power and memory requirements.

You can create read replicas in batches when you are buying single or primary/standby DB instances.

Prerequisites

- You have registered a HUAWEI CLOUD account.
- After registering a HUAWEI CLOUD account, you can create an IAM user or user group on the IAM console and grant it specific operation permissions, to perform refined management on HUAWEI CLOUD. For details, see [Creating a User and Granting Permissions](#).
- Your account balance is greater than or equal to ¥0.

Procedure


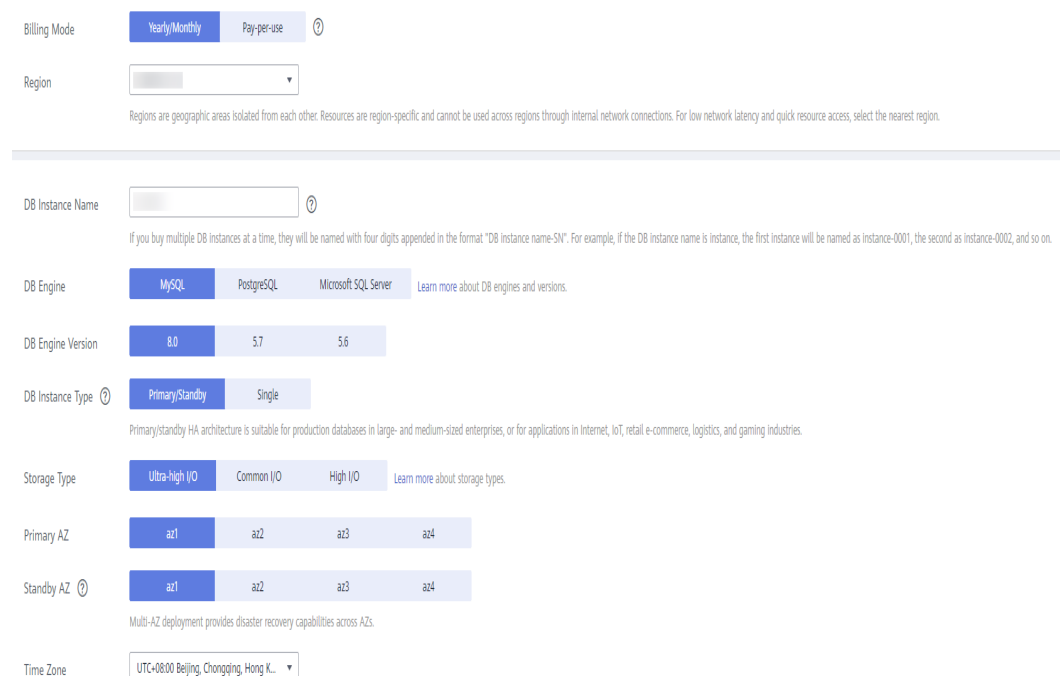
- Step 1** Log in to the management console.
- Step 2** Click  in the upper left corner and select a region and a project.
- Step 3** Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.
- Step 4** On the **Instance Management** page, click **Buy DB Instance**.
- Step 5** On the displayed page, select a billing mode, configure information about your DB instance. Then, click **Next**.

Figure 1-20 Billing mode and basic information



The screenshot shows the configuration page for a DB instance. The options are as follows:

- Billing Mode:** Radio buttons for **Yearly/Monthly** (selected) and **Pay-per-use**.
- Region:** A dropdown menu.
- DB Instance Name:** A text input field.
- DB Engine:** Radio buttons for **MySQL** (selected), **PostgreSQL**, and **Microsoft SQL Server**.
- DB Engine Version:** Radio buttons for **8.0** (selected), **5.7**, and **5.6**.
- DB Instance Type:** Radio buttons for **Primary/Standby** (selected) and **Single**.
- Storage Type:** Radio buttons for **Ultra-High I/O** (selected), **Common I/O**, and **High I/O**.
- Primary AZ:** Radio buttons for **az1** (selected), **az2**, **az3**, and **az4**.
- Standby AZ:** Radio buttons for **az1** (selected), **az2**, **az3**, and **az4**.
- Time Zone:** A dropdown menu showing **UTC+08:00 Beijing, Chongqing, Hong K...**.

RDS provides the following billing modes:

Yearly/Monthly

If you select this billing mode, skip **Step 6** and go to **Step 7**.

Pay-per-use

If you select this billing mode, go to [Step 6](#).

Table 1-21 Basic information

Parameter	Description
Region	<p>The region your RDS resources will be located. You can change it on the creation page, or go back to the Instance Management page and change it in the upper left corner.</p> <p>NOTE Products in different regions cannot communicate with each other through a private network. After a DB instance is purchased, the region cannot be changed. Therefore, exercise caution when selecting a region.</p>
DB Instance Name	<p>Must start with a letter and consist of 4 to 64 characters. Only letters, digits, hyphens (-), and underscores (_) are allowed.</p> <ul style="list-style-type: none"> • If you intend to create multiple DB instances and read replicas, the length of each DB name will change. • If you create multiple DB instances at a time, they will be named with four digits appended to the DB instance name. For example, if you enter instance, the first instance will be named as instance-0001, the second as instance-0002, and so on.
DB Engine	Set to MySQL .
DB Engine Version	<p>For details, see DB Engines and Versions.</p> <p>Different DB engine versions are supported in different regions.</p> <p>If you use a MySQL database, select a proper DB engine version based on service requirements. You are advised to select the latest available version because it is more stable, reliable, and secure.</p>

Parameter	Description
DB Instance Type	<ul style="list-style-type: none"> ● Primary/Standby: uses the HA architecture with a primary DB instance and a synchronous standby DB instance. It is suitable for production databases of large- and medium-sized enterprises in Internet, Internet of Things (IoT), retail e-commerce sales, logistics, gaming, and other sectors. The standby DB instance improves instance reliability and is invisible to you after being created. An AZ is a physical region where resources use independent power supply and networks. AZs are physically isolated but interconnected through an internal network. Some regions support both single AZs and multiple AZs and some only support single AZs. To achieve higher reliability, RDS will automatically deploy your primary/standby instances in different physical servers even if you deploy primary/standby DB instances in the same AZ. If you attempt to create primary/standby DB 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. <ul style="list-style-type: none"> - If they are the same (default setting), the primary and standby DB instances are deployed in the same AZ. - If they are different, the primary and standby DB instances are deployed in different AZs to ensure failover support and high availability. ● Single: uses the single-node architecture, which is more cost-effective than mainstream primary/standby DB instances. It is suitable for developing and testing of microsites, and small- and medium-sized enterprises, or for learning about RDS.
Storage Type	<p>Determines the DB instance read/write speed. The higher the maximum throughput is, the higher the DB instance read/write speed can be.</p> <ul style="list-style-type: none"> ● Ultra-high I/O: supports a maximum throughput of 350 MB/s. ● Local SSD: reduces the I/O latency and improves the I/O performance. <p>NOTE</p> <ul style="list-style-type: none"> ● If you select DSS for Resource Type, only the storage type that you have selected when you buy the DSS service is displayed. ● After the DB instance is created, the storage type cannot be modified. ● To use local SSDs, contact customer service to apply for the required permissions.

Parameter	Description
Time Zone	Select a time zone when you are creating a DB instance, and you can change it after the DB instance is created.

Figure 1-21 DB instance specifications

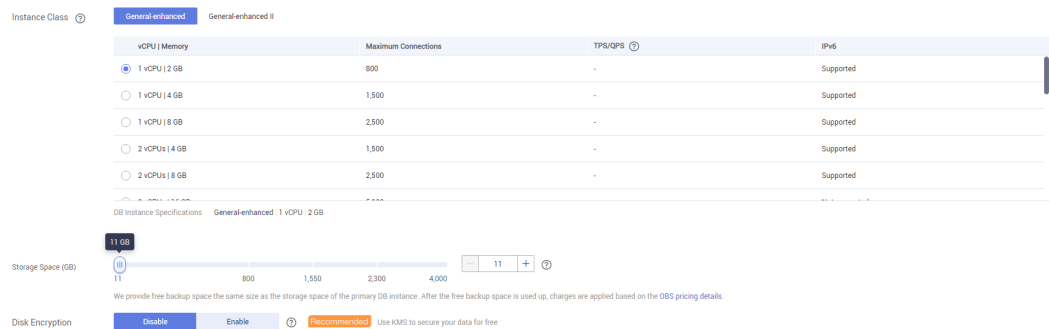


Table 1-22 Instance specifications

Parameter	Description
Instance Class	<p>Refers to the CPU and memory of a DB instance. Different instance classes have different numbers of database connections and different maximum IOPS.</p> <p>For details about instance classes, see DB Instance Classes.</p> <p>After a DB instance is created, you can change its CPU and memory. For details, see Changing a DB Instance Class.</p> <p>NOTE DB instances in a DCC only support the general-enhanced instance class.</p>
Resource Type	<ul style="list-style-type: none"> • EVS • DSS <p>NOTE This option is displayed only when you buy the Dedicated Distributed Storage Service (DSS) service.</p>
Storage Pool	Displayed only when you select DSS for Resource Type . The storage pool is secure because it is physically isolated from other pools.

Parameter	Description
Storage Space (GB)	<p>Contains the file system overhead required for inode, reserved block, and database operation. Storage space can range in size from 40 GB to 4,000 GB and can be scaled up only by a multiple of 10 GB. MySQL supports storage space from 11 GB to 10,000 GB. If you want to create a DB instance with storage space up to 10,000 GB or scale it up to 10,000 GB, contact customer service to apply for the permission.</p> <p>After a DB instance is created, you can scale up its storage space. For details, see Scaling Up Storage Space.</p>
Disk Encryption	<ul style="list-style-type: none"> • Disabled: indicates the encryption function is disabled. • Enabled: indicates the encryption function is enabled, improving data security but affecting system performance. <p>Key Name: indicates the tenant key. You can create or select a key.</p> <p>NOTE</p> <ul style="list-style-type: none"> - Once the DB instance is created, you cannot modify the disk encryption status or change the key. The backup data stored in OBS will not be encrypted. - After an RDS DB instance is created, do not disable or delete the key that is being used. Otherwise, RDS will be unavailable and data cannot be restored. - For details about how to create a key, see the "Creating a CMK" section in the <i>Data Encryption Workshop User Guide</i>.

Table 1-23 Database Security Service

Parameter	Description
DBSS	<p>Prevents database attacks, ensuring database security on the cloud.</p> <ul style="list-style-type: none"> • After you subscribe to Database Security Service (DBSS), you cannot buy DB instances in patches. • Only DB instances of certain specifications support the purchase of RDS and DBSS together. • The DBSS administrator is admin, and the password is the same as that of the RDS root user. • After you subscribe to DBSS, log in to the DBSS console, associate an EIP with the DBSS instance and configure security protection.

Figure 1-22 Network and database configuration

Relationship among VPCs, subnets, security groups, and DB instances

VPC [View In-use IP Address](#)

▲ After the RDS instance is created, the VPC cannot be changed. ECSs in different VPCs cannot communicate with each other by default. If you want to create a VPC, go to the VPC console. Available Private IP Addresses: 145

Security Group [View Security Group](#)

Inbound: TCP/8000, 3389, 22 | Outbound: --
In a security group, rules that authorize connections to DB instances apply to all DB instances associated with the security group.

Database Port

The database port of read replicas (if any) is the same as that of the primary DB instance.

Password

Administrator root

Administrator Password Keep your password secure. The system cannot retrieve your password.

Confirm Password

Parameter Template [View Parameter Template](#)

Table Name

Table 1-24 Network

Parameter	Description
VPC	<p>A dedicated virtual network in which your RDS DB instances are located. A VPC can isolate networks for different services. You can select an existing VPC or create a VPC. For details on how to create a VPC, see the "Creating a VPC" section in the <i>Virtual Private Cloud User Guide</i>.</p> <p>If no VPC is available, RDS allocates a VPC for you by default.</p> <p>NOTICE After the DB instance is created, the VPC cannot be changed.</p>
Subnet	<p>Improves network security by providing dedicated network resources that are logically isolated from other networks. Subnets take effect only within an AZ. The Dynamic Host Configuration Protocol (DHCP) function is enabled by default for subnets in which you plan to create RDS DB instances and cannot be disabled.</p> <p>A floating IP address is automatically assigned when you create a DB instance. You can also enter an unused floating IP address in the subnet CIDR block. After the DB instance is created, you can change the floating IP address.</p>
Security Group	<p>Enhances security by controlling access to RDS from other services. You need to add rules to a security group so that you can connect to your DB instance.</p> <p>If no security group is available or has been created, RDS allocates a security group to you by default.</p>

Table 1-25 Database configuration

Parameter	Description
Password	<ul style="list-style-type: none"> • Configure (default value): Configure the password when you are creating the DB instance. • Skip: The system does not set an initial password for you. <p>NOTICE To log in, you will have to reset a password for the DB instance. After a DB instance is created, you can reset the password. For details, see Resetting the Administrator Password.</p>
Administrator	The default login name for the database is root .
Administrator Password	<p>Must consist of 8 to 32 characters and contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters (~!@#%\$%^*_-=+?,). Enter a strong password. Periodically change it to improve security and prevent security risks such as brute force cracking.</p> <p>Keep this password secure. The system cannot retrieve it. After a DB instance is created, you can reset this password. For details, see Resetting the Administrator Password.</p>
Confirm Password	Must be the same as Administrator Password .
Parameter Template	<p>Contains engine configuration values that can be applied to one or more DB instances. If you intend to create primary/standby DB instances, they use the same parameter template. You can modify the instance parameters as required after the DB instance is created.</p> <p>NOTICE If you use a custom parameter template when creating a DB instance, the following specification-related parameters in the custom template are not delivered. Instead, the default values are used.</p> <ul style="list-style-type: none"> • back_log • innodb_io_capacity_max • max_connections • innodb_io_capacity • innodb_buffer_pool_size • innodb_buffer_pool_instances <p>You can modify the instance parameters as required after the DB instance is created. For details, see section Modifying Parameters in a Parameter Template.</p>
Table Name Case Sensitivity	Specifies whether the table name is case sensitive. This parameter is supported for MySQL 8.0 only.

Parameter	Description
Certificate	<p>(Optional) Specifies the certificate created by Cloud Certificate Manager (CCM). The default certificate is the system certificate that is automatically generated. You can also select another certificate from the drop-down list.</p> <p>NOTICE If you want to specify a certificate when creating a DB instance, you need to contact customer service to apply for the permission.</p>
Enterprise Project	<p>If the DB instance has been associated with an enterprise project, select the target project from the Enterprise Project drop-down list.</p> <p>You can also go to the ProjectMan console to create a project. For details about how to create a project, see the <i>ProjectMan User Guide</i>.</p>

Table 1-26 Tags

Parameter	Description
Tag	<p>Tags an RDS DB instance. This configuration is optional. Adding tags to RDS DB instances helps you better identify and manage the DB instances. A maximum of 10 tags can be added for each DB instance.</p> <p>After a DB instance is created, you can view its tag details on the Tags page. For detailed operations, see Managing Tags.</p>

Table 1-27 Purchase period

Parameter	Description
Required Duration	<p>This option is available only for yearly/monthly DB instances. The system will automatically calculate the configuration fee based on the selected required duration. The longer the required duration is, the larger discount you will enjoy.</p>
Auto-renew	<ul style="list-style-type: none"> This option is available only for yearly/monthly DB instances and is not selected by default. If you select this option, the auto-renew cycle is determined by the selected required duration.
Quantity	<p>RDS supports batch creation of DB instances. If you intend to create primary/standby DB instances and set Quantity to 1, a primary DB instance and a synchronous standby DB instance will be created.</p>

Table 1-28 Read replicas

Parameter	Description
Read Replica	By default, read replicas are named with "read" and two digits appended to the primary DB instance name. For example, if the primary instance name is instance-0001, the first read replica will be named as instance-0001-read-01. The network and storage configurations are the same as those of the primary DB instance.
Read Replica AZ	By default, the primary DB instance and read replicas are deployed in different AZs. You can choose AZs as required. NOTICE Products in different regions cannot communicate with each other through a private network and you cannot change the region of a DB instance after creating the instance. Therefore, exercise caution when selecting a region.
Instance Class	Refers to the CPU and memory of a DB instance.
Read Replica Quantity	You can choose to create read replicas when you are creating a primary DB instance. After the primary DB instance is created, the system automatically triggers the creation of read replicas. You can create a maximum of five read replicas for each primary DB instance. If you intend to create primary/standby DB instances and set Read Replica Quantity to 1 , the primary/standby DB instances and a read replica will be created.

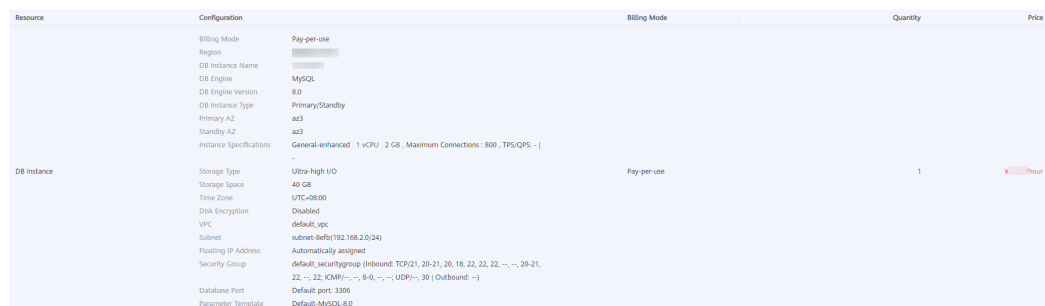
If you have any questions about the price, click **Pricing details** at the bottom of the page.

 **NOTE**

The performance of your DB instance depends on its configurations. Hardware configuration items include the instance specifications, storage type, and storage space.

Step 6 Confirm the specifications for pay-per-use DB instances.

Figure 1-23 Specifications confirmation



- If you need to modify your settings, click **Previous**.

- If you do not need to modify your settings, click **Submit**.

Skip **Step 7** and **Step 8** and go to **Step 9**.

Step 7 Confirm the order for yearly/monthly DB instances.

Figure 1-24 Order confirmation

Resource	Configuration	Billing Mode	Required Duration	Quantity	Price
DB Instance	Billing Mode: Yearly/Monthly Region: <input type="text"/> DB Instance Name: <input type="text"/> DB Engine: MySQL DB Engine Version: 8.0 DB Instance Type: Primary/Standby Primary AZ: ap3 Standby AZ: ap3 Instance Specifications: General-enhanced 1 vCPU 2 GB, Maximum Connections : 800, TPS/QPS : - / - Storage Type: Ultra-High I/O Storage Space: 40 GB Time Zone: UTC+08:00 Disk Encryption: Disabled VPC: default_vpc Subnet: subnet-8efb192,168.2.0/24 Floating IP Address: Automatically assigned Security Group: default_securitygroup (Inbound: TCP/21, 20, 18, 22, 22, 22, ---, 20-21, 22, ---, 22, ICMP)---, ---, 8-9, ---, ---, UDP)---, 30 Outbound: ---) Database Port: Default port: 3306 Parameter Template: Default-MySQL-8.0	Yearly/Monthly	1 year	1	

- If you need to modify your settings, click **Previous**.
- If you do not need to modify your settings, click **Pay Now**.


Step 8 Select a payment method and complete the payment.

 **NOTE**

This operation applies only to the yearly/monthly billing mode.

Step 9 To view and manage the DB instance, go to the **Instance Management** page.

- During the creation process, the DB instance status is **Creating**. You can view the detailed progress and result of the task on the **Task Center** page. To

refresh the DB instance list, click  in the upper right corner of the list. When the creation process is complete, the instance status will change to **Available**.

- The automated backup policy is enabled by default. After the DB instance is created, you can modify the automated backup policy. An automated full backup is immediately triggered after a DB instance is created.
- After a DB instance is created, you can enter a description for it.
- The default database port is **3306**. After a DB instance is created, you can change its port.

 **NOTE**

You are advised to change the database port in a timely manner. For details, see [Changing the Database Port](#).

----End

Related Operations

[Creating a DB Instance Using an API](#)

1.4.3 Step 2: Bind an EIP

Scenarios

You can bind an EIP to the DB instance for public access and can unbind the EIP from the DB instance as required.

Precautions

- You need to configure security groups and enable specific IP addresses and ports to access the target DB instance. Before accessing the DB instance, you need to add an individual IP address or an IP address range that will access the DB instance to the inbound rule. For details, see section [Step 3: Configure Security Group Rules](#).
- You can buy an EIP on the VPC console and bind it to a DB instance. For pricing details, see [Elastic IP pricing details](#).

Binding an EIP

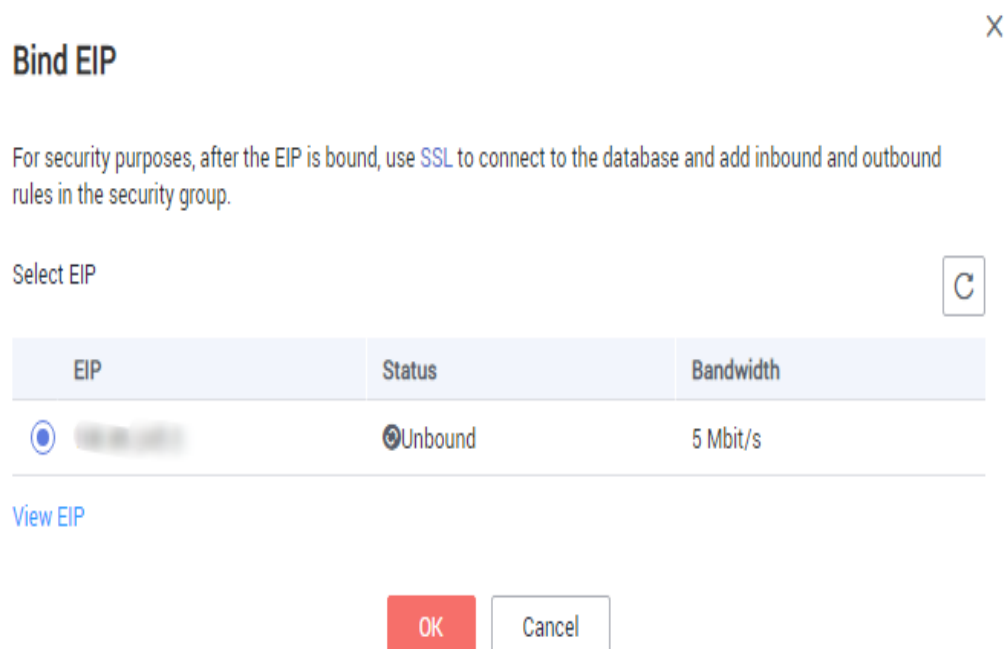
Step 1 On the **Instance Management** page, click the target DB instance.

Step 2 In the navigation pane on the left, choose **Connection Management**. In the **Connection Information** pane on the **Public Connection** page, click **Bind** in the **EIP** field.

Step 3 In the displayed dialog box, select an EIP and click **OK**.

If no available EIPs are displayed, click **View EIP** to obtain an EIP.

Figure 1-25 Selecting an EIP



Step 4 On the **Public Connection** page, view the EIP that has been bound to the DB instance.

You can also view the progress and result of binding an EIP to a DB instance on the **Task Center** page.

----End

1.4.4 Step 3: Configure Security Group Rules

Scenarios

A security group is a collection of access control rules for ECSs and RDS DB instances that have the same security protection requirements and are mutually trusted in a VPC.

This section describes how to create a security group to enable specific IP addresses and ports to access RDS.

When you attempt to connect to an RDS DB instance through an EIP, you need to configure an **inbound rule** for the security group associated with the DB instance.

Precautions

The default security group rule allows all outgoing data packets. ECSs and RDS DB instances can access each other if they are deployed in the same security group. After a security group is created, you can configure security group rules to control access from and to the DB instances in the security group.

- By default, you can create a maximum of 500 security group rules.
- One security group can be associated with only one RDS DB instance.
- Too many security group rules will increase the first packet latency. You are advised to create a maximum of 50 rules for each security group.
- To access an RDS DB instance from resources outside the security group, you need to configure an **inbound rule** for the security group associated with the RDS DB instance.

NOTE

To ensure security of data and DB instances, you are advised to use the principle of least privilege for database access. Change the database port (default value: **3306**), and set the IP address to the remote server's address or any IP address in the remote server's smallest subnet to control the access scope of the remote server.

If you use **0.0.0.0/0**, you enable all IP addresses to access RDS DB instances in the security group.

For details about the requirements of security group rules, see the [Adding a Security Group Rule](#) section in the *Virtual Private Cloud User Guide*.

Procedure

Step 1 Log in to the management console.

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

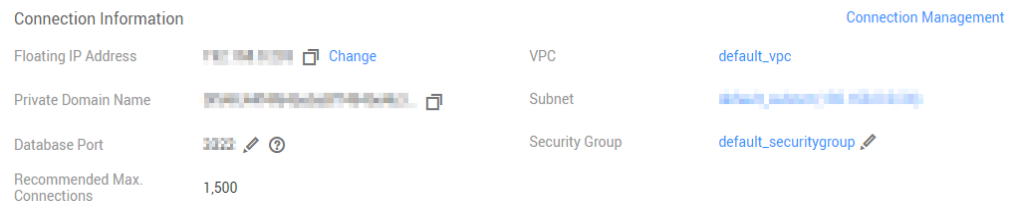
Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

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

Step 5 Configure security group rules.

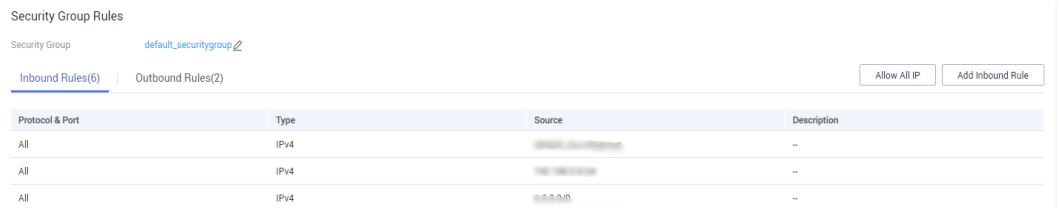
- In the **Connection Information** area on the **Basic Information** page, click the security group.

Figure 1-26 Connection information



- You can also choose **Connection Management** in the navigation pane on the left. In the **Security Group Rules** pane on the **Public Connection** page, click the security group name in the **Security Group** field. The **Security Groups** page is displayed.

Figure 1-27 Security group rules



- You can also choose **Connection Management** in the navigation pane on the left. In the **Security Group Rules** pane on the **Public Connection** page, click **Allow All IP** or **Add Inbound Rule**.

NOTE

Allow All IP allows all IP addresses to access RDS DB instances in the security group, which poses high security risks. Exercise caution when performing this operation.

Step 6 On the inbound rule tab, click **Add Rule**. In the displayed dialog box, set required parameters to add an inbound rule.

You can click **+** to add more inbound rules.

Figure 1-28 Adding an inbound rule

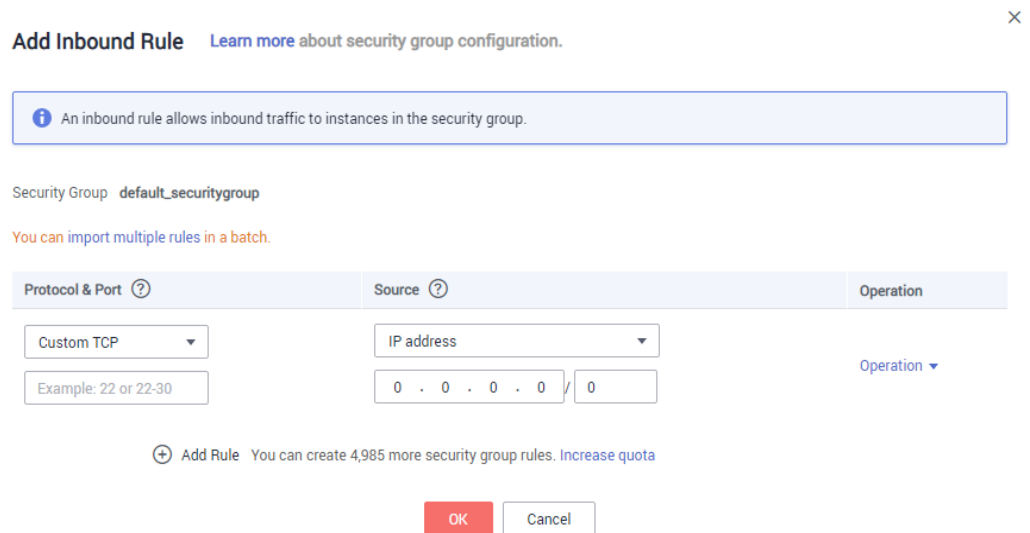


Table 1-29 Inbound rule parameter description

Parameter	Description	Example Value
Protocol & Port	Specifies the network protocol. Currently, the value can be All , TCP , UDP , ICMP , GRE , or others.	Custom TCP
	Port : specifies the port or port range over which the traffic can reach your ECS. Common ports are listed in Common Ports Used by ECSs .	When connecting to the DB instance through a public network, enter the port of the target DB instance.
Source	Specifies the source of the security group rule. The value can be another security group or a single IP address. For example: <ul style="list-style-type: none"> • xxx.xxx.xxx.xxx/32 (IPv4 address) • xxx.xxx.xxx.0/24 (subnet) • 0.0.0.0/0 (any IP address) 	0.0.0.0/0
Description	Provides supplementary information about the security group rule. This parameter is optional. The description can contain a maximum of 255 characters and cannot contain angle brackets (<) or (>).	-

----End

1.4.5 Step 4: Connect to a DB Instance Through a Public Network

You can connect to a DB instance through a common connection or an SSL connection. The SSL connection encrypts data and is more secure.

Preparations

1. Bind an EIP to the target DB instance and configure security group rules.
 - a. Bind an EIP to the target DB instance.
For details about how to bind an EIP, see section [Step 2: Bind an EIP](#).
 - b. Obtain the IP address of the local device.
 - c. Configure security group rules.
Add the IP address and port obtained in [1.b](#) to the inbound rule of the security group.
For details about how to configure a security group rule, see section [Step 3: Configure Security Group Rules](#).
 - d. Run the **ping** command to check the connectivity between the local device and the DB instance.
2. Use a database client to connect to the target DB instance.

You can use a database client to connect to the target DB instance in the Linux or Windows operating system (OS).

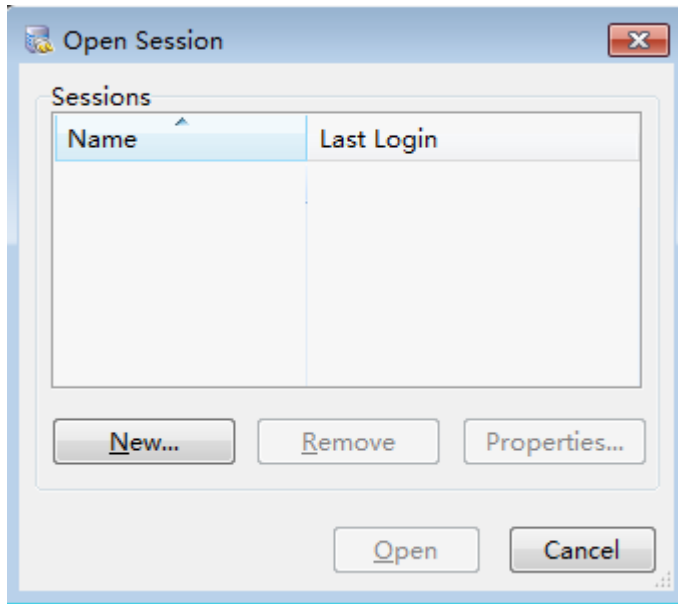
 - In the Linux OS, you need to install a MySQL client on the ECS. It is recommended that you download a MySQL client running a version later than that of the DB instance.
For details about how to obtain and install the MySQL client, see [How Can I Install the MySQL Client?](#)
 - In the Windows OS, you can use any common database client to connect to the target DB instance in a similar way.
The database client MySQL-Front is used as an example in [Using MySQL-Front to Connect to a DB Instance](#).

Using MySQL-Front to Connect to a DB Instance

Step 1 Start MySQL-Front.

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

Figure 1-29 Connection management



Step 3 Enter the information of the DB instance to be connected and click **Ok**, as shown in [Figure 1-30](#).

Figure 1-30 Adding an account

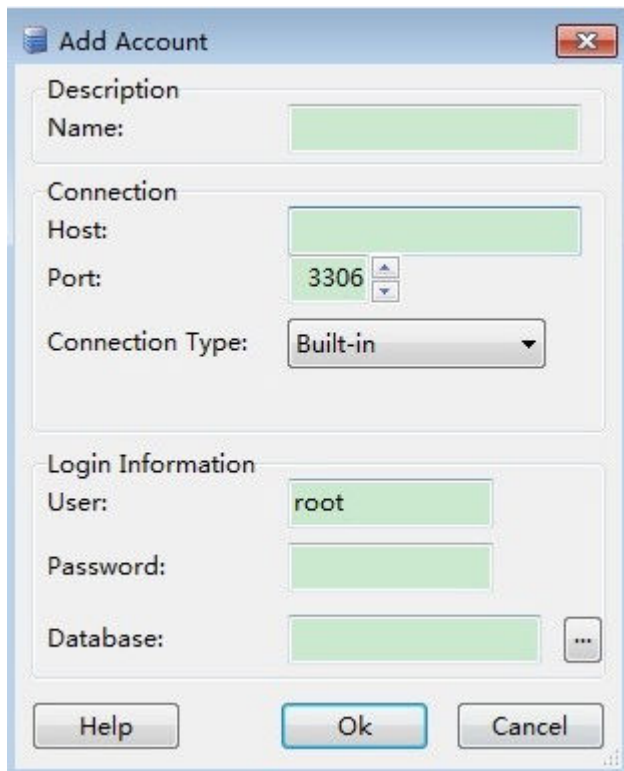


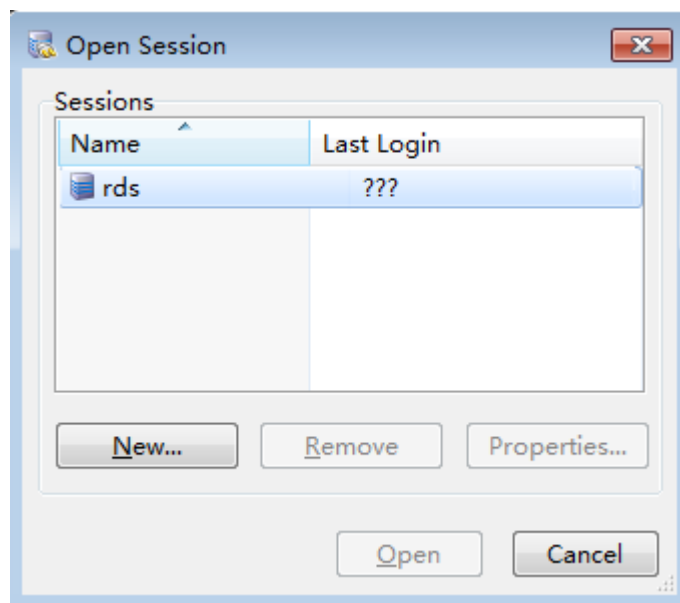
Table 1-30 Parameter description

Parameter	Description
Name	Indicates the name of the database connection task. If you do not set this parameter, it will be the same as Host by default.
Host	Indicates the EIP of the DB instance to be connected.
Port	Indicates the private network port of the DB instance.
User	Indicates the name of the user who will access the DB instance. The default user is root .
Password	Indicates the password of the RDS database account.

Step 4 In the displayed window, select the connection that you have created in [Figure 1-31](#) and click **Open**.

If the connection information is correct, the DB instance is successfully connected.

Figure 1-31 Opening a session




NOTE

If the connection fails, ensure that preparations have been correctly made in [Preparations](#) and try again.


----End

Using SSL to Connect to a DB Instance

Step 1 Log in to the management console.

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

Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

Step 4 In the **DB Information** area on the **Basic Information** page, click  in the **SSL** field to download the root certificate or certificate bundle.

Step 5 Import the root certificate to the Linux OS on the ECS. For details, see [How Can I Import the Root Certificate to the Windows or Linux OS?](#)

NOTE

- Since April 2017, RDS has offered a new root certificate that has a 20-year validation period. The new certificate takes effect after DB instances are rebooted. Replace the old certificate before it expires to improve system security.
For details, see [How Can I Identify the Validity Period of the SSL Root Certificate?](#)
- You can also download the certificate bundle, which contains both the new certificate provided since April 2017 and the old certificate.

Step 6 Connect to an RDS DB instance. The Linux OS is used as an example.

```
mysql -h <hostName> -P <port> -u <userName> -p --ssl-ca=<caName>
```

Table 1-31 Parameter description

Parameter	Description
<hostName>	Indicates the EIP of the DB instance to be connected.
<port>	Indicates the port of the DB instance to be connected.
<userName>	Indicates the username of the RDS database account. The default administrator is root .
<caName>	Indicates the name of the SSL certificate file, which should be stored in the same directory where the command is executed.

For example, to connect to a DB instance through an SSL connection as user **root**, run the following command:

```
mysql -h 172.16.0.31 -P 3306 -u root -p --ssl-ca=ca.pem
```

Enter the password of the database account if the following information is displayed:

Enter password:

NOTE

If the connection fails, ensure that preparations have been correctly made in [Preparations](#) and try again.

----End

FAQs

[What Should I Do If I Fail to Connect to an RDS DB Instance?](#)

Follow-up Operations

After logging in to the DB instance, you can create or migrate databases.

- [Creating a MySQL Database Using the Console](#)
- [Creating a MySQL Database Using an API](#)
- [Managing MySQL Databases Using DAS](#)
- [Migrating MySQL Databases Using DRS](#)
- [Migrating MySQL Databases Using mysqldump](#)

2 Getting Started with RDS for PostgreSQL

2.1 Connecting to a DB Instance

An RDS DB instance can be connected through a private network, the Data Admin Service (DAS) service, or a public network.

Table 2-1 RDS connection methods

Connect Through	IP Address	Scenarios	Description
DAS	No IP address is required. You can log in to the DAS console and use RDS directly.	DAS enables you to manage databases on a web-based console and supports SQL execution, advanced database management, and intelligent O&M, simplifying database management and improving working efficiency and data security. The permissions required for connecting to DB instances through DAS are enabled by default.	<ul style="list-style-type: none"> • Easy to use, secure, advanced, and intelligent • Recommended
Private network	Floating IP	<p>RDS provides a floating IP address by default.</p> <p>When your applications are deployed on an ECS that is in the same region and VPC as RDS, you are advised to use a floating IP address to connect to the RDS DB instance through the ECS.</p>	<ul style="list-style-type: none"> • Secure and excellent performance • Recommended

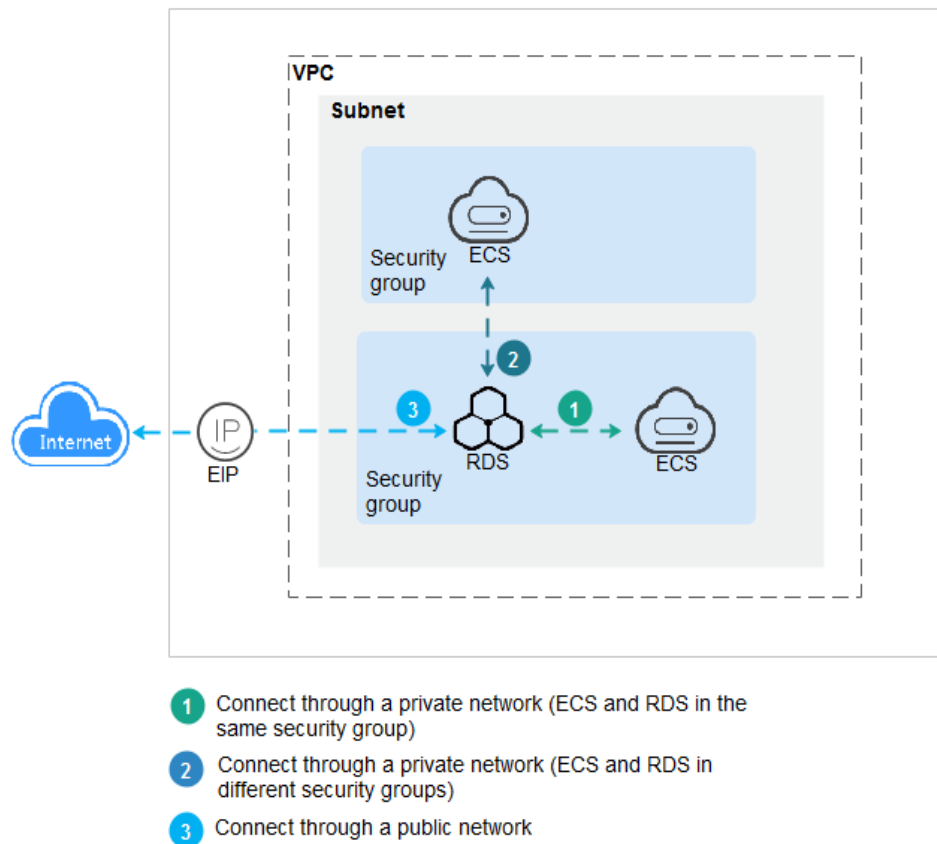
Connect Through	IP Address	Scenarios	Description
Public network	EIP	If you cannot access an RDS DB instance through a floating IP address, bind an EIP to the DB instance and connect the DB instance to the ECS through the EIP.	<ul style="list-style-type: none"> • A relatively lower level of security compared to other connection methods • To achieve a higher transmission rate and security level, you are advised to migrate your applications to an ECS that is in the same subnet as your RDS DB instance and use a floating IP address to access the DB instance. • You need to purchase an EIP. For pricing details, see EIP billing details.

 **NOTE**

- VPC: indicates the Virtual Private Cloud.
- ECS: indicates the Elastic Cloud Server.
- You can log in to DB instances using the Data Admin Service (DAS) service or other database clients.
- If the ECS is in the same VPC as your RDS DB instance, you do not need to apply for an EIP.

Figure 2-1 illustrates the connection over a private network or a public network.

Figure 2-1 DB instance connection



Connecting to DB Instances Running Other DB Engines

- [Connecting to a MySQL DB Instance](#)
- [Connecting to a Microsoft SQL Server DB Instance](#)

2.2 Connecting to a DB Instance Through DAS

2.2.1 Overview

Scenarios

With DAS, you can perform SQL executions, advanced database management, and intelligent O&M on a web-based console, which simplifies database management and improves working efficiency and data security. The permission of connecting DB instances through DAS is enabled by default.

This section describes how to buy a PostgreSQL DB instance on the management console and connect to the DB instance through DAS. If you are using RDS for the first time, see the constraints described in section [PostgreSQL Constraints](#).

Process

To connect to a DB instance through DAS:

- **Step 1: Buy a DB instance.** Confirm the specifications, storage, network, and database account configurations of the PostgreSQL DB instances based on service requirements.
- **Step 2: Connect to a DB instance through DAS.** Use DAS to connect to and manage the DB instance.

2.2.2 Step 1: Buy a DB Instance

Scenarios

This section describes how to create a DB instance on the RDS console.

Currently, RDS for PostgreSQL supports the yearly/monthly and pay-per-use billing modes. RDS allows you to tailor your computing resources and storage space to your business needs.

Prerequisites

- You have registered a HUAWEI CLOUD account.
- After registering a HUAWEI CLOUD account, you can create an IAM user or user group on the IAM console and grant it specific operation permissions, to perform refined management on HUAWEI CLOUD. For details, see [Creating a User and Granting Permissions](#).
- Your account balance is greater than or equal to ¥0.

Procedure


- Step 1** Log in to the management console.
- Step 2** Click  in the upper left corner and select a region and a project.
- Step 3** Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.
- Step 4** On the **Instance Management** page, click **Buy DB Instance**.
- Step 5** On the displayed page, select a billing mode, configure information about your DB instance. Then, click **Next**.

Figure 2-2 Billing mode and basic information

The screenshot shows the configuration page for a new RDS instance. The 'Billing Mode' is set to 'Yearly/Monthly'. The 'Region' is selected as 'ap-east-1'. The 'DB Instance Name' is 'instance-0001'. The 'DB Engine' is 'PostgreSQL'. The 'DB Engine Version' is '12'. The 'DB Instance Type' is 'Primary/Standby'. The 'Storage Type' is 'Ultra-high I/O'. The 'Primary AZ' is 'az3'. The 'Standby AZ' is 'az1'. The 'Time Zone' is 'UTC+08:00 Beijing, Chongqing, Hong K...'. There are help icons and explanatory text for several options.

RDS provides the following billing modes:

Yearly/Monthly

If you select this billing mode, skip **Step 6** and go to **Step 7**.

Pay-per-use

If you select this billing mode, go to **Step 6**.

Table 2-2 Basic information

Parameter	Description
Region	<p>The region your RDS resources will be located. You can change it on the creation page, or go back to the Instance Management page and change it in the upper left corner.</p> <p>NOTE Products in different regions cannot communicate with each other through a private network and you cannot change the region of a DB instance after creating the instance. Therefore, exercise caution when selecting a region.</p>

Parameter	Description
DB Instance Name	<p>Must start with a letter and consist of 4 to 64 characters. Only letters, digits, hyphens (-), and underscores (_) are allowed.</p> <ul style="list-style-type: none"> • If you intend to create multiple DB instances and read replicas, the length of each DB name will change. • If you create multiple DB instances at a time, they will be named with four digits appended to the DB instance name. For example, if you enter instance, the first instance will be named as instance-0001, the second as instance-0002, and so on.
DB Engine	Set to PostgreSQL .
DB Engine Version	<p>For details, see DB Engines and Versions.</p> <p>Different DB engine versions are supported in different regions.</p> <p>If you use a PostgreSQL database, select a proper DB engine version based on service requirements. You are advised to select the latest available version because it is more stable, reliable, and secure. PostgreSQL 9.5 will be end of maintenance (EOM) on February 11, 2021. Select a later version.</p>

Parameter	Description
DB Instance Type	<ul style="list-style-type: none"> ● Primary/Standby: uses the HA architecture with a primary DB instance and a synchronous standby DB instance. It is suitable for production databases of large- and medium-sized enterprises in Internet, Internet of Things (IoT), retail e-commerce sales, logistics, gaming, and other sectors. The standby DB instance improves instance reliability and is invisible to you after being created. An AZ is a physical region where resources use independent power supply and networks. AZs are physically isolated but interconnected through an internal network. Some regions support both single AZs and multiple AZs and some only support single AZs. To achieve higher reliability, RDS will automatically deploy your primary and standby instances in different physical servers even if you deploy primary/standby DB instances in the same AZ. If you attempt to create primary/standby DB 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. <ul style="list-style-type: none"> - If they are the same (default setting), the primary and standby DB instances are deployed in the same AZ. - If they are different, the primary and standby DB instances are deployed in different AZs to ensure failover support and high availability. ● Single: uses the single-node architecture, which is more cost-effective than mainstream primary/standby DB instances. It is suitable for developing and testing of microsites, and small- and medium-sized enterprises, or for learning about RDS.
Storage Type	<p>Determines the DB instance read/write speed. The higher the maximum throughput is, the higher the DB instance read/write speed can be.</p> <ul style="list-style-type: none"> ● Ultra-high I/O: supports a maximum throughput of 350 MB/s. <p>NOTE If you select DSS for Resource Type, only the storage type that you have selected when buying the DSS service is displayed by default.</p>
Time Zone	<p>Select a time zone when you are creating a DB instance, and you can change it after the DB instance is created.</p>

Figure 2-3 DB instance specifications

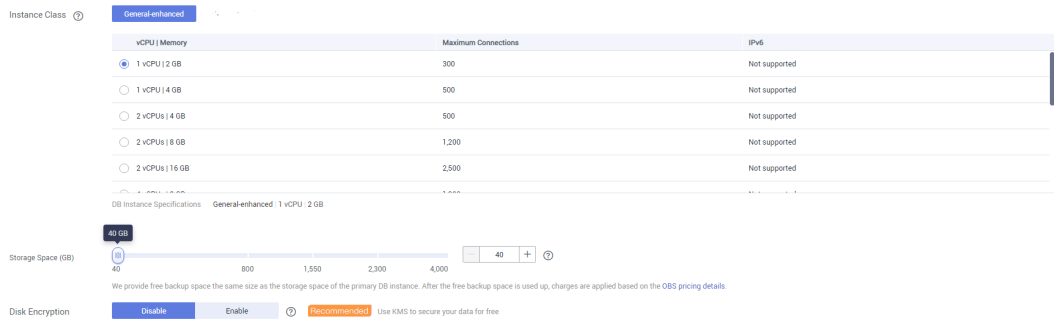


Table 2-3 Instance specifications

Parameter	Description
Instance Class	<p>Refers to the CPU and memory of a DB instance. Different instance classes have different numbers of database connections and different maximum IOPS.</p> <p>For details about instance classes, see DB Instance Classes.</p> <p>After a DB instance is created, you can change its CPU and memory. For details, see Changing a DB Instance Class.</p> <p>NOTE DB instances in a DCC only support the general-enhanced instance class.</p>
Resource Type	<ul style="list-style-type: none"> • EVS • DSS <p>NOTE This option is displayed only when you buy the DSS service.</p>
Storage Pool	<p>Displayed only when you select DSS for Resource Type. The storage pool is secure because it is physically isolated from other pools.</p>
Storage Space (GB)	<p>Contains the file system overhead required for inode, reserved block, and database operation. Can range in size from 40 GB to 4,000 GB and can be scaled up only by a multiple of 10 GB.</p> <p>After a DB instance is created, you can scale up its storage space. For details, see Scaling Up Storage Space.</p>

Parameter	Description
Disk Encryption	<ul style="list-style-type: none"> • Disabled: indicates the encryption function is disabled. • Enabled: indicates the encryption function is enabled, improving data security but affecting system performance. <p>Key Name: indicates the tenant key. You can create or select a key.</p> <p>NOTE</p> <ul style="list-style-type: none"> - Once the DB instance is created, you cannot modify the disk encryption status or change the key. The backup data stored in OBS is not encrypted. - After an RDS DB instance is created, do not disable or delete the key that is being used. Otherwise, RDS will be unavailable and data cannot be restored. - For details about how to create a key, see the "Creating a CMK" section in the <i>Data Encryption Workshop User Guide</i>.

Table 2-4 Database Security Service

Parameter	Description
DBSS	<p>Prevents database attacks, ensuring database security on the cloud.</p> <ul style="list-style-type: none"> • After you subscribe to Database Security Service (DBSS), you cannot buy DB instances in patches. • Only DB instances of certain specifications support the purchase of RDS and DBSS together. • The DBSS administrator is admin, and the password is the same as that of the RDS root user. • After you subscribe to DBSS, log in to the DBSS console, associate an EIP with the DBSS instance and configure security protection.

Figure 2-4 Network and database configuration

The screenshot shows the configuration interface for an RDS PostgreSQL instance. It includes sections for VPC and Subnet selection, Security Group configuration, password and administrator password setup, parameter template selection, enterprise project assignment, tagging options, required duration (set to 1 year), and quantity (set to 1). A warning message states: "After the RDS instance is created, the VPC cannot be changed. EC2s in different VPCs cannot communicate with each other by default. If you want to create a VPC, go to the VPC console. Available Private IP Addresses: 220."

Table 2-5 Network

Parameter	Description
VPC	<p>A dedicated virtual network in which your RDS DB instances are located. A VPC can isolate networks for different services. You can select an existing VPC or create a VPC. For details on how to create a VPC, see the "Creating a VPC" section in the <i>Virtual Private Cloud User Guide</i>.</p> <p>If no VPC is available, RDS allocates a VPC for you by default.</p> <p>NOTICE After the DB instance is created, the VPC cannot be changed.</p>
Subnet	<p>Improves network security by providing dedicated network resources that are logically isolated from other networks. Subnets take effect only within an AZ. The Dynamic Host Configuration Protocol (DHCP) function is enabled by default for subnets in which you plan to create RDS DB instances and cannot be disabled.</p> <p>A floating IP address is automatically assigned when you create a DB instance. You can also enter an unused floating IP address in the subnet CIDR block. After the DB instance is created, you can change the floating IP address.</p>
Security Group	<p>Controls the access that traffic has in and out of a DB instance. By default, the security group associated with the DB instance is authorized.</p> <p>Enhances security by controlling access to RDS from other services. You need to add rules to a security group so that you can connect to your DB instance.</p> <p>If no security group is available, RDS allocates a security group to you by default.</p>

Table 2-6 Database configuration

Parameter	Description
Password	<ul style="list-style-type: none"> • Configure (default value): Configure the password when you are creating the DB instance. • Skip: The system does not set an initial password for you. <p>NOTICE To log in, you will have to reset a password for the DB instance.</p> <p>After a DB instance is created, you can reset the password. For details, see Resetting the Administrator Password.</p>
Administrator	The default login name for the database is root .
Administrator Password	<p>Must consist of 8 to 32 characters and contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters (~!@#%&^*-_+=?,). Enter a strong password. Periodically change it to improve security and prevent security risks such as brute force cracking.</p> <p>Keep this password secure. The system cannot retrieve it.</p> <p>After a DB instance is created, you can reset this password. For details, see Resetting the Administrator Password.</p>
Confirm Password	Must be the same as Administrator Password .
Parameter Template	<p>Contains engine configuration values that can be applied to one or more DB instances. If you intend to create primary/standby DB instances, they use the same parameter template. You can modify instance parameters as required after the DB instance is created.</p> <p>NOTICE If you use a custom parameter template when creating a DB instance, the following specification-related parameters in the custom template are not delivered. Instead, the default values are used.</p> <ul style="list-style-type: none"> • maintenance_work_mem • shared_buffers • max_connections • effective_cache_size <p>You can modify the instance parameters as required after the DB instance is created. For details, see section Modifying Parameters in a Parameter Template.</p>

Parameter	Description
Enterprise Project	<p>If the DB instance has been associated with an enterprise project, select the target project from the Enterprise Project drop-down list.</p> <p>You can also go to the ProjectMan console to create a project. For details about how to create a project, see the <i>ProjectMan User Guide</i>.</p>

Table 2-7 Tags

Parameter	Description
Tag	<p>Tags an RDS DB instance. This configuration is optional. Adding tags to RDS DB instances helps you better identify and manage the DB instances. A maximum of 10 tags can be added for each DB instance.</p> <p>After a DB instance is created, you can view its tag details on the Tags page. For detailed operations, see Managing Tags.</p>

Table 2-8 Purchase period

Parameter	Description
Required Duration	<p>This option is available only for yearly/monthly DB instances. The system will automatically calculate the configuration fee based on the selected required duration. The longer the required duration is, the larger discount you will enjoy.</p>
Auto-renew	<ul style="list-style-type: none"> This option is available only for yearly/monthly DB instances and is not selected by default. If you select this option, the auto-renew cycle is determined by the selected required duration.
Quantity	<p>RDS supports batch creation of DB instances. If you intend to create primary/standby DB instances and set Quantity to 1, a primary DB instance and a synchronous standby DB instance will be created.</p>

If you have any questions about the price, click **Pricing details** at the bottom of the page.

 **NOTE**

The performance of your DB instance depends on its configurations. Hardware configuration items include the instance specifications, storage type, and storage space.

Step 6 Confirm the specifications for pay-per-use DB instances.

Figure 2-5 Specifications confirmation

Resource	Configuration	Billing Mode	Quantity	Price
DB Instance	Billing Mode: Pay-per-use Region: <input type="text"/> DB Instance Name: <input type="text"/> DB Engine: PostgreSQL DB Engine Version: 12 DB Instance Type: Primary/Standby Primary AZ: az3 Standby AZ: az3 Instance Specifications: General-enhanced 1 vCPU 2 GB, Maximum Connections: 300 Storage Type: Ultra-high I/O Storage Space: 40 GB Time Zone: UTC+08:00 Disk Encryption: Disabled VPC: default_vpc Subnet: subnet-8efb192-168.2.0/24 Floating IP Address: Automatically assigned Security Group: default_securitygroup (Inbound: TCP(21, 20-21, 20, 18, 22, 22, 22, --, --, 20-21, 22, --, 22; ICMP(8, --, 8-0, --, --, UDP(8, --, 30) Outbound: --) Parameter Template: Default-PostgreSQL-12	Pay-per-use	1	/hour

- If you need to modify your settings, click **Previous**.
- If you do not need to modify your settings, click **Submit**.

Skip **Step 7** and **Step 8** and go to **Step 9**.

Step 7 Confirm the order for yearly/monthly DB instances.

Figure 2-6 Order confirmation

Resource	Configuration	Billing Mode	Required Duration	Quantity	Price
DB Instance	Billing Mode: Yearly/Monthly Region: <input type="text"/> DB Instance Name: <input type="text"/> DB Engine: PostgreSQL DB Engine Version: 12 DB Instance Type: Primary/Standby Primary AZ: az3 Standby AZ: az3 Instance Specifications: General-enhanced 1 vCPU 2 GB, Maximum Connections: 300 Storage Type: Ultra-High I/O Storage Space: 40 GB Time Zone: UTC+08:00 Disk Encryption: Disabled VPC: default_vpc Subnet: subnet-8efb192-168.2.0/24 Floating IP Address: Automatically assigned Security Group: default_securitygroup (Inbound: TCP(21, 20-21, 20, 18, 22, 22, 22, --, --, 20-21, 22, --, 22; ICMP(8, --, 8-0, --, --, UDP(8, --, 30) Outbound: --) Parameter Template: Default-PostgreSQL-12	Yearly/Monthly	1 year	1	

- If you need to modify your settings, click **Previous**.
- If you do not need to modify your settings, click **Pay Now**.

Step 8 Select a payment method and complete the payment.

NOTE

This operation applies only to the yearly/monthly billing mode.

Step 9 To view and manage the DB instance, go to the **Instance Management** page.

- During the creation process, the DB instance status is **Creating**.
- To refresh the DB instance list, click in the upper right corner of the list. When the creation process is complete, the instance status will change to **Available**.
- The automated backup policy is enabled by default. After the DB instance is created, you can modify the policy as needed. An automated full backup is immediately triggered after a DB instance is created.
- After a DB instance is created, you can enter a description for it.

- The default database port is **5432**. After a DB instance is created, you can change the database port.

 **NOTE**

You are advised to change the database port in a timely manner.
For details, see [Changing the Database Port](#).

----End

Related Operations

[Creating a DB Instance Using an API](#)

2.2.3 Step 2: Connect to a DB instance through DAS

Scenarios

DAS enables you to manage databases on a web-based console and supports SQL execution, advanced database management, and intelligent O&M, simplifying database management and improving working efficiency and data security. The permission of connecting DB instances through DAS is enabled by default. You are advised to use this connection method.

Procedure

Step 1 Log in to the management console.

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

Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

Step 4 On the **Instance Management** page, locate the target DB instance and click **Log In** in the **Operation** column.

Alternatively, click the target DB instance on the **Instance Management** page. On the displayed **Basic Information** page, click **Log In** in the upper right corner of the page.

Step 5 On the displayed login page, enter the correct username and password and click **Log In**.

----End

Follow-up Operations

After logging in to the DB instance, you can create or migrate databases.

- [Creating a PostgreSQL Database Using an API](#)
- [Managing PostgreSQL Databases Using DAS](#)
- [Migrating PostgreSQL Databases Using DRS](#)
- [Migrating PostgreSQL Databases Using psql](#)

2.3 Connecting to a PostgreSQL DB Instance Through a Private Network

2.3.1 Overview

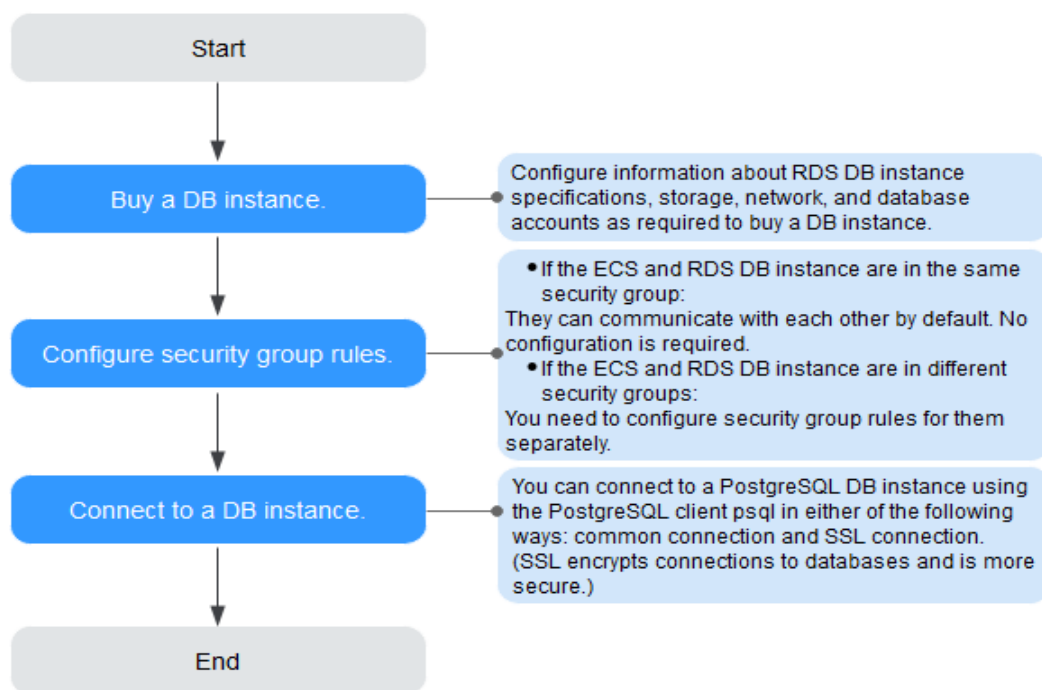
This section describes how to buy a DB instance on the management console and connect to the DB instance through an ECS.

If you are using RDS for the first time, see the constraints described in section [PostgreSQL Constraints](#).

Process

Figure 2-7 illustrates the process of connecting to a PostgreSQL DB instance through a private network.

Figure 2-7 Connecting to a DB instance through a private network



- **Step 1: Buy a DB instance.** Confirm the specifications, storage, network, and database account configurations of the PostgreSQL DB instances based on service requirements.
- **Step 2: Configure security group rules.**
 - If the ECS and RDS DB instance are in the same security group, they can communicate with each other by default. No security group rule needs to be configured. Go to **Step 3: Connect to a DB Instance Through `psql`**.
 - If the ECS and RDS DB instance are in different security groups, you need to configure security group rules for them, separately.

- RDS DB instance: Configure an **inbound rule** for the security group with which the RDS DB instance is associated.
- ECS: The default security group rule allows all outgoing data packets. In this case, you do not need to configure a security rule for the ECS. If not all outbound traffic is allowed in the security group, you need to configure an **outbound rule** for the ECS.
- **Step 3: Connect to a DB instance through a private network.** You can connect to a DB instance through a common connection or an SSL connection. The SSL connection encrypts data and is more secure. The CLI tool `psql` is used as an example to describe the connection method.

2.3.2 Step 1: Buy a DB Instance

Scenarios

This section describes how to create a DB instance on the RDS console.

Currently, RDS for PostgreSQL supports the yearly/monthly and pay-per-use billing modes. RDS allows you to tailor your computing resources and storage space to your business needs.

Prerequisites

- You have registered a HUAWEI CLOUD account.
- After registering a HUAWEI CLOUD account, you can create an IAM user or user group on the IAM console and grant it specific operation permissions, to perform refined management on HUAWEI CLOUD. For details, see [Creating a User and Granting Permissions](#).
- Your account balance is greater than or equal to ¥0.

Procedure


- Step 1** Log in to the management console.
- Step 2** Click  in the upper left corner and select a region and a project.
- Step 3** Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.
- Step 4** On the **Instance Management** page, click **Buy DB Instance**.
- Step 5** On the displayed page, select a billing mode, configure information about your DB instance. Then, click **Next**.

Figure 2-8 Billing mode and basic information

The screenshot shows the configuration page for a new RDS instance. The 'Billing Mode' is set to 'Yearly/Monthly'. The 'Region' is selected from a dropdown menu. Below this, there is a note: 'Regions are geographic areas isolated from each other. Resources are region-specific and cannot be used across regions through internal network connections. For low network latency and quick resource access, select the nearest region.'

The 'DB Instance Name' field is empty. A note below it states: 'If you buy multiple DB instances at a time, they will be named with four digits appended in the format "DB instance name-SN". For example, if the DB instance name is instance, the first instance will be named as instance-0001, the second as instance-0002, and so on.'

The 'DB Engine' is set to 'PostgreSQL'. Other options are 'MySQL' and 'Microsoft SQL Server'. A link 'Learn more about DB engines and versions.' is provided.

The 'DB Engine Version' is set to '12'. Other options are '11', '10', '9.6', '9.5', and 'Enhanced Edition'.

The 'DB Instance Type' is set to 'Primary/Standby'. Another option is 'Single'. A note below it states: 'Primary/standby HA architecture is suitable for production databases in large- and medium-sized enterprises, or for applications in Internet, IoT, retail e-commerce, logistics, and gaming industries.'

The 'Storage Type' is set to 'Ultra-high I/O'. Other options are 'Common I/O' and 'High I/O'. A link 'Learn more about storage types.' is provided.

The 'Primary AZ' is set to 'az3'. Other options are 'az1' and 'az2'.

The 'Standby AZ' is set to 'az3'. Other options are 'az1' and 'az2'. A note below it states: 'Multi-AZ deployment provides disaster recovery capabilities across AZs.'

The 'Time Zone' is set to 'UTC+08:00 Beijing, Chongqing, Hong K...'.

RDS provides the following billing modes:

Yearly/Monthly

If you select this billing mode, skip [Step 6](#) and go to [Step 7](#).

Pay-per-use

If you select this billing mode, go to [Step 6](#).

Table 2-9 Basic information

Parameter	Description
Region	<p>The region your RDS resources will be located. You can change it on the creation page, or go back to the Instance Management page and change it in the upper left corner.</p> <p>NOTE Products in different regions cannot communicate with each other through a private network and you cannot change the region of a DB instance after creating the instance. Therefore, exercise caution when selecting a region.</p>

Parameter	Description
DB Instance Name	<p>Must start with a letter and consist of 4 to 64 characters. Only letters, digits, hyphens (-), and underscores (_) are allowed.</p> <ul style="list-style-type: none"> • If you intend to create multiple DB instances and read replicas, the length of each DB name will change. • If you create multiple DB instances at a time, they will be named with four digits appended to the DB instance name. For example, if you enter instance, the first instance will be named as instance-0001, the second as instance-0002, and so on.
DB Engine	Set to PostgreSQL .
DB Engine Version	<p>For details, see DB Engines and Versions.</p> <p>Different DB engine versions are supported in different regions.</p> <p>If you use a PostgreSQL database, select a proper DB engine version based on service requirements. You are advised to select the latest available version because it is more stable, reliable, and secure. PostgreSQL 9.5 will be end of maintenance (EOM) on February 11, 2021. Select a later version.</p>

Parameter	Description
DB Instance Type	<ul style="list-style-type: none"> ● Primary/Standby: uses the HA architecture with a primary DB instance and a synchronous standby DB instance. It is suitable for production databases of large- and medium-sized enterprises in Internet, Internet of Things (IoT), retail e-commerce sales, logistics, gaming, and other sectors. The standby DB instance improves instance reliability and is invisible to you after being created. An AZ is a physical region where resources use independent power supply and networks. AZs are physically isolated but interconnected through an internal network. Some regions support both single AZs and multiple AZs and some only support single AZs. To achieve higher reliability, RDS will automatically deploy your primary and standby instances in different physical servers even if you deploy primary/standby DB instances in the same AZ. If you attempt to create primary/standby DB 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. <ul style="list-style-type: none"> - If they are the same (default setting), the primary and standby DB instances are deployed in the same AZ. - If they are different, the primary and standby DB instances are deployed in different AZs to ensure failover support and high availability. ● Single: uses the single-node architecture, which is more cost-effective than mainstream primary/standby DB instances. It is suitable for developing and testing of microsites, and small- and medium-sized enterprises, or for learning about RDS.
Storage Type	<p>Determines the DB instance read/write speed. The higher the maximum throughput is, the higher the DB instance read/write speed can be.</p> <ul style="list-style-type: none"> ● Ultra-high I/O: supports a maximum throughput of 350 MB/s. <p>NOTE If you select DSS for Resource Type, only the storage type that you have selected when buying the DSS service is displayed by default.</p>
Time Zone	<p>Select a time zone when you are creating a DB instance, and you can change it after the DB instance is created.</p>

Figure 2-9 DB instance specifications

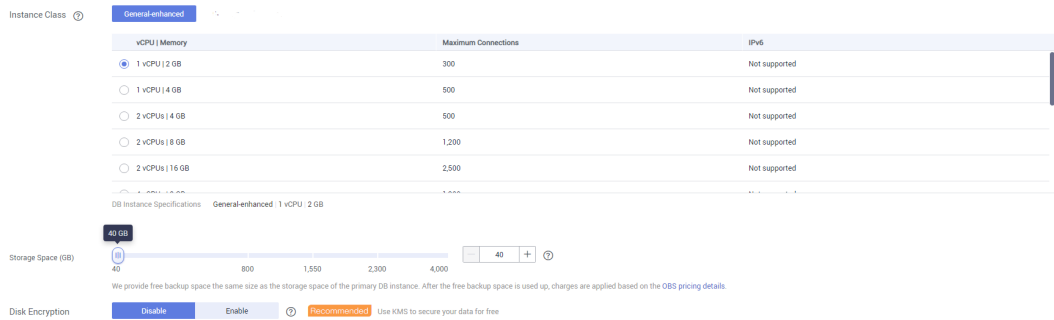


Table 2-10 Instance specifications

Parameter	Description
Instance Class	<p>Refers to the CPU and memory of a DB instance. Different instance classes have different numbers of database connections and different maximum IOPS.</p> <p>For details about instance classes, see DB Instance Classes.</p> <p>After a DB instance is created, you can change its CPU and memory. For details, see Changing a DB Instance Class.</p> <p>NOTE DB instances in a DCC only support the general-optimized instance class.</p>
Resource Type	<ul style="list-style-type: none"> • EVS • DSS <p>NOTE This option is displayed only when you buy the DSS service.</p>
Storage Pool	<p>Displayed only when you select DSS for Resource Type. The storage pool is secure because it is physically isolated from other pools.</p>
Storage Space (GB)	<p>Contains the file system overhead required for inode, reserved block, and database operation. Can range in size from 40 GB to 4,000 GB and can be scaled up only by a multiple of 10 GB.</p> <p>After a DB instance is created, you can scale up its storage space. For details, see Scaling Up Storage Space.</p>

Parameter	Description
Disk Encryption	<ul style="list-style-type: none"> • Disabled: indicates the encryption function is disabled. • Enabled: indicates the encryption function is enabled, improving data security but affecting system performance. <p>Key Name: indicates the tenant key. You can create or select a key.</p> <p>NOTE</p> <ul style="list-style-type: none"> - Once the DB instance is created, you cannot modify the disk encryption status or change the key. The backup data stored in OBS is not encrypted. - After an RDS DB instance is created, do not disable or delete the key that is being used. Otherwise, RDS will be unavailable and data cannot be restored. - For details about how to create a key, see the "Creating a CMK" section in the <i>Data Encryption Workshop User Guide</i>.

Table 2-11 Database Security Service

Parameter	Description
DBSS	<p>Prevents database attacks, ensuring database security on the cloud.</p> <ul style="list-style-type: none"> • After you subscribe to Database Security Service (DBSS), you cannot buy DB instances in patches. • Only DB instances of certain specifications support the purchase of RDS and DBSS together. • The DBSS administrator is admin, and the password is the same as that of the RDS root user. • After you subscribe to DBSS, log in to the DBSS console, associate an EIP with the DBSS instance and configure security protection.

Figure 2-10 Network and database configuration

The screenshot shows the configuration page for an RDS instance. At the top, there's a section for 'Relationship among VPCs, subnets, security groups, and DB instances'. It includes dropdowns for VPC (vpc-02), Subnet (subnet-02), and Security Group (sg-02). Below this is a 'Password' section with 'Configure' and 'Skip' buttons, and fields for Administrator (root), Administrator Password, and Confirm Password. The 'Parameter Template' is set to 'Default-PostgreSQL-12' and the 'Enterprise Project' is 'default'. There's a 'Tag' section with input fields for 'Tag key' and 'Tag value'. The 'Required Duration' is set to '1 year' and 'Quantity' is '1'. A note at the bottom states: 'The total number of primary DB instances and read replicas cannot exceed 50. Increase quota'.

Table 2-12 Network

Parameter	Description
VPC	<p>A dedicated virtual network in which your RDS DB instances are located. A VPC can isolate networks for different services. You can select an existing VPC or create a VPC. For details on how to create a VPC, see the "Creating a VPC" section in the <i>Virtual Private Cloud User Guide</i>.</p> <p>If no VPC is available, RDS allocates a VPC for you by default.</p> <p>NOTICE After the DB instance is created, the VPC cannot be changed.</p>
Subnet	<p>Improves network security by providing dedicated network resources that are logically isolated from other networks. Subnets take effect only within an AZ. The Dynamic Host Configuration Protocol (DHCP) function is enabled by default for subnets in which you plan to create RDS DB instances and cannot be disabled.</p> <p>A floating IP address is automatically assigned when you create a DB instance. You can also enter an unused floating IP address in the subnet CIDR block. After the DB instance is created, you can change the floating IP address.</p>
Security Group	<p>Controls the access that traffic has in and out of a DB instance. By default, the security group associated with the DB instance is authorized.</p> <p>Enhances security by controlling access to RDS from other services. You need to add rules to a security group so that you can connect to your DB instance.</p> <p>If no security group is available, RDS allocates a security group to you by default.</p>

Table 2-13 Database configuration

Parameter	Description
Password	<ul style="list-style-type: none"> • Configure (default value): Configure the password when you are creating the DB instance. • Skip: The system does not set an initial password for you. <p>NOTICE To log in, you will have to reset a password for the DB instance.</p> <p>After a DB instance is created, you can reset the password. For details, see Resetting the Administrator Password.</p>
Administrator	The default login name for the database is root .
Administrator Password	<p>Must consist of 8 to 32 characters and contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters (~!@#%&^*-_+=?,). Enter a strong password. Periodically change it to improve security and prevent security risks such as brute force cracking.</p> <p>Keep this password secure. The system cannot retrieve it.</p> <p>After a DB instance is created, you can reset this password. For details, see Resetting the Administrator Password.</p>
Confirm Password	Must be the same as Administrator Password .
Parameter Template	<p>Contains engine configuration values that can be applied to one or more DB instances. If you intend to create primary/standby DB instances, they use the same parameter template. You can modify instance parameters as required after the DB instance is created.</p> <p>NOTICE If you use a custom parameter template when creating a DB instance, the following specification-related parameters in the custom template are not delivered. Instead, the default values are used.</p> <ul style="list-style-type: none"> • maintenance_work_mem • shared_buffers • max_connections • effective_cache_size <p>You can modify the instance parameters as required after the DB instance is created. For details, see section Modifying Parameters in a Parameter Template.</p>

Parameter	Description
Enterprise Project	<p>If the DB instance has been associated with an enterprise project, select the target project from the Enterprise Project drop-down list.</p> <p>You can also go to the ProjectMan console to create a project. For details about how to create a project, see the <i>ProjectMan User Guide</i>.</p>

Table 2-14 Tags

Parameter	Description
Tag	<p>Tags an RDS DB instance. This configuration is optional. Adding tags to RDS DB instances helps you better identify and manage the DB instances. A maximum of 10 tags can be added for each DB instance.</p> <p>After a DB instance is created, you can view its tag details on the Tags page. For detailed operations, see Managing Tags.</p>

Table 2-15 Purchase period

Parameter	Description
Required Duration	<p>This option is available only for yearly/monthly DB instances. The system will automatically calculate the configuration fee based on the selected required duration. The longer the required duration is, the larger discount you will enjoy.</p>
Auto-renew	<ul style="list-style-type: none"> This option is available only for yearly/monthly DB instances and is not selected by default. If you select this option, the auto-renew cycle is determined by the selected required duration.
Quantity	<p>RDS supports batch creation of DB instances. If you intend to create primary/standby DB instances and set Quantity to 1, a primary DB instance and a synchronous standby DB instance will be created.</p>

If you have any questions about the price, click **Pricing details** at the bottom of the page.

 **NOTE**

The performance of your DB instance depends on its configurations. Hardware configuration items include the instance specifications, storage type, and storage space.

Step 6 Confirm the specifications for pay-per-use DB instances.

Figure 2-11 Specifications confirmation

Resource	Configuration	Billing Mode	Quantity	Price	
DB Instance	Billing Mode	Pay-per-use			
	Region				
	DB Instance Name				
	DB Engine	PostgreSQL			
	DB Engine Version	12			
	DB Instance Type	Primary/Standby			
	Primary AZ	az3			
	Standby AZ	az3			
	Instance Specifications	General-enhanced 1 vCPU 2 GB, Maximum Connections : 300			
	Storage Type	Ultra-high I/O	Pay-per-use	1	¥0.00/hour
	Storage Space	40 GB			
	Time Zone	UTC+08:00			
	Disk Encryption	Disabled			
	VPC	default_vpc			
	Subnet	subnet-8efb192.168.2.0/24			
Floating IP Address	Automatically assigned				
Security Group	default_securitygroup (Inbound: TCP/21, 20-21, 20, 18, 22, 22, 22, --, --, 20-31, 22, --, 22; ICMP/--, --, 8-0, --, --; UDP/--, 30 Outbound: --)				
Parameter Template	Default-PostgreSQL-12				

- If you need to modify your settings, click **Previous**.
- If you do not need to modify your settings, click **Submit**.

Skip **Step 7** and **Step 8** and go to **Step 9**.

Step 7 Confirm the order for yearly/monthly DB instances.

Figure 2-12 Order confirmation

Resource	Configuration	Billing Mode	Required Duration	Quantity	Price	
DB Instance	Billing Mode	Yearly/Monthly				
	Region					
	DB Instance Name					
	DB Engine	PostgreSQL				
	DB Engine Version	12				
	DB Instance Type	Primary/Standby				
	Primary AZ	az3				
	Standby AZ	az3				
	Instance Specifications	General-enhanced 1 vCPU 2 GB, Maximum Connections : 300				
	Storage Type	Ultra-High I/O	Yearly/Monthly	1 year	1	¥0.00
	Storage Space	40 GB				
	Time Zone	UTC+08:00				
	Disk Encryption	Disabled				
	VPC	default_vpc				
	Subnet	subnet-8efb192.168.2.0/24				
Floating IP Address	Automatically assigned					
Security Group	default_securitygroup (Inbound: TCP/21, 20-21, 20, 18, 22, 22, 22, --, --, 20-21, 22, --, 22; ICMP/--, --, 8-0, --, --; UDP/--, 30 Outbound: rd, --)					
Parameter Template	Default-PostgreSQL-12					


- If you need to modify your settings, click **Previous**.
- If you do not need to modify your settings, click **Pay Now**.

Step 8 Select a payment method and complete the payment.

NOTE

This operation applies only to the yearly/monthly billing mode.

Step 9 To view and manage the DB instance, go to the **Instance Management** page.

- During the creation process, the DB instance status is **Creating**.
- To refresh the DB instance list, click  in the upper right corner of the list. When the creation process is complete, the instance status will change to **Available**.
- The automated backup policy is enabled by default. After the DB instance is created, you can modify the policy as needed. An automated full backup is immediately triggered after a DB instance is created.
- After a DB instance is created, you can enter a description for it.

- The default database port is **5432**. After a DB instance is created, you can change the database port.

 **NOTE**

You are advised to change the database port in a timely manner.
For details, see [Changing the Database Port](#).

----End

Related Operations

[Creating a DB Instance Using an API](#)

2.3.3 Step 2: Configure Security Group Rules

Scenarios

A security group is a collection of access control rules for ECSs and RDS DB instances that have the same security protection requirements and are mutually trusted in a VPC.

This section describes how to create a security group to enable specific IP addresses and ports to access RDS.

Check whether the ECS and RDS DB instance are in the same security group.

- If the ECS and RDS DB instance are in the same security group, they can communicate with each other by default. No security group rule needs to be configured. Go to [Step 3: Connect to a DB Instance Through `psql`](#).
- If the ECS and RDS DB instance are in different security groups, you need to configure security group rules for them, separately.
 - RDS DB instance: Configure an **inbound rule** for the security group with which the RDS DB instance is associated.
 - ECS: The default security group rule allows all outgoing data packets. In this case, you do not need to configure a security rule for the ECS. If not all outbound traffic is allowed in the security group, you need to configure an **outbound rule** for the ECS.

This section describes how to configure an inbound rule for an RDS DB instance.

For details about the requirements of security group rules, see the [Adding a Security Group Rule](#) section in the *Virtual Private Cloud User Guide*.

Precautions

The default security group rule allows all outgoing data packets. ECSs and RDS DB instances can access each other if they are deployed in the same security group. After a security group is created, you can configure security group rules to control access from and to the DB instances in the security group.

- By default, you can create a maximum of 500 security group rules.
- One security group can be associated with only one RDS DB instance.

- Too many security group rules will increase the first packet latency. You are advised to create a maximum of 50 rules for each security group.
- To access an RDS DB instance from resources outside the security group, you need to configure an **inbound rule** for the security group associated with the RDS DB instance.

 **NOTE**

To ensure security of data and DB instances, you are advised to use the principle of least privilege for database access. Change the database port (default value: **3306**), and set the IP address to the remote server's address or any IP address in the remote server's smallest subnet to control the access scope of the remote server.

If you use **0.0.0.0/0**, you enable all IP addresses to access RDS DB instances in the security group.

For details about the requirements of security group rules, see the [Adding a Security Group Rule](#) section in the *Virtual Private Cloud User Guide*.

Procedure

Step 1 Log in to the management console.

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

Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

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

Step 5 Configure security group rules.

In the **Connection Information** area, click the security group.

Figure 2-13 Connection information



Step 6 On the inbound rule tab, click **Add Rule**. In the displayed dialog box, set required parameters to add an inbound rule.

You can click **+** to add more inbound rules.

Figure 2-14 Adding an inbound rule

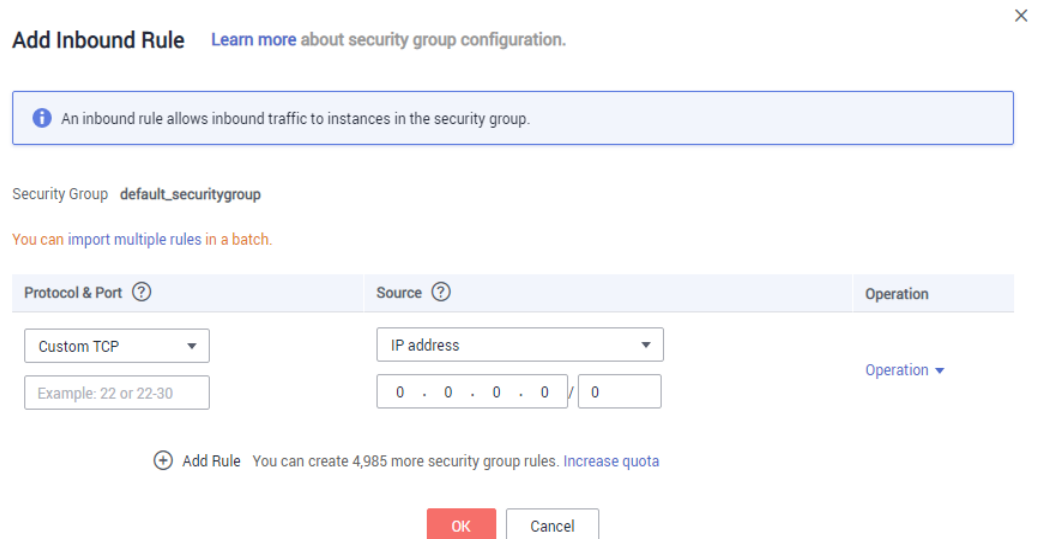


Table 2-16 Inbound rule parameter description

Parameter	Description	Example Value
Protocol & Port	Specifies the network protocol. Currently, the value can be All, TCP, UDP, ICMP, GRE , or others.	Custom TCP
	Port: specifies the port or port range over which the traffic can reach your ECS. The value ranges from 1 to 65535. Common ports are listed in Common Ports Used by ECSs .	When connecting to the DB instance through a private network, enter the port of the target DB instance.
Source	Specifies the source of the security group rule. The value can be another security group or a single IP address. For example: <ul style="list-style-type: none"> • xxx.xxx.xxx.xxx/32 (IPv4 address) • xxx.xxx.xxx.0/24 (subnet) • 0.0.0.0/0 (any IP address) 	0.0.0.0/0
Description	Provides supplementary information about the security group rule. This parameter is optional. The description can contain a maximum of 255 characters and cannot contain angle brackets (<) or (>).	-

----End

2.3.4 Step 3: Connect to a DB Instance Through psql

You can use the PostgreSQL client psql to connect to a DB instance through a common connection or an SSL connection. The SSL connection is encrypted and therefore more secure.

Preparations

1. To connect to a DB instance through an ECS, you need to create an ECS first.
For details about how to create and connect to an ECS, see [How Can I Create and Connect to an ECS?](#)
2. Install the PostgreSQL client on the prepared ECS or device.
For details, see [How Can I Install the PostgreSQL Client?](#)

Common Connection

Step 1 Log in to the ECS or the device that can access RDS.

Step 2 Run the following command to connect to the DB instance:

```
psql --no-readline -U <user> -h <host> -p <port> -d <datastore> -W
```

Table 2-17 Parameter description

Parameter	Description
<user>	Indicates the username of the RDS database account. The default administrator is root .
<host>	Indicates the IP address of the primary DB instance. To obtain this parameter, go to the Basic Information page of the DB instance. If the DB instance is accessed through the ECS, the IP address can be found in the Floating IP Address field in the Connection Information area.
<port>	Indicates the database port in use. The default value is 5432 . To obtain this parameter, go to the Basic Information page of the DB instance. The port number can be found in the Database Port field in the Connection Information area.
<datastore>	Indicates the name of the database (the default database name is postgres).



The parameter **-W** indicates that a password must be entered for the connection. After running this command, you will be prompted to enter a password.

Example:

Run the following command as user **root** to connect to a DB instance:

```
psql --no-readline -U root -h 192.168.0.44 -p 5432 -d postgres -W
----End
```

SSL Connection

- Step 1** Log in to the management console.
- Step 2** Click  in the upper left corner and select a region and a project.
- Step 3** Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.
- Step 4** In the **DB Information** area on the **Basic Information** page, click  in the **SSL** field to download the root certificate or certificate bundle.
- Step 5** Upload the root certificate to the ECS or save it to the device to be connected to the DB instance.

Import the root certificate to the Linux OS on the ECS. For details, see [How Can I Import the Root Certificate to the Windows or Linux OS?](#)

- Step 6** Connect to an RDS DB instance. The Linux OS is used as an example.

```
psql --no-readline -h <host> -p <port> "dbname=<database> user=<user>
sslmode=verify-ca sslrootcert=<ca-file-directory>"
```

Table 2-18 Parameter description

Parameter	Description
<i><host></i>	Indicates the IP address of the primary DB instance. To obtain this parameter, go to the Basic Information page of the DB instance. If the DB instance is accessed through the ECS, the IP address can be found in the Floating IP Address field in the Connection Information area.
<i><port></i>	Indicates the database port in use. The default value is 5432 . To obtain this parameter, go to the Basic Information page of the DB instance. The port number can be found in the Database Port field in the Connection Information area.
<i><database></i>	Indicates the name of the database (the default database name is postgres).
<i><user></i>	Indicates the username of the RDS database account. The default administrator is root .
<i><ca-file-directory></i>	Indicates the directory of the CA certificate for the SSL connection. The certificate should be stored in the directory where the command is executed.
sslmode	Indicates the SSL connection mode. Set it to verify-ca to use a CA to check whether the service is trusted.

Enter the password of the database account if the following information is displayed:

Password:

For example, to connect to a DB instance through an SSL connection as user **root**, run the following command:

```
psql --no-readline -h 192.168.0.44 -p 5432 "dbname=postgres user=root  
sslmode=verify-ca sslrootcert=/root/ca.pem"
```

Password:

Step 7 The SSL connection is established if information similar to the following is displayed after you log in to the database:

```
SSL connection (protocol: TLSv1.2, cipher: ECDHE-RSA-AES256-GCM-SHA384, bits: 256, compression: off)
```

```
----End
```

FAQs

[What Should I Do If I Fail to Connect to an RDS DB Instance?](#)

Follow-up Operations

After logging in to the DB instance, you can create or migrate databases.

- [Creating a PostgreSQL Database Using an API](#)
- [Managing PostgreSQL Databases Using DAS](#)
- [Migrating PostgreSQL Databases Using DRS](#)
- [Migrating PostgreSQL Databases Using psql](#)

2.4 Connecting to a PostgreSQL DB Instance Through a Public Network

2.4.1 Overview

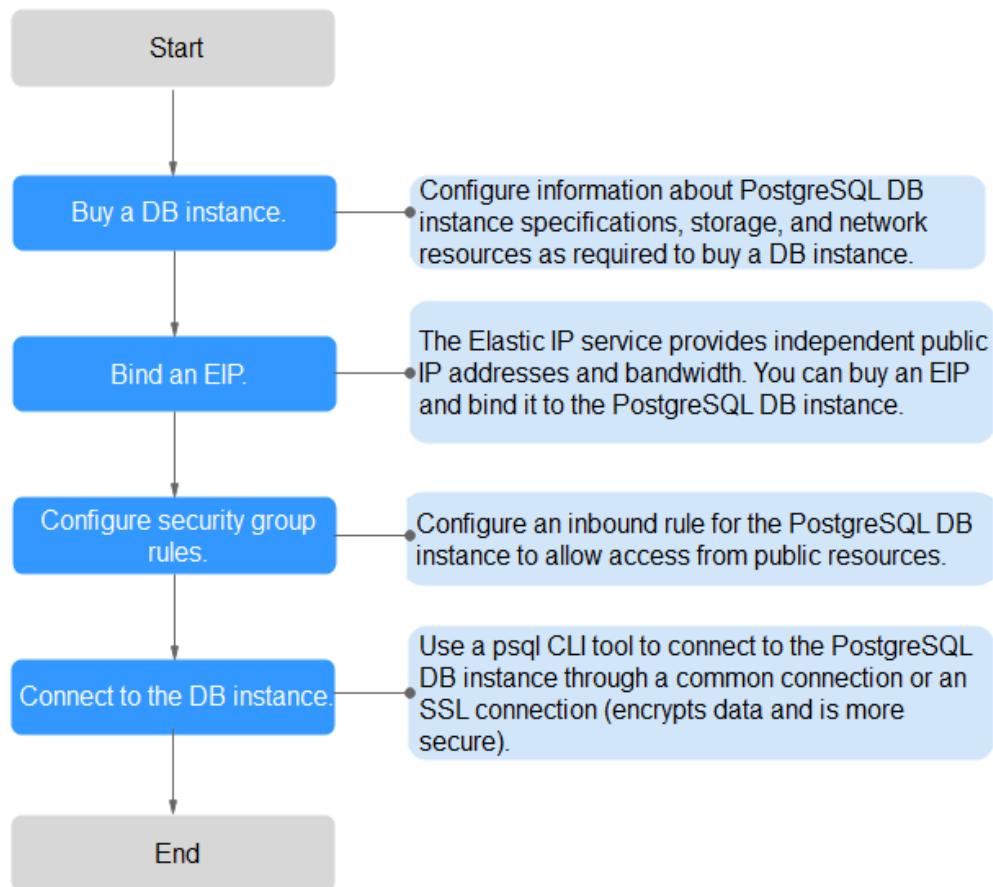
This section describes how to buy a PostgreSQL DB instance on the management console and bind an EIP to the DB instance to make the instance publicly accessible.

If you are using RDS for the first time, see the constraints described in section [PostgreSQL Constraints](#).

Process

[Figure 2-15](#) illustrates the process of connecting to a PostgreSQL DB instance through a public network.

Figure 2-15 Connecting to a DB instance through a public network



- **Step 1: Buy a DB instance.** Confirm the specifications, storage, network, and database account configurations of the PostgreSQL DB instances based on service requirements.
- **Step 2: Bind an EIP.** The EIP provides independent public IP addresses and bandwidth for Internet access. You can apply for an EIP on the VPC console and bind the EIP to the RDS DB instance.
- **Step 3: Configure security group rules.** To access a DB instance from resources outside the security group, you need to configure an inbound rule for the security group associated with the DB instance.
- **Step 4: Connect to a DB instance through psql.** You can connect to a DB instance through a common connection or an SSL connection. The SSL connection encrypts data and is more secure.

2.4.2 Step 1: Buy a DB Instance

Scenarios

This section describes how to create a DB instance on the RDS console.


Currently, RDS for PostgreSQL supports the yearly/monthly and pay-per-use billing modes. RDS allows you to tailor your computing resources and storage space to your business needs.

Prerequisites

- You have registered a HUAWEI CLOUD account.
- After registering a HUAWEI CLOUD account, you can create an IAM user or user group on the IAM console and grant it specific operation permissions, to perform refined management on HUAWEI CLOUD. For details, see [Creating a User and Granting Permissions](#).
- Your account balance is greater than or equal to ¥0.

Procedure

Step 1 Log in to the management console.

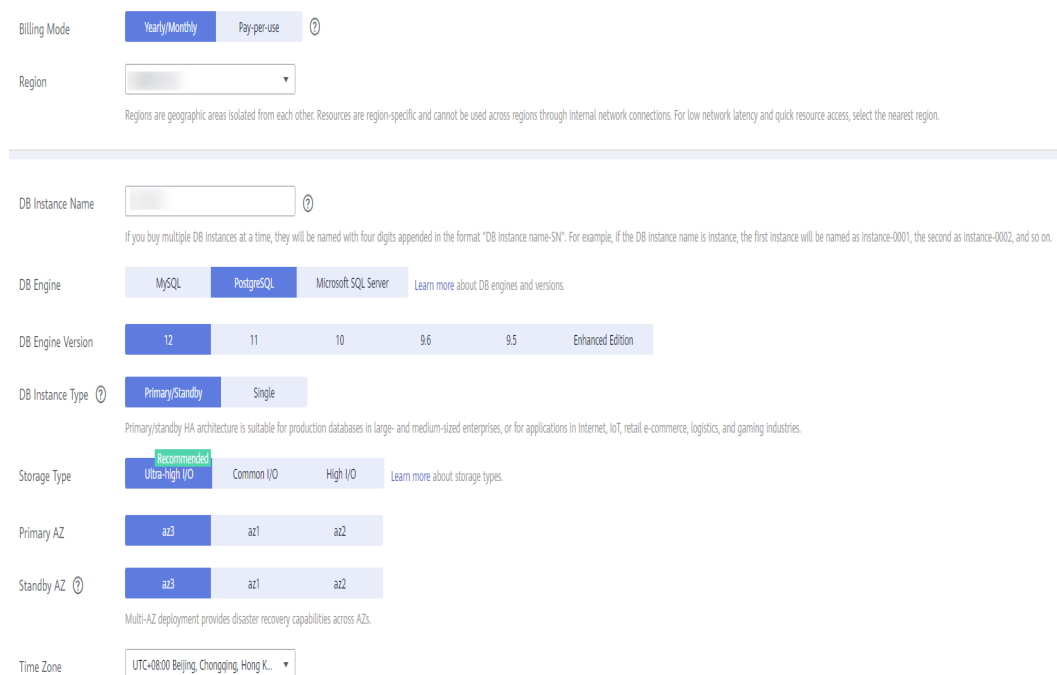
Step 2 Click  in the upper left corner and select a region and a project.

Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

Step 4 On the **Instance Management** page, click **Buy DB Instance**.

Step 5 On the displayed page, select a billing mode, configure information about your DB instance. Then, click **Next**.

Figure 2-16 Billing mode and basic information



Billing Mode: Yearly/Monthly Pay-per-use ⓘ

Region: ⓘ
Regions are geographic areas isolated from each other. Resources are region-specific and cannot be used across regions through internal network connections. For low network latency and quick resource access, select the nearest region.

DB Instance Name: ⓘ
If you buy multiple DB instances at a time, they will be named with four digits appended in the format "DB instance name-SN". For example, if the DB instance name is instance, the first instance will be named as instance-0001, the second as instance-0002, and so on.

DB Engine: MySQL PostgreSQL Microsoft SQL Server [Learn more about DB engines and versions.](#)

DB Engine Version: 12 11 10 9.6 9.5 Enhanced Edition

DB Instance Type ⓘ: Primary/Standby Single
Primary/standby HA architecture is suitable for production databases in large- and medium-sized enterprises, or for applications in Internet, IoT, retail e-commerce, logistics, and gaming industries.

Storage Type: Ultra-high I/O Common I/O High I/O [Learn more about storage types.](#)

Primary AZ: az3 az1 az2

Standby AZ ⓘ: az3 az1 az2
Multi-AZ deployment provides disaster recovery capabilities across AZs.

Time Zone: UTC+08:00 Beijing, Chongqing, Hong K...

RDS provides the following billing modes:

Yearly/Monthly

If you select this billing mode, skip **Step 6** and go to **Step 7**.

Pay-per-use

If you select this billing mode, go to [Step 6](#).

Table 2-19 Basic information

Parameter	Description
Region	<p>The region your RDS resources will be located. You can change it on the creation page, or go back to the Instance Management page and change it in the upper left corner.</p> <p>NOTE Products in different regions cannot communicate with each other through a private network and you cannot change the region of a DB instance after creating the instance. Therefore, exercise caution when selecting a region.</p>
DB Instance Name	<p>Must start with a letter and consist of 4 to 64 characters. Only letters, digits, hyphens (-), and underscores (_) are allowed.</p> <ul style="list-style-type: none"> • If you intend to create multiple DB instances and read replicas, the length of each DB name will change. • If you create multiple DB instances at a time, they will be named with four digits appended to the DB instance name. For example, if you enter instance, the first instance will be named as instance-0001, the second as instance-0002, and so on.
DB Engine	Set to PostgreSQL .
DB Engine Version	<p>For details, see DB Engines and Versions.</p> <p>Different DB engine versions are supported in different regions.</p> <p>If you use a PostgreSQL database, select a proper DB engine version based on service requirements. You are advised to select the latest available version because it is more stable, reliable, and secure. PostgreSQL 9.5 will be end of maintenance (EOM) on February 11, 2021. Select a later version.</p>

Parameter	Description
DB Instance Type	<ul style="list-style-type: none"> ● Primary/Standby: uses the HA architecture with a primary DB instance and a synchronous standby DB instance. It is suitable for production databases of large- and medium-sized enterprises in Internet, Internet of Things (IoT), retail e-commerce sales, logistics, gaming, and other sectors. The standby DB instance improves instance reliability and is invisible to you after being created. An AZ is a physical region where resources use independent power supply and networks. AZs are physically isolated but interconnected through an internal network. Some regions support both single AZs and multiple AZs and some only support single AZs. To achieve higher reliability, RDS will automatically deploy your primary and standby instances in different physical servers even if you deploy primary/standby DB instances in the same AZ. If you attempt to create primary/standby DB 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. <ul style="list-style-type: none"> - If they are the same (default setting), the primary and standby DB instances are deployed in the same AZ. - If they are different, the primary and standby DB instances are deployed in different AZs to ensure failover support and high availability. ● Single: uses the single-node architecture, which is more cost-effective than mainstream primary/standby DB instances. It is suitable for developing and testing of microsites, and small- and medium-sized enterprises, or for learning about RDS.
Storage Type	<p>Determines the DB instance read/write speed. The higher the maximum throughput is, the higher the DB instance read/write speed can be.</p> <ul style="list-style-type: none"> ● Ultra-high I/O: supports a maximum throughput of 350 MB/s. <p>NOTE If you select DSS for Resource Type, only the storage type that you have selected when buying the DSS service is displayed by default.</p>
Time Zone	<p>Select a time zone when you are creating a DB instance, and you can change it after the DB instance is created.</p>

Figure 2-17 DB instance specifications

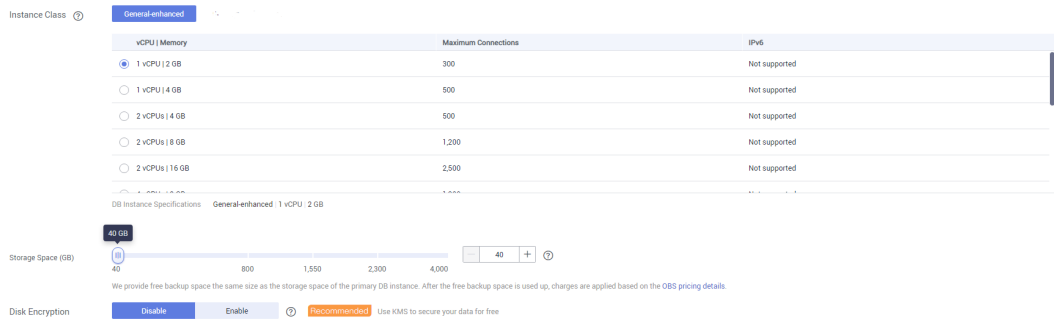


Table 2-20 Instance specifications

Parameter	Description
Instance Class	<p>Refers to the CPU and memory of a DB instance. Different instance classes have different numbers of database connections and different maximum IOPS.</p> <p>For details about instance classes, see DB Instance Classes.</p> <p>After a DB instance is created, you can change its CPU and memory. For details, see Changing a DB Instance Class.</p> <p>NOTE DB instances in a DCC only support the general-optimized instance class.</p>
Resource Type	<ul style="list-style-type: none"> • EVS • DSS <p>NOTE This option is displayed only when you buy the DSS service.</p>
Storage Pool	<p>Displayed only when you select DSS for Resource Type. The storage pool is secure because it is physically isolated from other pools.</p>
Storage Space (GB)	<p>Contains the file system overhead required for inode, reserved block, and database operation. Can range in size from 40 GB to 4,000 GB and can be scaled up only by a multiple of 10 GB.</p> <p>After a DB instance is created, you can scale up its storage space. For details, see Scaling Up Storage Space.</p>

Parameter	Description
Disk Encryption	<ul style="list-style-type: none"> • Disabled: indicates the encryption function is disabled. • Enabled: indicates the encryption function is enabled, improving data security but affecting system performance. <p>Key Name: indicates the tenant key. You can create or select a key.</p> <p>NOTE</p> <ul style="list-style-type: none"> - Once the DB instance is created, you cannot modify the disk encryption status or change the key. The backup data stored in OBS is not encrypted. - After an RDS DB instance is created, do not disable or delete the key that is being used. Otherwise, RDS will be unavailable and data cannot be restored. - For details about how to create a key, see the "Creating a CMK" section in the <i>Data Encryption Workshop User Guide</i>.

Table 2-21 Database Security Service

Parameter	Description
DBSS	<p>Prevents database attacks, ensuring database security on the cloud.</p> <ul style="list-style-type: none"> • After you subscribe to Database Security Service (DBSS), you cannot buy DB instances in patches. • Only DB instances of certain specifications support the purchase of RDS and DBSS together. • The DBSS administrator is admin, and the password is the same as that of the RDS root user. • After you subscribe to DBSS, log in to the DBSS console, associate an EIP with the DBSS instance and configure security protection.

Figure 2-18 Network and database configuration

The screenshot shows the configuration page for an RDS instance. At the top, there's a section for 'Relationship among VPCs, subnets, security groups, and DB instances'. It includes dropdowns for VPC (vpc-02), Subnet (subnet-02), and Security Group (sg-02). Below this is a 'Password' section with 'Configure' and 'Skip' buttons, and fields for Administrator (root), Administrator Password, and Confirm Password. There's also a 'Parameter Template' dropdown set to 'Default-PostgreSQL-12' and an 'Enterprise Project' dropdown set to 'default'. A 'Tag' section has input fields for 'Tag key' and 'Tag value'. At the bottom, there's a 'Required Duration' section with radio buttons for 1, 2, 3, 4, 5, 6, 7, 8, 9 months, 1 year (selected), 2 years, and 3 years, and an 'Auto-renew' checkbox. A 'Quantity' section shows a value of 1 with a plus sign and a note: 'The total number of primary DB instances and read replicas cannot exceed 50. Increase quota'.

Table 2-22 Network

Parameter	Description
VPC	<p>A dedicated virtual network in which your RDS DB instances are located. A VPC can isolate networks for different services. You can select an existing VPC or create a VPC. For details on how to create a VPC, see the "Creating a VPC" section in the <i>Virtual Private Cloud User Guide</i>.</p> <p>If no VPC is available, RDS allocates a VPC for you by default.</p> <p>NOTICE After the DB instance is created, the VPC cannot be changed.</p>
Subnet	<p>Improves network security by providing dedicated network resources that are logically isolated from other networks. Subnets take effect only within an AZ. The Dynamic Host Configuration Protocol (DHCP) function is enabled by default for subnets in which you plan to create RDS DB instances and cannot be disabled.</p> <p>A floating IP address is automatically assigned when you create a DB instance. You can also enter an unused floating IP address in the subnet CIDR block. After the DB instance is created, you can change the floating IP address.</p>
Security Group	<p>Controls the access that traffic has in and out of a DB instance. By default, the security group associated with the DB instance is authorized.</p> <p>Enhances security by controlling access to RDS from other services. You need to add rules to a security group so that you can connect to your DB instance.</p> <p>If no security group is available, RDS allocates a security group to you by default.</p>

Table 2-23 Database configuration

Parameter	Description
Password	<ul style="list-style-type: none"> • Configure (default value): Configure the password when you are creating the DB instance. • Skip: The system does not set an initial password for you. <p>NOTICE To log in, you will have to reset a password for the DB instance.</p> <p>After a DB instance is created, you can reset the password. For details, see Resetting the Administrator Password.</p>
Administrator	The default login name for the database is root .
Administrator Password	<p>Must consist of 8 to 32 characters and contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters (~!@#%&^*-_+=?,). Enter a strong password. Periodically change it to improve security and prevent security risks such as brute force cracking.</p> <p>Keep this password secure. The system cannot retrieve it.</p> <p>After a DB instance is created, you can reset this password. For details, see Resetting the Administrator Password.</p>
Confirm Password	Must be the same as Administrator Password .
Parameter Template	<p>Contains engine configuration values that can be applied to one or more DB instances. If you intend to create primary/standby DB instances, they use the same parameter template. You can modify instance parameters as required after the DB instance is created.</p> <p>NOTICE If you use a custom parameter template when creating a DB instance, the following specification-related parameters in the custom template are not delivered. Instead, the default values are used.</p> <ul style="list-style-type: none"> • maintenance_work_mem • shared_buffers • max_connections • effective_cache_size <p>You can modify the instance parameters as required after the DB instance is created. For details, see section Modifying Parameters in a Parameter Template.</p>

Parameter	Description
Enterprise Project	<p>If the DB instance has been associated with an enterprise project, select the target project from the Enterprise Project drop-down list.</p> <p>You can also go to the ProjectMan console to create a project. For details about how to create a project, see the <i>ProjectMan User Guide</i>.</p>

Table 2-24 Tags

Parameter	Description
Tag	<p>Tags an RDS DB instance. This configuration is optional. Adding tags to RDS DB instances helps you better identify and manage the DB instances. A maximum of 10 tags can be added for each DB instance.</p> <p>After a DB instance is created, you can view its tag details on the Tags page. For detailed operations, see Managing Tags.</p>

Table 2-25 Purchase period

Parameter	Description
Required Duration	<p>This option is available only for yearly/monthly DB instances. The system will automatically calculate the configuration fee based on the selected required duration. The longer the required duration is, the larger discount you will enjoy.</p>
Auto-renew	<ul style="list-style-type: none"> This option is available only for yearly/monthly DB instances and is not selected by default. If you select this option, the auto-renew cycle is determined by the selected required duration.
Quantity	<p>RDS supports batch creation of DB instances. If you intend to create primary/standby DB instances and set Quantity to 1, a primary DB instance and a synchronous standby DB instance will be created.</p>

If you have any questions about the price, click **Pricing details** at the bottom of the page.

 **NOTE**

The performance of your DB instance depends on its configurations. Hardware configuration items include the instance specifications, storage type, and storage space.

Step 6 Confirm the specifications for pay-per-use DB instances.

Figure 2-19 Specifications confirmation

Resource	Configuration	Billing Mode	Quantity	Price	
DB Instance	Billing Mode	Pay-per-use			
	Region				
	DB Instance Name				
	DB Engine	PostgreSQL			
	DB Engine Version	12			
	DB Instance Type	Primary/Standby			
	Primary AZ	az3			
	Standby AZ	az3			
	Instance Specifications	General-enhanced 1 vCPU 2 GB, Maximum Connections : 300			
	Storage Type	Ultra-high I/O	Pay-per-use	1	¥1.00/hour
	Storage Space	40 GB			
	Time Zone	UTC+08:00			
	Disk Encryption	Disabled			
	VPC	default_vpc			
	Subnet	subnet-8efb192.168.2.0/24			
Floating IP Address	Automatically assigned				
Security Group	default_securitygroup (Inbound: TCP(21, 20-21, 20, 18, 22, 22, 22, --, --, 20-21, 22, --, 22; ICMP(8, --, 8-0, --, --, UDP(8, --, 30) Outbound: --)				
Parameter Template	Default-PostgreSQL-12				

- If you need to modify your settings, click **Previous**.
- If you do not need to modify your settings, click **Submit**.

Skip **Step 7** and **Step 8** and go to **Step 9**.

Step 7 Confirm the order for yearly/monthly DB instances.

Figure 2-20 Order confirmation

Resource	Configuration	Billing Mode	Required Duration	Quantity	Price	
DB Instance	Billing Mode	Yearly/Monthly				
	Region					
	DB Instance Name					
	DB Engine	PostgreSQL				
	DB Engine Version	12				
	DB Instance Type	Primary/Standby				
	Primary AZ	az3				
	Standby AZ	az3				
	Instance Specifications	General-enhanced 1 vCPU 2 GB, Maximum Connections : 300				
	Storage Type	Ultra-High I/O	Yearly/Monthly	1 year	1	¥1.00/hour
	Storage Space	40 GB				
	Time Zone	UTC+08:00				
	Disk Encryption	Disabled				
	VPC	default_vpc				
	Subnet	subnet-8efb192.168.2.0/24				
Floating IP Address	Automatically assigned					
Security Group	default_securitygroup (Inbound: TCP(21, 20-21, 20, 18, 22, 22, 22, --, --, 20-21, 22, --, 22; ICMP(8, --, 8-0, --, --, UDP(8, --, 30) Outbound: nd, --)					
Parameter Template	Default-PostgreSQL-12					


- If you need to modify your settings, click **Previous**.
- If you do not need to modify your settings, click **Pay Now**.

Step 8 Select a payment method and complete the payment.

NOTE

This operation applies only to the yearly/monthly billing mode.

Step 9 To view and manage the DB instance, go to the **Instance Management** page.

- During the creation process, the DB instance status is **Creating**.
- To refresh the DB instance list, click  in the upper right corner of the list. When the creation process is complete, the instance status will change to **Available**.
- The automated backup policy is enabled by default. After the DB instance is created, you can modify the policy as needed. An automated full backup is immediately triggered after a DB instance is created.
- After a DB instance is created, you can enter a description for it.

- The default database port is **5432**. After a DB instance is created, you can change the database port.

 **NOTE**

You are advised to change the database port in a timely manner.
For details, see [Changing the Database Port](#).

----End

Related Operations

[Creating a DB Instance Using an API](#)

2.4.3 Step 2: Bind an EIP

Scenarios

You can bind an EIP to the DB instance for public accessibility and can unbind the EIP from the DB instance as required.

Precautions

- You need to configure security groups and enable specific IP addresses and ports to access the target DB instance. Before accessing the DB instance, you need to add an individual IP address or an IP address range that will access the DB instance to the inbound rule. For details, see section [Step 3: Configure Security Group Rules](#).
- You can buy an EIP on the VPC console and bind it to a DB instance. For pricing details, see [Elastic IP pricing details](#).

Binding an EIP

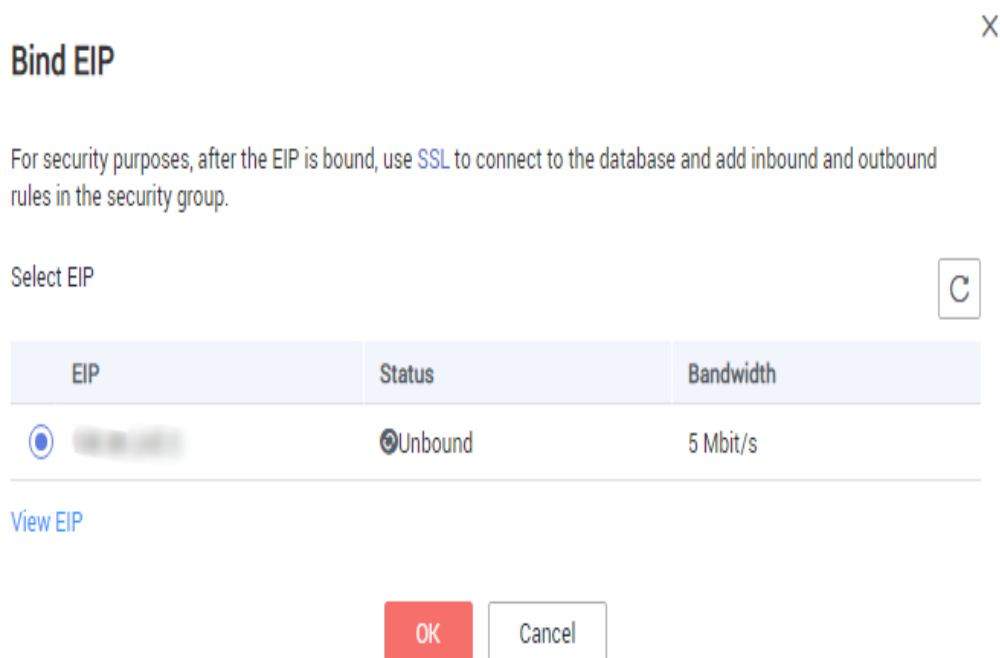
Step 1 On the **Instance Management** page, click the target DB instance.

Step 2 In the navigation pane on the left, choose **EIPs**. On the displayed page, click **Bind EIP**.

Step 3 In the displayed dialog box, select an EIP and click **OK**.

If no available EIPs are displayed, click **View EIP** to obtain an EIP.

Figure 2-21 Selecting an EIP



Step 4 On the **EIPs** page, view the EIP that has been bound to the DB instance.

You can also view the progress and result of binding an EIP to a DB instance on the **Task Center** page.

----End

2.4.4 Step 3: Configure Security Group Rules

Scenarios

A security group is a collection of access control rules for ECSs and RDS DB instances that have the same security protection requirements and are mutually trusted in a VPC.

This section describes how to create a security group to enable specific IP addresses and ports to access RDS.

When you attempt to connect to an RDS DB instance through an EIP, you need to configure an **inbound rule** for the security group associated with the DB instance.

Precautions

The default security group rule allows all outgoing data packets. ECSs and RDS DB instances can access each other if they are deployed in the same security group. After a security group is created, you can configure security group rules to control access from and to the DB instances in the security group.

- By default, you can create a maximum of 500 security group rules.
- One security group can be associated with only one RDS DB instance.

- Too many security group rules will increase the first packet latency. You are advised to create a maximum of 50 rules for each security group.
- To access an RDS DB instance from resources outside the security group, you need to configure an **inbound rule** for the security group associated with the RDS DB instance.

 **NOTE**


To ensure security of data and DB instances, you are advised to use the principle of least privilege for database access. Change the database port (default value: **3306**), and set the IP address to the remote server's address or any IP address in the remote server's smallest subnet to control the access scope of the remote server.

If you use **0.0.0.0/0**, you enable all IP addresses to access RDS DB instances in the security group.

For details about the requirements of security group rules, see the [Adding a Security Group Rule](#) section in the *Virtual Private Cloud User Guide*.

Procedure

Step 1 Log in to the management console.

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

Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

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

Step 5 Configure security group rules.

In the **Connection Information** area, click the security group.

Figure 2-22 Connection information



Step 6 On the inbound rule tab, click **Add Rule**. In the displayed dialog box, set required parameters to add an inbound rule.

You can click **+** to add more inbound rules.

Figure 2-23 Adding an inbound rule

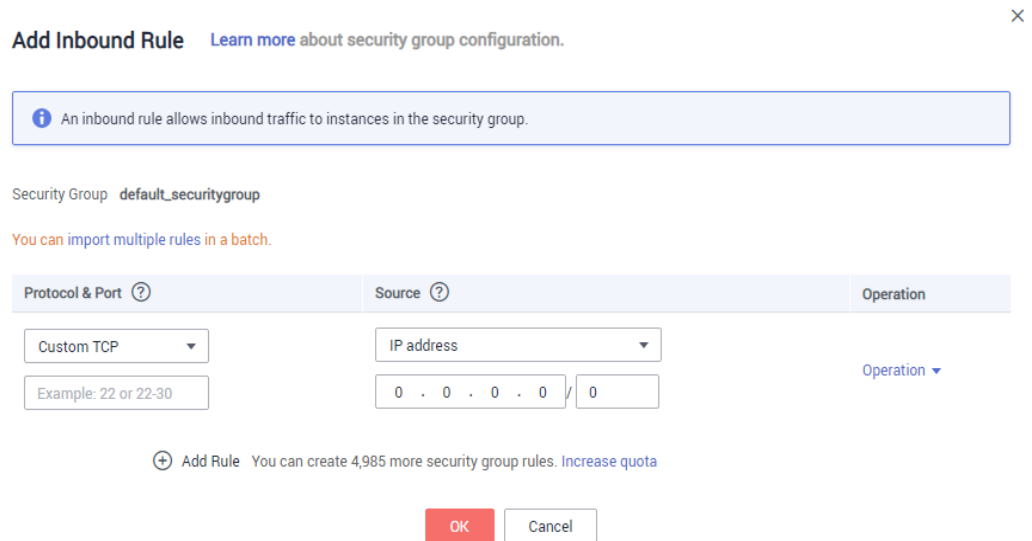


Table 2-26 Inbound rule parameter description

Parameter	Description	Example Value
Protocol & Port	Specifies the network protocol. Currently, the value can be All , TCP , UDP , ICMP , GRE , or others.	Custom TCP
	Port : specifies the port or port range over which the traffic can reach your ECS. Common ports are listed in Common Ports Used by ECSs .	When connecting to the DB instance through a public network, enter the port of the target DB instance.
Source	Specifies the source of the security group rule. The value can be another security group or a single IP address. For example: <ul style="list-style-type: none"> • xxx.xxx.xxx.xxx/32 (IPv4 address) • xxx.xxx.xxx.0/24 (subnet) • 0.0.0.0/0 (any IP address) 	0.0.0.0/0
Description	Provides supplementary information about the security group rule. This parameter is optional. The description can contain a maximum of 255 characters and cannot contain angle brackets (<) or (>).	-

----End

2.4.5 Step 4: Connect to a DB Instance Through psql

You can use the PostgreSQL client `psql` to connect to a DB instance through a common connection or an SSL connection. The SSL connection is encrypted and therefore more secure.

Preparations

1. To connect to a DB instance through an EIP, you must:
 - a. Bind the EIP to the DB instance. For details, see [Step 2: Bind an EIP](#).
 - b. Ensure that the local device can access the EIP.
2. Install the PostgreSQL client on the prepared ECS or device.
For details, see [How Can I Install the PostgreSQL Client?](#)

Common Connection

Step 1 Log in to the ECS or the device that can access RDS.

Step 2 Run the following command to connect to the DB instance:

```
psql --no-readline -U <user> -h <host> -p <port> -d <datastore> -W
```

Table 2-27 Parameter description

Parameter	Description
<code><user></code>	Indicates the username of the RDS database account. The default administrator is root .
<code><host></code>	Indicates the IP address of the primary DB instance. To obtain this parameter, go to the Basic Information page of the DB instance. The IP address can be found on the EIPs page.
<code><port></code>	Indicates the database port in use. The default value is 5432 . To obtain this parameter, go to the Basic Information page of the DB instance. The port number can be found in the Database Port field in the Connection Information area.
<code><datastore></code>	Indicates the name of the database (the default database name is postgres).

The parameter **-W** indicates that a password must be entered for the connection. After running this command, you will be prompted to enter a password.



Example:

Run the following command as user **root** to connect to a DB instance:

```
psql --no-readline -U root -h 192.168.0.44 -p 5432 -d postgres -W
```

----End

SSL Connection

- Step 1** Log in to the management console.
- Step 2** Click  in the upper left corner and select a region and a project.
- Step 3** Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.
- Step 4** In the **DB Information** area on the **Basic Information** page, click  in the **SSL** field to download the root certificate or certificate bundle.
- Step 5** Upload the root certificate to the ECS or save it to the device to be connected to the DB instance.

Import the root certificate to the Linux OS on the ECS. For details, see [How Can I Import the Root Certificate to the Windows or Linux OS?](#)

- Step 6** Connect to an RDS DB instance. The Linux OS is used as an example.

```
psql --no-readline -h <host> -p <port> "dbname=<database> user=<user>
sslmode=verify-ca sslrootcert=<ca-file-directory>"
```

Table 2-28 Parameter description

Parameter	Description
<i><host></i>	Indicates the IP address of the primary DB instance. To obtain this parameter, go to the Basic Information page of the DB instance. The IP address can be found on the EIPs page.
<i><port></i>	Indicates the database port in use. The default value is 5432 . To obtain this parameter, go to the Basic Information page of the DB instance. The port number can be found in the Database Port field in the Connection Information area.
<i><database></i>	Indicates the name of the database (the default database name is postgres).
<i><user></i>	Indicates the username of the RDS database account. The default administrator is root .
<i><ca-file-directory></i>	Indicates the directory of the CA certificate for the SSL connection. The certificate should be stored in the directory where the command is executed.
sslmode	Indicates the SSL connection mode. Set it to verify-ca to use a CA to check whether the service is trusted.

Enter the password of the database account if the following information is displayed:

Password:

For example, to connect to a DB instance through an SSL connection as user **root**, run the following command:

```
psql --no-readline -h 192.168.0.44 -p 5432 "dbname=postgres user=root  
sslmode=verify-ca sslrootcert=/root/ca.pem"
```

Password:

Step 7 The SSL connection is established if information similar to the following is displayed after you log in to the database:

```
SSL connection (protocol: TLSv1.2, cipher: ECDHE-RSA-AES256-GCM-SHA384, bits: 256, compression: off)
```

```
----End
```

FAQs

[What Should I Do If I Fail to Connect to an RDS DB Instance?](#)

Follow-up Operations

After logging in to the DB instance, you can create or migrate databases.

- [Creating a PostgreSQL Database Using an API](#)
- [Managing PostgreSQL Databases Using DAS](#)
- [Migrating PostgreSQL Databases Using DRS](#)
- [Migrating PostgreSQL Databases Using psql](#)

3 Getting Started with RDS for SQL Server

3.1 Connecting to a DB Instance

An RDS DB instance can be connected through a private network, the Data Admin Service (DAS) service, or a public network.

Table 3-1 RDS connection methods

Connect Through	IP Address	Scenarios	Description
DAS	No IP address is required. You can log in to the DAS console and use RDS directly.	Data Admin Service (DAS) enables you to manage databases on a web-based console and supports SQL execution, advanced database management, and intelligent O&M, simplifying database management and improving working efficiency and data security. The permissions required for connecting to DB instances through DAS are enabled by default.	<ul style="list-style-type: none"> • Easy to use, secure, advanced, and intelligent • Recommended
Private network	Floating IP	<p>RDS provides a floating IP address by default.</p> <p>When your applications are deployed on an ECS that is in the same region and VPC as RDS, you are advised to use a floating IP address to connect to the RDS DB instance through the ECS.</p>	<ul style="list-style-type: none"> • Secure and excellent performance • Recommended

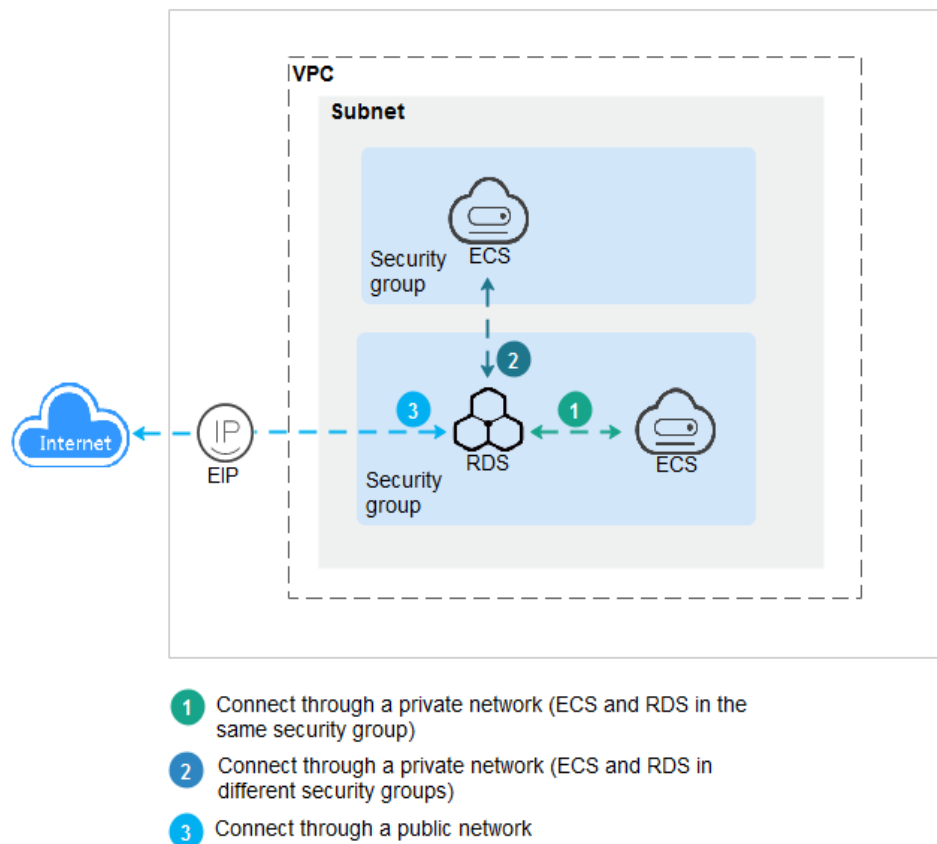
Connect Through	IP Address	Scenarios	Description
Public network	EIP	If you cannot access an RDS DB instance through a floating IP address, bind an EIP to the DB instance and connect the DB instance to the ECS through the EIP.	<ul style="list-style-type: none"> • A relatively lower level of security compared to other connection methods • To achieve a higher transmission rate and security level, you are advised to migrate your applications to an ECS that is in the same VPC as your RDS DB instance and use a floating IP address to access the DB instance. • You need to purchase an EIP. For pricing details, see EIP billing details.

 NOTE

- VPC: indicates the Virtual Private Cloud.
- ECS: indicates the Elastic Cloud Server.
- You can log in to DB instances using the Data Admin Service (DAS) service or other database clients.
- If the ECS is in the same VPC as the RDS DB instance, you do not need to apply for an EIP.

Figure 3-1 illustrates the connection over a private network or a public network.

Figure 3-1 DB instance connection



Connecting to DB Instances Running Other DB Engines

- [Connecting to a MySQL DB Instance](#)
- [Connecting to a PostgreSQL DB Instance](#)

3.2 Connecting to a DB Instance Through DAS

3.2.1 Overview

Scenarios

With DAS, you can perform SQL executions, advanced database management, and intelligent O&M on a web-based console, which simplifies database management and improves working efficiency and data security. The permission of connecting DB instances through DAS is enabled by default.

This section describes how to buy a SQL Server DB instance on the management console and connect to the DB instance through DAS. If you are using RDS for the first time, see the constraints described in section [Microsoft SQL Server Constraints](#).

Process

To connect to a DB instance through DAS:

- **Step 1: Buy a DB instance.** Confirm the specifications, storage, network, and database account configurations of the SQL Server DB instances based on service requirements.
- **Step 2: Connect to a DB instance through DAS.** Use DAS to connect to and manage the DB instance.

3.2.2 Step 1: Buy a DB Instance

Scenarios

This section describes how to create a DB instance on the RDS console.

Currently, RDS for SQL Server supports the yearly/monthly and pay-per-use billing modes. The DB instance class and storage space you need depend on your processing power and memory requirements.

Prerequisites

- You have registered a HUAWEI CLOUD account.
- After registering a HUAWEI CLOUD account, you can create an IAM user or user group on the IAM console and grant it specific operation permissions, to perform refined management on HUAWEI CLOUD. For details, see [Creating a User and Granting Permissions](#).
- Your account balance is greater than or equal to ¥0.

Procedure

Step 1 Log in to the management console.

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

Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

Step 4 On the **Instance Management** page, click **Buy DB Instance**.

Step 5 On the displayed page, select a billing mode, configure information about your DB instance. Then, click **Next**.

Figure 3-2 Billing mode and basic information

The screenshot shows the configuration page for a new RDS instance. Key settings include:

- Billing Mode:** Yearly/Monthly (selected), Pay-per-use.
- Region:** A dropdown menu.
- DB Instance Name:** A text input field.
- DB Engine:** Microsoft SQL Server (selected), with links for MySQL and PostgreSQL.
- DB Engine Version:** 2017 Enterprise Edition (selected), with other versions like Standard Edition and Web Edition available.
- DB Instance Type:** Cluster (selected), Single.
- Storage Type:** Ultra-high I/O (recommended), Common I/O, High I/O, Ultra-High I/O(advanced).
- Primary AZ:** az3 (selected), az1, az2.
- Standby AZ:** az3 (selected), az1, az2.
- Time Zone:** UTC+08:00 Beijing, Chongqing, Hong K... (selected).
- Server Collation:** Chinese_PRC_CI_AS (selected).

RDS provides the following billing modes:

Yearly/Monthly

If you select this billing mode, skip **Step 6** and go to **Step 7**.

Pay-per-use

If you select this billing mode, go to **Step 6**.

Table 3-2 Basic information

Parameter	Description
Region	The region your RDS resources will be located. You can change it on the creation page, or go back to the Instance Management page and change it in the upper left corner. NOTE Products in different regions cannot communicate with each other through a private network and you cannot change the region of a DB instance after creating the instance. Therefore, exercise caution when selecting a region.
DB Instance Name	Must start with a letter and consist of 4 to 64 characters. Only letters, digits, hyphens (-), and underscores (_) are allowed. <ul style="list-style-type: none"> If you intend to create multiple DB instances and read replicas, the length of each DB name will change. If you create multiple DB instances at a time, they will be named with four digits appended to the DB instance name. For example, if you enter instance, the first instance will be named as instance-0001, the second as instance-0002, and so on.
DB Engine	Set to Microsoft SQL Server .

Parameter	Description
DB Engine Version	<p>For details, see DB Engines and Versions.</p> <p>Different DB engine versions are supported in different regions.</p> <p>If you use a Microsoft SQL Server database, select a proper DB engine version based on service requirements. You are advised to select the latest available version because it is more stable, reliable, and secure.</p>
DB Instance Type	<ul style="list-style-type: none"> <p>• Primary/Standby: uses the HA architecture with a primary DB instance and a synchronous standby DB instance. It is suitable for production databases of large- and medium-sized enterprises in Internet, Internet of Things (IoT), retail e-commerce sales, logistics, gaming, and other sectors. The standby DB instance improves instance reliability and is invisible to you after being created.</p> <p>An AZ is a physical region where resources use independent power supply and networks. AZs are physically isolated but interconnected through an internal network. Some regions support both single AZs and multiple AZs and some only support single AZs.</p> <p>To achieve higher reliability, RDS will automatically deploy your primary and standby instances in different physical servers even if you deploy primary/standby DB instances in the same AZ. If you attempt to create primary/standby DB instances in the same AZ in a Dedicated Computing Cluster (DCC) and there is only one physical server available, the creation will fail.</p> <p>RDS supports deploying primary and standby DB instances in an AZ or across AZs. You can determine whether the standby AZ is the same as the primary AZ.</p> <ul style="list-style-type: none"> - If they are the same (default setting), the primary and standby DB instances are deployed in the same AZ. - If they are different, the primary and standby DB instances are deployed in different AZs to ensure failover support and high availability. <p>• Single: uses the single-node architecture, which is more cost-effective than mainstream primary/standby DB instances. It is suitable for developing and testing of microsites, and small- and medium-sized enterprises, or for learning about RDS.</p>

Parameter	Description
Storage Type	<p>Determines the DB instance read/write speed. The higher the maximum throughput is, the higher the DB instance read/write speed can be.</p> <ul style="list-style-type: none"> • Ultra-high I/O: supports a maximum throughput of 350 MB/s. <p>NOTE If you select DSS for Resource Type, only the storage type that you have selected when buying the DSS service is displayed by default.</p>
Time Zone	<p>Select your time zone when you are creating a DB instance. After the DB instance is created, the time zone cannot be modified. For details, see Table 3-3.</p>
Server Collation	<p>Defines a collation of a database or table column, or a collation cast operation when applied to character string expression. It acts as the default collation for the DB instance.</p>

Table 3-3 Mapping between time zones and UTC offsets

Time Zone	Standard Time Offset	Remarks
Afghanistan Standard Time	UTC+04:30	Kabul
Alaskan Standard Time	UTC-09:00	Alaska
Arabian Standard Time	UTC+04:00	Abu Dhabi, Muscat
Atlantic Standard Time	UTC-04:00	Atlantic Time (Canada)
AUS Central Standard Time	UTC+09:30	Darwin
AUS Eastern Standard Time	UTC+10:00	Canberra, Melbourne, Sydney
Belarus Standard Time	UTC+03:00	Minsk
Canada Central Standard Time	UTC-06:00	Saskatchewan
Cape Verde Standard Time	UTC-01:00	Cape Verde Is.
Gen. Australia Standard Time	UTC+09:30	Adelaide
Central America Standard Time	UTC-06:00	Central America

Time Zone	Standard Time Offset	Remarks
Central Asia Standard Time	UTC+06:00	Astana
Central Brazilian Standard Time	UTC-04:00	Cuiaba
Central European Standard Time	UTC+01:00	Belgrade, Bratislava, Budapest, Ljubljana, Prague
Central European Standard Time	UTC+01:00	Sarajevo, Skopje, Warsaw, Zagreb
Central Pacific Standard Time	UTC+11:00	Solomon Islands, New Caledonia
Central Standard Time	UTC-06:00	Central Time (US and Canada)
China Standard Time	UTC+08:00	Beijing, Chongqing, Hong Kong, and Urumqi
E. Africa Standard Time	UTC+03:00	Nairobi
E. Australia Standard Time	UTC+10:00	Brisbane
E. Europe Standard Time	UTC+02:00	Chisinau
E. South America Standard Time	UTC-03:00	Brasilia
Eastern Standard Time	UTC-05:00	Eastern Time (US and Canada)
Georgian Standard Time	UTC+04:00	Tbilisi
GMT Standard Time	UTC	Dublin, Edinburgh, Lisbon, London
Greenland Standard Time	UTC-03:00	Greenland
Greenwich Standard Time	UTC	Monrovia, Reykjavik
GTB Standard Time	UTC+02:00	Athens, Bucharest
Hawaiian Standard Time	UTC-10:00	Hawaii
India Standard Time	UTC+05:30	Chennai, Kolkata, Mumbai, New Delhi
Jordan Standard Time	UTC+02:00	Amman
Korea Standard Time	UTC+09:00	Seoul

Time Zone	Standard Time Offset	Remarks
Middle East Standard Time	UTC+02:00	Beirut
Mountain Standard Time	UTC-07:00	Mountain Time (US and Canada)
US Mountain Standard Time	UTC-07:00	Arizona
New Zealand Standard Time	UTC+12:00	Auckland, Wellington
Newfoundland Standard Time	UTC-03:30	Newfoundland
Pacific SA Standard Time	UTC-03:00	Santiago
Pacific Standard Time	UTC-08:00	Pacific Time (US and Canada)
Russian Standard Time	UTC+03:00	Moscow/St. Petersburg
SA Pacific Standard Time	UTC-05:00	Bogota, Lima, Quito, Rio Branco
SE Asia Standard Time	UTC+07:00	Bangkok, Hanoi, Jakarta
China Standard Time	UTC+08:00	Kuala Lumpur, Singapore
Tokyo Standard Time	UTC+09:00	Osaka, Sapporo, Tokyo
US Eastern Standard Time	UTC-05:00	Indiana (East)
UTC	UTC	Coordinated Universal Time
UTC-02	UTC-02:00	Coordinated Universal Time-02
UTC-08	UTC-08:00	Coordinated Universal Time-08
UTC-09	UTC-09:00	Coordinated Universal Time-09
UTC-11	UTC-11:00	Coordinated Universal Time-11
UTC+12	UTC+12:00	Coordinated Universal Time+12
W. Australia Standard Time	UTC+08:00	Perth
W. Central Africa Standard Time	UTC+01:00	West Central Africa

Time Zone	Standard Time Offset	Remarks
W. Europe Standard Time	UTC+01:00	Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna

Figure 3-3 DB instance specifications

The screenshot displays the configuration options for a DB instance in the 'General-Enhanced' class. The 'Instance Class' is set to 'General-Enhanced'. Under 'vCPU | Memory', five options are listed:

vCPU Memory	IPv6
<input checked="" type="radio"/> 2 vCPUs 8 GB (exclusive)	Supported
<input type="radio"/> 2 vCPUs 16 GB (exclusive)	Not supported
<input type="radio"/> 4 vCPUs 8 GB (exclusive)	Supported
<input type="radio"/> 4 vCPUs 16 GB (exclusive)	Supported
<input type="radio"/> 4 vCPUs 32 GB (exclusive)	Not supported

Below this, the 'Storage Space (GB)' is set to 40 GB on a slider ranging from 40 to 4000 GB. The 'Disk Encryption' option is set to 'Enable', which is the recommended setting.

Table 3-4 Instance specifications

Parameter	Description
Instance Class	<p>Refers to the CPU and memory of a DB instance. Different instance classes have different numbers of database connections and different maximum IOPS.</p> <p>For details about instance classes, see DB Instance Classes.</p> <p>RDS DB instances have the following specifications:</p> <ul style="list-style-type: none"> • General: The allocated memory and I/O resources are exclusive. The vCPUs and storage space are shared by general DB instances on the same physical server. Storage size is not bound to vCPUs and memory and can be flexibly configured. In this way, the utilization rate is maximized and cost effectiveness is improved. The shared specifications are suitable for users who have a small budget and have low requirements on performance stability. • Exclusive: The vCPUs, memory, storage space, and I/O resources are exclusive. The performance is stable and is not affected by other DB instances on the same physical server. The premium configuration is that a DB instance exclusively occupies all resources of a physical server. The exclusive specifications are suitable for database-centered scenarios such as finance, e-commerce, government, and large- and medium-scale Internet business. <p>After a DB instance is created, you can change its CPU and memory. For details, see Changing a DB Instance Class.</p> <p>NOTE DB instances in a DCC only support the general-enhanced instance class.</p>
Resource Type	<ul style="list-style-type: none"> • EVS • DSS <p>NOTE This option is displayed only when you buy the DSS service.</p>
Storage Pool	<p>Displayed only when you select DSS for Resource Type. The storage pool is secure because it is physically isolated from other pools.</p>
Storage Space (GB)	<p>Contains the file system overhead required for inode, reserved block, and database operation. Can range in size from 40 GB to 4,000 GB and can be scaled up only by a multiple of 10 GB.</p> <p>After a DB instance is created, you can scale up its storage space. For details, see Scaling Up Storage Space.</p>

Parameter	Description
Disk Encryption	<ul style="list-style-type: none"> • Disabled: indicates the encryption function is disabled. • Enabled: indicates the encryption function is enabled, improving data security but affecting system performance. <p>Key Name: indicates the tenant key. You can create or select a key.</p> <p>NOTE</p> <ul style="list-style-type: none"> - Once the DB instance is created, you cannot modify the disk encryption status or change the key. The backup data stored in OBS is not encrypted. - After an RDS DB instance is created, do not disable or delete the key that is being used. Otherwise, RDS will be unavailable and data cannot be restored. - For details about how to create a key, see the "Creating a CMK" section in the <i>Data Encryption Workshop User Guide</i>.

Table 3-5 Database Security Service

Parameter	Description
DBSS	<p>Prevents database attacks, ensuring database security on the cloud.</p> <ul style="list-style-type: none"> • After you subscribe to Database Security Service (DBSS), you cannot buy DB instances in patches. • Only DB instances of certain specifications support the purchase of RDS and DBSS together. • The DBSS administrator is admin, and the password is the same as that of the RDS root user. • After you subscribe to DBSS, log in to the DBSS console, associate an EIP with the DBSS instance and configure security protection.

Figure 3-4 Network and database configuration

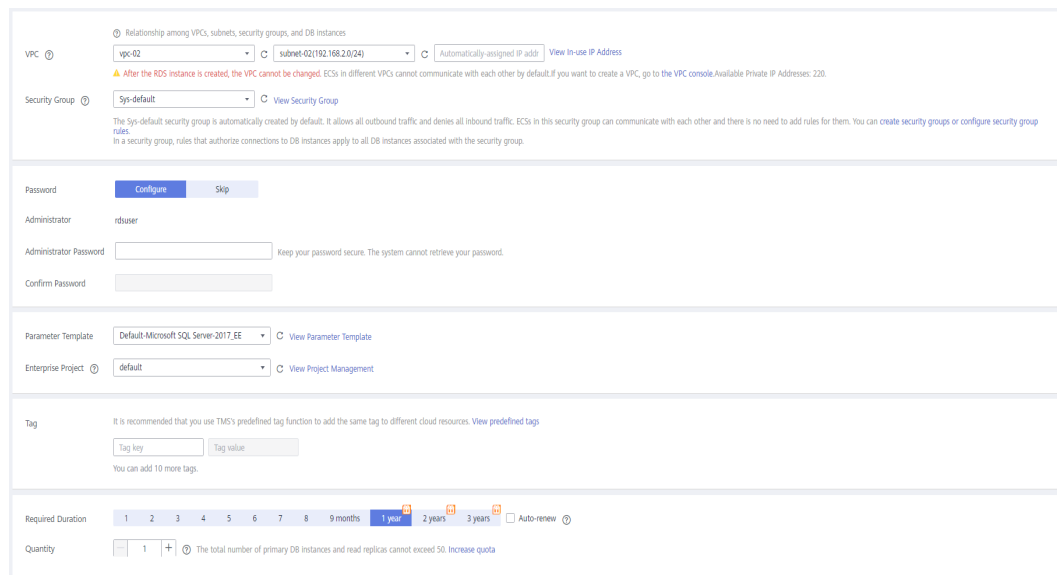


Table 3-6 Network

Parameter	Description
VPC	<p>A dedicated virtual network in which your RDS DB instances are located. A VPC can isolate networks for different services. You can select an existing VPC or create a VPC. For details on how to create a VPC, see the "Creating a VPC" section in the <i>Virtual Private Cloud User Guide</i>.</p> <p>If no VPC is available, RDS allocates a VPC to you by default.</p> <p>NOTICE After the DB instance is created, the VPC cannot be changed.</p>
Subnet	<p>Improves network security by providing dedicated network resources that are logically isolated from other networks. Subnets take effect only within an AZ. The Dynamic Host Configuration Protocol (DHCP) function is enabled by default for subnets in which you plan to create RDS DB instances and cannot be disabled.</p> <p>A floating IP address is automatically assigned when you create a DB instance. You can also enter an unused floating IP address in the subnet CIDR block. After the DB instance is created, you can change the floating IP address.</p>
Security Group	<p>Enhances security by controlling access to RDS from other services. You need to add rules to a security group so that you can connect to your DB instance.</p> <p>If no security group is available, RDS allocates a security group to you by default.</p> <p>NOTE To configure the Active Directory (AD) domain for the DB instance, ensure that the DB instance and domain controller must be in the same security group.</p>

Table 3-7 Database configuration

Parameter	Description
Password	<ul style="list-style-type: none"> • Configure (default value): Configure the password when you are creating the DB instance. • Skip: The system does not set an initial password for you. <p>NOTICE To log in, you will have to reset a password for the DB instance. After a DB instance is created, you can reset the password. For details, see Resetting the Administrator Password.</p>
Administrator	The default login name for the database is rdsuser .
Administrator Password	<p>Must consist of 8 to 32 characters and contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters (~!@#%\$%^*_+?,.). Enter a strong password. Periodically change it to improve security and prevent security risks such as brute force cracking.</p> <p>Keep this password secure. The system cannot retrieve it.</p> <p>After a DB instance is created, you can reset this password. For details, see Resetting the Administrator Password.</p>
Confirm Password	Must be the same as Administrator Password .
Parameter Template	<p>Contains engine configuration values that can be applied to one or more DB instances. If you intend to create primary/standby DB instances, they use the same parameter template. You can modify instance parameters as required after the DB instance is created.</p> <p>NOTICE If you use a custom parameter template when creating a DB instance, the specification-related parameter max server memory (MB) in the custom template is not delivered. Instead, the default value is used.</p> <p>You can modify the instance parameters as required after the DB instance is created. For details, see section Modifying Parameters in a Parameter Template.</p>
Enterprise Project	<p>If the DB instance has been associated with an enterprise project, select the target project from the Enterprise Project drop-down list.</p> <p>You can also go to the ProjectMan console to create a project. For details about how to create a project, see the <i>ProjectMan User Guide</i>.</p>

Table 3-8 AD domain

Parameter	Description
AD Domain	<p>Allows an Active Directory user to authenticate with Microsoft SQL Server DB instances.</p> <p>Active Directory, which is short for AD, is a directory service on Windows Standard Server, Windows Enterprise Server, and Windows Datacenter Server. Active Directory stores information about objects on the network and makes this information easy for administrators and users to find and use. Active Directory uses a structured data store as the basis for a logical, hierarchical organization of directory information.</p> <p>NOTICE</p> <ol style="list-style-type: none"> 1. When you configure an AD domain information during the DB instance creation, do not configure or disable Group Policy Object (GPO) for your domain controller server. Otherwise, the DB instance creation will fail. 2. If GPO is required, you need to buy an ECS and set up a new domain controller server with GPO disabled. Then, establish trust between your domain controller server and the new domain controller server. For details, contact customer service. 3. The domain controller server time must be synchronized to an NTP server. Non-standard time or too large time difference may cause DB instance creation failures. <ul style="list-style-type: none"> • Skip: This option is selected by default. • Configure: To configure the AD domain, you must first prepare a domain controller on an ECS or on-premises database. Then, configure the directory address, domain name, directory administrator, and directory administrator password as required. <p>NOTE</p> <p>If a Microsoft SQL Server single DB instance is configured with the AD domain, it cannot be changed to primary/standby DB instances.</p> <p>DB instances of Microsoft SQL Server 2017 Enterprise Edition, 2017 Standard Edition, and 2017 Web Edition do not support AD domain configuration.</p>
Directory Address	<p>Enter the private IP address of the ECS that supports the AD domain. After the DB instance is created, you can view the directory address in the DB Information area on the Basic Information page.</p> <p>Example value: 192.168.x.x.</p>

Parameter	Description
Domain Name	A fully qualified domain name, such as DBStest.com, must: <ol style="list-style-type: none"> 1. Be the same as the ECS domain name. 2. Be no more than 48 characters long. 3. Only include letters, digits, dots (.), and hyphens (-). 4. Include a valid top-level domain name which contains at least 2 characters long and contains only dots (.) and letters, for example, .com 5. After the DB instance is created, you can view the directory address in the DB Information area on the Basic Information page.
Directory Administrator	You are advised to enter the domain administrator username.
Directory Administrator Password	Indicates the password of the directory administrator. Keep this password secure. The system cannot retrieve it.

Table 3-9 Tags

Parameter	Description
Tag	Tags an RDS DB instance. This configuration is optional. Adding tags to RDS DB instances helps you better identify and manage the DB instances. A maximum of 10 tags can be added for each DB instance. After a DB instance is created, you can view its tag details on the Tags page. For detailed operations, see Managing Tags .

Table 3-10 Purchase period

Parameter	Description
Required Duration	This option is available only for yearly/monthly DB instances. The system will automatically calculate the configuration fee based on the selected required duration. The longer the required duration is, the larger discount you will enjoy.
Auto-renew	<ul style="list-style-type: none"> • This option is available only for yearly/monthly DB instances and is not selected by default. • If you select this option, the auto-renew cycle is determined by the selected required duration.

Parameter	Description
Quantity	RDS supports batch creation of DB instances. If you intend to create primary/standby DB instances and set Quantity to 1 , a primary DB instance and a synchronous standby DB instance will be created.

If you have any questions about the price, click **Pricing details** at the bottom of the page.

 **NOTE**

The performance of your DB instance depends on its configurations. Hardware configuration items include the instance specifications, storage type, and storage space.

Step 6 Confirm the specifications for pay-per-use DB instances.

Figure 3-5 Specifications confirmation



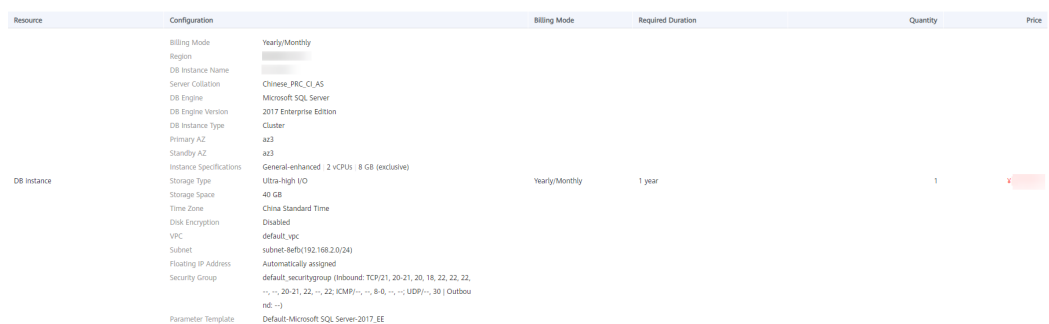
Resource	Configuration	Billing Mode	Quantity	Price	
DB Instance	Billing Mode	Pay-per-use			
	Region				
	DB Instance Name				
	Server Collation	Chinese_PRC_CI_AS			
	DB Engine	Microsoft SQL Server			
	DB Engine Version	2017 Enterprise Edition			
	DB Instance Type	Cluster			
	Primary AZ	ap3			
	Standby AZ	ap3			
	Instance Specifications	General-enhanced 2 vCPUs, 8 GB (exclusive)			
	Storage Type	Ultra-high I/O	Pay-per-use	1	 /hour
	Storage Space	40 GB			
	Time Zone	China Standard Time			
	Disk Encryption	Disabled			
VPC	default_vpc				
Subnet	subnet-8ef9192.168.2.0/24				
Floating IP Address	Automatically assigned				
Security Group	default_securitygroup (Inbound: TCP/21, 20-21, 20, 18, 22, 22, 22, --, --, 22, 22, --, 22, 22, --, 22, 22, --, 22; ICMP/--, --, 8-0, --, --, UDP/--, 30 Outbound: --)				
Parameter Template	Default-Microsoft SQL Server-2017_EE				


- If you need to modify your settings, click **Previous**.
- If you do not need to modify your settings, click **Submit**.

Skip **Step 7** and **Step 8** and go to **Step 9**.

Step 7 Confirm the order for yearly/monthly DB instances.

Figure 3-6 Order confirmation



Resource	Configuration	Billing Mode	Required Duration	Quantity	Price	
DB Instance	Billing Mode	Yearly/Monthly				
	Region					
	DB Instance Name					
	Server Collation	Chinese_PRC_CI_AS				
	DB Engine	Microsoft SQL Server				
	DB Engine Version	2017 Enterprise Edition				
	DB Instance Type	Cluster				
	Primary AZ	ap3				
	Standby AZ	ap3				
	Instance Specifications	General-enhanced 2 vCPUs, 8 GB (exclusive)				
	Storage Type	Ultra-high I/O	Yearly/Monthly	1 year	1	
	Storage Space	40 GB				
	Time Zone	China Standard Time				
	Disk Encryption	Disabled				
VPC	default_vpc					
Subnet	subnet-8ef9192.168.2.0/24					
Floating IP Address	Automatically assigned					
Security Group	default_securitygroup (Inbound: TCP/21, 20-21, 20, 18, 22, 22, 22, --, --, 22, 22, --, 22, 22, --, 22, 22, --, 22; ICMP/--, --, 8-0, --, --, UDP/--, 30 Outbound: --)					
Parameter Template	Default-Microsoft SQL Server-2017_EE					


- If you need to modify your settings, click **Previous**.
- Otherwise, click **Pay Now**.

Step 8 Select a payment method and complete the payment.

 **NOTE**

This operation applies only to the yearly/monthly billing mode.

Step 9 To view and manage the DB instance, go to the **Instance Management** page.

- During the creation process, the DB instance status is **Creating**.
- To refresh the DB instance list, click  in the upper right corner of the list. When the creation process is complete, the instance status will change to **Available**.
- The automated backup policy is enabled by default. An automated full backup is immediately triggered after a DB instance is created.
- After a DB instance is created, you can enter a description for it.
- The default database port number is **1433**. After a DB instance is created, you can change its port number.

 **NOTE**

You are advised to change the database port in a timely manner.
For details, see [Changing the Database Port](#).

----End

Related Operations

[Creating a DB Instance Using an API](#)


3.2.3 Step 2: Connect to a DB Instance Through DAS

Scenarios

DAS enables you to manage databases on a web-based console and supports SQL execution, advanced database management, and intelligent O&M, simplifying database management and improving working efficiency and data security. The permission of connecting DB instances through DAS is enabled by default. You are advised to use this connection method.

Procedure

Step 1 Log in to the management console.

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

Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

Step 4 On the **Instance Management** page, locate the target DB instance and click **Log In** in the **Operation** column.

Alternatively, click the target DB instance on the **Instance Management** page. On the displayed **Basic Information** page, click **Log In** in the upper right corner of the page.

- Step 5** On the displayed login page, enter the correct username and password and click **Log In**.
----End

Follow-up Operations

After logging in to the DB instance, you can create or migrate databases.

- [Creating a Microsoft SQL Server Database Using an API](#)
- [Managing Microsoft SQL Server Databases Using DAS](#)
- [Migrating Microsoft SQL Server Databases Using DRS](#)

3.3 Connecting to a DB Instance Through a Private Network

3.3.1 Overview

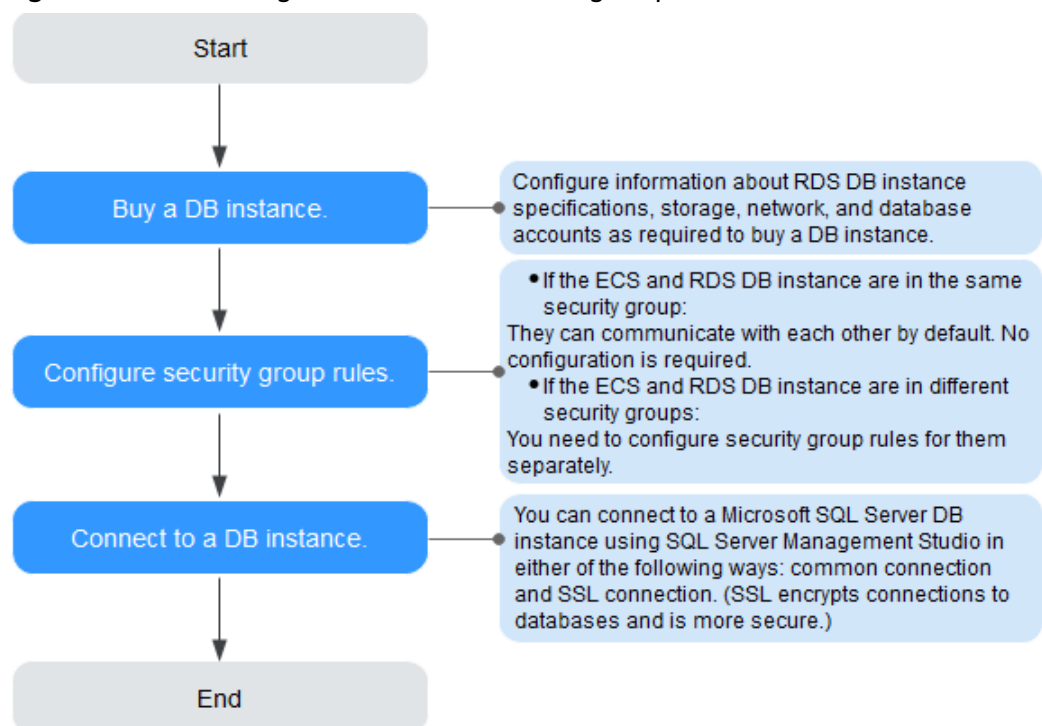
This section describes how to buy a SQL Server DB instance on the management console and connect to the DB instance through an ECS.

If you are using RDS for the first time, see the constraints described in section [Microsoft SQL Server Constraints](#).

Process

Figure 3-7 illustrates the process of connecting to a Microsoft SQL Server DB instance through a private network.

Figure 3-7 Connecting to a DB instance through a private network



- **Step 1: Buy a DB instance.** Confirm the specifications, storage, network, and database account configurations of the SQL Server DB instances based on service requirements.
- **Step 2: Configure security group rules.**
 - If the ECS and RDS DB instance are in the same security group, they can communicate with each other by default. No security group rule needs to be configured. Go to **Step 3: Connect to a DB Instance Through a Private Network.**
 - If the ECS and RDS DB instance are in different security groups, you need to configure security group rules for them, separately.
 - RDS DB instance: Configure an **inbound rule** for the security group with which the RDS DB instance is associated.
 - ECS: The default security group rule allows all outgoing data packets. In this case, you do not need to configure a security rule for the ECS. If not all outbound traffic is allowed in the security group, you need to configure an **outbound rule** for the ECS.
- **Step 3: Connect to a DB instance through a private network.** You can connect to a DB instance through a common connection or an SSL connection. The SSL connection encrypts data and is more secure.

3.3.2 Step 1: Buy a DB Instance

Scenarios

This section describes how to create a DB instance on the RDS console.

Currently, RDS for SQL Server supports the yearly/monthly and pay-per-use billing modes. The DB instance class and storage space you need depend on your processing power and memory requirements.

Prerequisites

- You have registered a HUAWEI CLOUD account.
- After registering a HUAWEI CLOUD account, you can create an IAM user or user group on the IAM console and grant it specific operation permissions, to perform refined management on HUAWEI CLOUD. For details, see [Creating a User and Granting Permissions](#).
- Your account balance is greater than or equal to ¥0.

Procedure

Step 1 Log in to the management console.

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

Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

Step 4 On the **Instance Management** page, click **Buy DB Instance**.

Step 5 On the displayed page, select a billing mode, configure information about your DB instance. Then, click **Next**.

Figure 3-8 Billing mode and basic information

RDS provides the following billing modes:

Yearly/Monthly

If you select this billing mode, skip **Step 6** and go to **Step 7**.

Pay-per-use

If you select this billing mode, go to **Step 6**.

Table 3-11 Basic information

Parameter	Description
Region	The region your RDS resources will be located. You can change it on the creation page, or go back to the Instance Management page and change it in the upper left corner. NOTE Products in different regions cannot communicate with each other through a private network and you cannot change the region of a DB instance after creating the instance. Therefore, exercise caution when selecting a region.
DB Instance Name	Must start with a letter and consist of 4 to 64 characters. Only letters, digits, hyphens (-), and underscores (_) are allowed. <ul style="list-style-type: none"> If you intend to create multiple DB instances and read replicas, the length of each DB name will change. If you create multiple DB instances at a time, they will be named with four digits appended to the DB instance name. For example, if you enter instance, the first instance will be named as instance-0001, the second as instance-0002, and so on.
DB Engine	Set to Microsoft SQL Server .

Parameter	Description
DB Engine Version	<p>For details, see DB Engines and Versions.</p> <p>Different DB engine versions are supported in different regions.</p> <p>If you use a Microsoft SQL Server database, select a proper DB engine version based on service requirements. You are advised to select the latest available version because it is more stable, reliable, and secure.</p>
DB Instance Type	<ul style="list-style-type: none"> <p>• Primary/Standby: uses the HA architecture with a primary DB instance and a synchronous standby DB instance. It is suitable for production databases of large- and medium-sized enterprises in Internet, Internet of Things (IoT), retail e-commerce sales, logistics, gaming, and other sectors. The standby DB instance improves instance reliability and is invisible to you after being created.</p> <p>An AZ is a physical region where resources use independent power supply and networks. AZs are physically isolated but interconnected through an internal network. Some regions support both single AZs and multiple AZs and some only support single AZs.</p> <p>To achieve higher reliability, RDS will automatically deploy your primary and standby instances in different physical servers even if you deploy primary/standby DB instances in the same AZ. If you attempt to create primary/standby DB instances in the same AZ in a Dedicated Computing Cluster (DCC) and there is only one physical server available, the creation will fail.</p> <p>RDS supports deploying primary and standby DB instances in an AZ or across AZs. You can determine whether the standby AZ is the same as the primary AZ.</p> <ul style="list-style-type: none"> - If they are the same (default setting), the primary and standby DB instances are deployed in the same AZ. - If they are different, the primary and standby DB instances are deployed in different AZs to ensure failover support and high availability. <p>• Single: uses the single-node architecture, which is more cost-effective than mainstream primary/standby DB instances. It is suitable for developing and testing of microsites, and small- and medium-sized enterprises, or for learning about RDS.</p>

Parameter	Description
Storage Type	<p>Determines the DB instance read/write speed. The higher the maximum throughput is, the higher the DB instance read/write speed can be.</p> <ul style="list-style-type: none"> • Ultra-high I/O: supports a maximum throughput of 350 MB/s. <p>NOTE If you select DSS for Resource Type, only the storage type that you have selected when buying the DSS service is displayed by default.</p>
Time Zone	<p>Select your time zone when you are creating a DB instance. After the DB instance is created, the time zone cannot be modified. For details, see Table 3-12.</p>
Server Collation	<p>Defines a collation of a database or table column, or a collation cast operation when applied to character string expression. It acts as the default collation for the DB instance.</p>

Table 3-12 Mapping between time zones and UTC offsets

Time Zone	Standard Time Offset	Remarks
Afghanistan Standard Time	UTC+04:30	Kabul
Alaskan Standard Time	UTC-09:00	Alaska
Arabian Standard Time	UTC+04:00	Abu Dhabi, Muscat
Atlantic Standard Time	UTC-04:00	Atlantic Time (Canada)
AUS Central Standard Time	UTC+09:30	Darwin
AUS Eastern Standard Time	UTC+10:00	Canberra, Melbourne, Sydney
Belarus Standard Time	UTC+03:00	Minsk
Canada Central Standard Time	UTC-06:00	Saskatchewan
Cape Verde Standard Time	UTC-01:00	Cape Verde Is.
Gen. Australia Standard Time	UTC+09:30	Adelaide
Central America Standard Time	UTC-06:00	Central America

Time Zone	Standard Time Offset	Remarks
Central Asia Standard Time	UTC+06:00	Astana
Central Brazilian Standard Time	UTC-04:00	Cuiaba
Central European Standard Time	UTC+01:00	Belgrade, Bratislava, Budapest, Ljubljana, Prague
Central European Standard Time	UTC+01:00	Sarajevo, Skopje, Warsaw, Zagreb
Central Pacific Standard Time	UTC+11:00	Solomon Islands, New Caledonia
Central Standard Time	UTC-06:00	Central Time (US and Canada)
China Standard Time	UTC+08:00	Beijing, Chongqing, Hong Kong, and Urumqi
E. Africa Standard Time	UTC+03:00	Nairobi
E. Australia Standard Time	UTC+10:00	Brisbane
E. Europe Standard Time	UTC+02:00	Chisinau
E. South America Standard Time	UTC-03:00	Brasilia
Eastern Standard Time	UTC-05:00	Eastern Time (US and Canada)
Georgian Standard Time	UTC+04:00	Tbilisi
GMT Standard Time	UTC	Dublin, Edinburgh, Lisbon, London
Greenland Standard Time	UTC-03:00	Greenland
Greenwich Standard Time	UTC	Monrovia, Reykjavik
GTB Standard Time	UTC+02:00	Athens, Bucharest
Hawaiian Standard Time	UTC-10:00	Hawaii
India Standard Time	UTC+05:30	Chennai, Kolkata, Mumbai, New Delhi
Jordan Standard Time	UTC+02:00	Amman
Korea Standard Time	UTC+09:00	Seoul

Time Zone	Standard Time Offset	Remarks
Middle East Standard Time	UTC+02:00	Beirut
Mountain Standard Time	UTC-07:00	Mountain Time (US and Canada)
US Mountain Standard Time	UTC-07:00	Arizona
New Zealand Standard Time	UTC+12:00	Auckland, Wellington
Newfoundland Standard Time	UTC-03:30	Newfoundland
Pacific SA Standard Time	UTC-03:00	Santiago
Pacific Standard Time	UTC-08:00	Pacific Time (US and Canada)
Russian Standard Time	UTC+03:00	Moscow/St. Petersburg
SA Pacific Standard Time	UTC-05:00	Bogota, Lima, Quito, Rio Branco
SE Asia Standard Time	UTC+07:00	Bangkok, Hanoi, Jakarta
China Standard Time	UTC+08:00	Kuala Lumpur, Singapore
Tokyo Standard Time	UTC+09:00	Osaka, Sapporo, Tokyo
US Eastern Standard Time	UTC-05:00	Indiana (East)
UTC	UTC	Coordinated Universal Time
UTC-02	UTC-02:00	Coordinated Universal Time-02
UTC-08	UTC-08:00	Coordinated Universal Time-08
UTC-09	UTC-09:00	Coordinated Universal Time-09
UTC-11	UTC-11:00	Coordinated Universal Time-11
UTC+12	UTC+12:00	Coordinated Universal Time+12
W. Australia Standard Time	UTC+08:00	Perth
W. Central Africa Standard Time	UTC+01:00	West Central Africa

Time Zone	Standard Time Offset	Remarks
W. Europe Standard Time	UTC+01:00	Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna

Figure 3-9 DB instance specifications

The screenshot displays the configuration options for a DB instance. The 'Instance Class' is set to 'General-enhanced'. Under 'vCPU | Memory', five options are listed:

vCPU Memory	IPv6
<input checked="" type="radio"/> 2 vCPUs 8 GB (exclusive)	Supported
<input type="radio"/> 2 vCPUs 16 GB (exclusive)	Not supported
<input type="radio"/> 4 vCPUs 8 GB (exclusive)	Supported
<input type="radio"/> 4 vCPUs 16 GB (exclusive)	Supported
<input type="radio"/> 4 vCPUs 32 GB (exclusive)	Not supported

The 'Storage Space (GB)' is set to 40 GB on a slider ranging from 40 to 4000 GB. The 'Disk Encryption' is set to 'Enable', which is the recommended option.

Table 3-13 Instance specifications

Parameter	Description
Instance Class	<p>Refers to the CPU and memory of a DB instance. Different instance classes have different numbers of database connections and different maximum IOPS.</p> <p>For details about instance classes, see DB Instance Classes.</p> <p>RDS DB instances have the following specifications:</p> <ul style="list-style-type: none"> • General: The allocated memory and I/O resources are exclusive. The vCPUs and storage space are shared by general DB instances on the same physical server. Storage size is not bound to vCPUs and memory and can be flexibly configured. In this way, the utilization rate is maximized and cost effectiveness is improved. The shared specifications are suitable for users who have a small budget and have low requirements on performance stability. • Exclusive: The vCPUs, memory, storage space, and I/O resources are exclusive. The performance is stable and is not affected by other DB instances on the same physical server. The premium configuration is that a DB instance exclusively occupies all resources of a physical server. The exclusive specifications are suitable for database-centered scenarios such as finance, e-commerce, government, and large- and medium-scale Internet business. <p>After a DB instance is created, you can change its CPU and memory. For details, see Changing a DB Instance Class.</p> <p>NOTE DB instances in a DCC only support the general-enhanced instance class.</p>
Resource Type	<ul style="list-style-type: none"> • EVS • DSS <p>NOTE This option is displayed only when you buy the DSS service.</p>
Storage Pool	<p>Displayed only when you select DSS for Resource Type. The storage pool is secure because it is physically isolated from other pools.</p>
Storage Space (GB)	<p>Contains the file system overhead required for inode, reserved block, and database operation. Can range in size from 40 GB to 4,000 GB and can be scaled up only by a multiple of 10 GB.</p> <p>After a DB instance is created, you can scale up its storage space. For details, see Scaling Up Storage Space.</p>

Parameter	Description
Disk Encryption	<ul style="list-style-type: none"> • Disabled: indicates the encryption function is disabled. • Enabled: indicates the encryption function is enabled, improving data security but affecting system performance. <p>Key Name: indicates the tenant key. You can create or select a key.</p> <p>NOTE</p> <ul style="list-style-type: none"> - Once the DB instance is created, you cannot modify the disk encryption status or change the key. The backup data stored in OBS is not encrypted. - After an RDS DB instance is created, do not disable or delete the key that is being used. Otherwise, RDS will be unavailable and data cannot be restored. - For details about how to create a key, see the "Creating a CMK" section in the <i>Data Encryption Workshop User Guide</i>.

Table 3-14 Database Security Service

Parameter	Description
DBSS	<p>Prevents database attacks, ensuring database security on the cloud.</p> <ul style="list-style-type: none"> • After you subscribe to Database Security Service (DBSS), you cannot buy DB instances in patches. • Only DB instances of certain specifications support the purchase of RDS and DBSS together. • The DBSS administrator is admin, and the password is the same as that of the RDS root user. • After you subscribe to DBSS, log in to the DBSS console, associate an EIP with the DBSS instance and configure security protection.

Figure 3-10 Network and database configuration

The screenshot shows the configuration page for an RDS instance. It includes sections for VPC (set to vpc-02), Security Group (set to Sys-default), Password (with fields for Administrator Password and Confirm Password), Parameter Template (set to Default-Microsoft SQL Server-2017_EE), Enterprise Project (set to default), Tag (with fields for Tag key and Tag value), Required Duration (set to 1 year), and Quantity (set to 1).

Table 3-15 Network

Parameter	Description
VPC	<p>A dedicated virtual network in which your RDS DB instances are located. A VPC can isolate networks for different services. You can select an existing VPC or create a VPC. For details on how to create a VPC, see the "Creating a VPC" section in the <i>Virtual Private Cloud User Guide</i>.</p> <p>If no VPC is available, RDS allocates a VPC to you by default.</p> <p>NOTICE After the DB instance is created, the VPC cannot be changed.</p>
Subnet	<p>Improves network security by providing dedicated network resources that are logically isolated from other networks. Subnets take effect only within an AZ. The Dynamic Host Configuration Protocol (DHCP) function is enabled by default for subnets in which you plan to create RDS DB instances and cannot be disabled.</p> <p>A floating IP address is automatically assigned when you create a DB instance. You can also enter an unused floating IP address in the subnet CIDR block. After the DB instance is created, you can change the floating IP address.</p>
Security Group	<p>Enhances security by controlling access to RDS from other services. You need to add rules to a security group so that you can connect to your DB instance.</p> <p>If no security group is available, RDS allocates a security group to you by default.</p> <p>NOTE To configure the Active Directory (AD) domain for the DB instance, ensure that the DB instance and domain controller must be in the same security group.</p>

Table 3-16 Database configuration

Parameter	Description
Password	<ul style="list-style-type: none"> • Configure (default value): Configure the password when you are creating the DB instance. • Skip: The system does not set an initial password for you. <p>NOTICE To log in, you will have to reset a password for the DB instance. After a DB instance is created, you can reset the password. For details, see Resetting the Administrator Password.</p>
Administrator	The default login name for the database is rdsuser .
Administrator Password	<p>Must consist of 8 to 32 characters and contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters (~!@#%\$%^*_+?,.). Enter a strong password. Periodically change it to improve security and prevent security risks such as brute force cracking.</p> <p>Keep this password secure. The system cannot retrieve it.</p> <p>After a DB instance is created, you can reset this password. For details, see Resetting the Administrator Password.</p>
Confirm Password	Must be the same as Administrator Password .
Parameter Template	<p>Contains engine configuration values that can be applied to one or more DB instances. If you intend to create primary/standby DB instances, they use the same parameter template. You can modify instance parameters as required after the DB instance is created.</p> <p>NOTICE If you use a custom parameter template when creating a DB instance, the specification-related parameter max server memory (MB) in the custom template is not delivered. Instead, the default value is used.</p> <p>You can modify the instance parameters as required after the DB instance is created. For details, see section Modifying Parameters in a Parameter Template.</p>
Enterprise Project	<p>If the DB instance has been associated with an enterprise project, select the target project from the Enterprise Project drop-down list.</p> <p>You can also go to the ProjectMan console to create a project. For details about how to create a project, see the <i>ProjectMan User Guide</i>.</p>

Table 3-17 AD domain

Parameter	Description
AD Domain	<p>Allows an Active Directory user to authenticate with Microsoft SQL Server DB instances.</p> <p>Active Directory, which is short for AD, is a directory service on Windows Standard Server, Windows Enterprise Server, and Windows Datacenter Server. Active Directory stores information about objects on the network and makes this information easy for administrators and users to find and use. Active Directory uses a structured data store as the basis for a logical, hierarchical organization of directory information.</p> <p>NOTICE</p> <ol style="list-style-type: none"> 1. When you configure an AD domain information during the DB instance creation, do not configure or disable Group Policy Object (GPO) for your domain controller server. Otherwise, the DB instance creation will fail. 2. If GPO is required, you need to buy an ECS and set up a new domain controller server with GPO disabled. Then, establish trust between your domain controller server and the new domain controller server. For details, contact customer service. 3. The domain controller server time must be synchronized to an NTP server. Non-standard time or too large time difference may cause DB instance creation failures. <ul style="list-style-type: none"> • Skip: This option is selected by default. • Configure: To configure the AD domain, you must first prepare a domain controller on an ECS or on-premises database. Then, configure the directory address, domain name, directory administrator, and directory administrator password as required. <p>NOTE</p> <p>If a Microsoft SQL Server single DB instance is configured with the AD domain, it cannot be changed to primary/standby DB instances.</p> <p>DB instances of Microsoft SQL Server 2017 Enterprise Edition, 2017 Standard Edition, and 2017 Web Edition do not support AD domain configuration.</p>
Directory Address	<p>Enter the private IP address of the ECS that supports the AD domain. After the DB instance is created, you can view the directory address in the DB Information area on the Basic Information page.</p> <p>Example value: 192.168.x.x.</p>

Parameter	Description
Domain Name	A fully qualified domain name, such as DBStest.com, must: <ol style="list-style-type: none"> 1. Be the same as the ECS domain name. 2. Be no more than 48 characters long. 3. Only include letters, digits, dots (.), and hyphens (-). 4. Include a valid top-level domain name which contains at least 2 characters long and contains only dots (.) and letters, for example, .com 5. After the DB instance is created, you can view the directory address in the DB Information area on the Basic Information page.
Directory Administrator	You are advised to enter the domain administrator username.
Directory Administrator Password	Indicates the password of the directory administrator. Keep this password secure. The system cannot retrieve it.

Table 3-18 Tags

Parameter	Description
Tag	Tags an RDS DB instance. This configuration is optional. Adding tags to RDS DB instances helps you better identify and manage the DB instances. A maximum of 10 tags can be added for each DB instance. After a DB instance is created, you can view its tag details on the Tags page. For detailed operations, see Managing Tags .

Table 3-19 Purchase period


Parameter	Description
Required Duration	This option is available only for yearly/monthly DB instances. The system will automatically calculate the configuration fee based on the selected required duration. The longer the required duration is, the larger discount you will enjoy.
Auto-renew	<ul style="list-style-type: none"> • This option is available only for yearly/monthly DB instances and is not selected by default. • If you select this option, the auto-renew cycle is determined by the selected required duration.

Step 8 Select a payment method and complete the payment.

 **NOTE**

This operation applies only to the yearly/monthly billing mode.

Step 9 To view and manage the DB instance, go to the **Instance Management** page.

- During the creation process, the DB instance status is **Creating**.
- To refresh the DB instance list, click  in the upper right corner of the list. When the creation process is complete, the instance status will change to **Available**.
- The automated backup policy is enabled by default. An automated full backup is immediately triggered after a DB instance is created.
- After a DB instance is created, you can enter a description for it.
- The default database port number is **1433**. After a DB instance is created, you can change its port number.

 **NOTE**

You are advised to change the database port in a timely manner.
For details, see [Changing the Database Port](#).

----End

Related Operations

[Creating a DB Instance Using an API](#)

3.3.3 Step 2: Configure Security Group Rules

Scenarios

A security group is a collection of access control rules for ECSs and RDS DB instances that have the same security protection requirements and are mutually trusted in a VPC.

This section describes how to create a security group to enable specific IP addresses and ports to access RDS.

Check whether the ECS and RDS DB instance are in the same security group.

- If the ECS and RDS DB instance are in the same security group, they can communicate with each other by default. No security group rule needs to be configured. Go to [Step 3: Connect to a DB Instance Through a Private Network](#).
- If the ECS and RDS DB instance are in different security groups, you need to configure security group rules for them, separately.
 - RDS DB instance: Configure an **inbound rule** for the security group with which the RDS DB instance is associated.
 - ECS: The default security group rule allows all outgoing data packets. In this case, you do not need to configure a security rule for the ECS. If not

all outbound traffic is allowed in the security group, you need to configure an **outbound rule** for the ECS.

This section describes how to configure an inbound rule for an RDS DB instance.

For details about the requirements of security group rules, see the [Adding a Security Group Rule](#) section in the *Virtual Private Cloud User Guide*.

Precautions

The default security group rule allows all outgoing data packets. ECSs and RDS DB instances can access each other if they are deployed in the same security group. After a security group is created, you can configure security group rules to control access from and to the DB instances in the security group.

- By default, you can create a maximum of 500 security group rules.
- Too many security group rules will increase the first packet latency. You are advised to create a maximum of 50 rules for each security group.
- To access an RDS DB instance from resources outside the security group, you need to configure an **inbound rule** for the security group associated with the RDS DB instance.

NOTE

To ensure security of data and DB instances, you are advised to use the principle of least privilege for database access. Change the database port (default value: **3306**), and set the IP address to the remote server's address or any IP address in the remote server's smallest subnet to control the access scope of the remote server.

If you use **0.0.0.0/0**, you enable all IP addresses to access RDS DB instances in the security group.

For details about the requirements of security group rules, see the [Adding a Security Group Rule](#) section in the *Virtual Private Cloud User Guide*.

Procedure

Step 1 Log in to the management console.

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

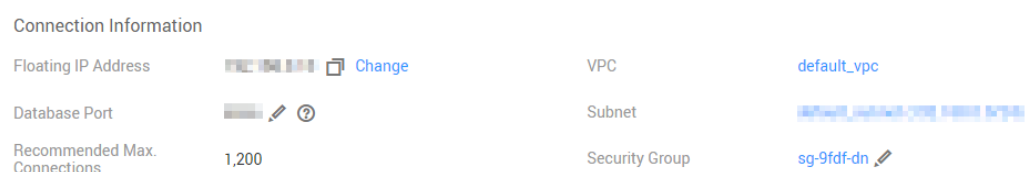
Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

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

Step 5 Configure security group rules.

In the **Connection Information** area, click the security group.

Figure 3-13 Connection information



Step 6 On the inbound rule tab, click **Add Rule**. In the displayed dialog box, set required parameters to add an inbound rule.

You can click + to add more inbound rules.

Figure 3-14 Adding an inbound rule

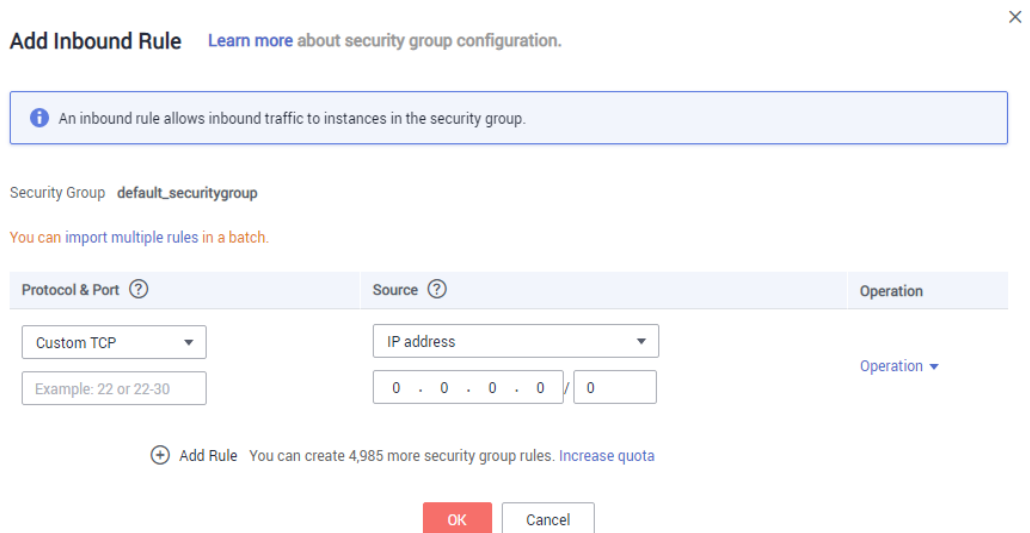


Table 3-20 Inbound rule parameter description

Parameter	Description	Example Value
Protocol & Port	Specifies the network protocol. Currently, the value can be All , TCP , UDP , ICMP , GRE , or others.	Custom TCP
	Port: specifies the port or port range over which the traffic can reach your ECS. Common ports are listed in Common Ports Used by ECSs .	When connecting to the DB instance through a private network, enter the port of the target DB instance.
Source	Specifies the source of the security group rule. The value can be another security group or a single IP address. For example: <ul style="list-style-type: none"> • xxx.xxx.xxx.xxx/32 (IPv4 address) • xxx.xxx.xxx.0/24 (subnet) • 0.0.0.0/0 (any IP address) 	0.0.0.0/0

Parameter	Description	Example Value
Description	<p>Provides supplementary information about the security group rule. This parameter is optional.</p> <p>The description can contain a maximum of 255 characters and cannot contain angle brackets (<) or (>).</p>	-

----End

3.3.4 Step 3: Connect to a DB Instance Through a Private Network

You can connect to a DB instance through a common connection or an SSL connection. The SSL connection encrypts data and is more secure.

Preparations


1. Prepare an ECS.

To connect to a DB instance through a private network, you must first buy an ECS.

For details about how to create and connect to an ECS, see [How Can I Create and Connect to an ECS?](#)

- The ECS and RDS DB instance must be in the same VPC.
- The ECS must be allowed by the security group to access RDS DB instances.
 - If the security group to which the target DB instance belongs is the default security group, you do not need to configure security group rules.
 - If the security group to which the target DB instance belongs is not the default security group, check whether the security group rules allow the ECS to connect to the DB instance.

- 1) Log in to the management console.

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

- 3) Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

- 4) On the **Instance Management** page, click the target DB instance.

- 5) In the **Connection Information** area, click the security group to view its rules.

If the security group rules allow the access from the ECS, the ECS can connect to the DB instance.

If the security group rules do not allow the access from the ECS, you need to add a security group rule. For details, see section [Step 2: Configure Security Group Rules](#).

2. Install the Microsoft SQL Server client.

Install the Microsoft SQL Server client on the ECS or device that was prepared in 1.

For details, see [How Can I Install SQL Server Management Studio?](#)

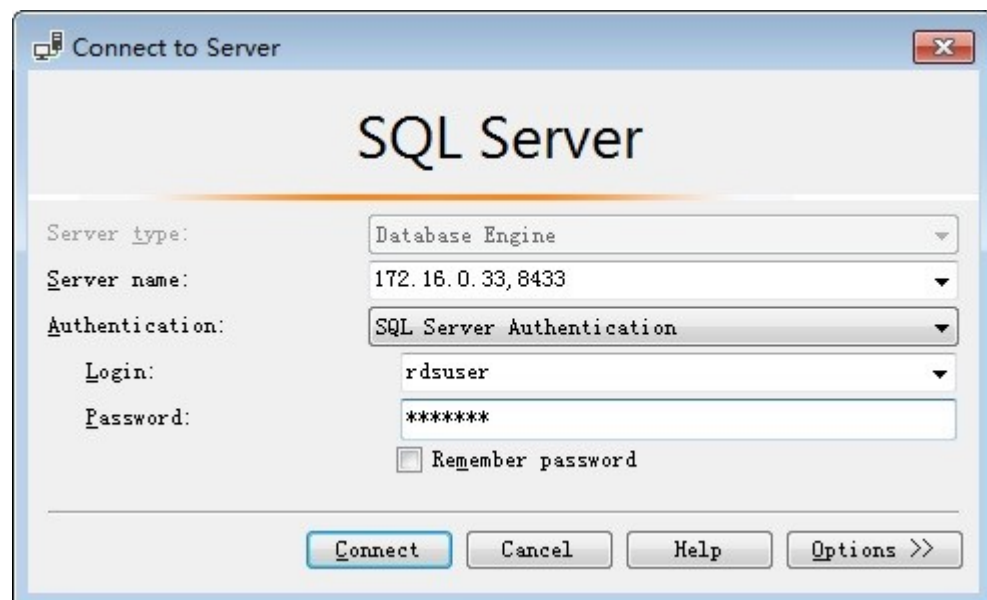
Common Connection

Step 1 Log in to the ECS or device that can access RDS.

Step 2 Start SQL Server Management Studio.

Step 3 Choose **Connect > Database Engine**. In the displayed dialog box, enter login information.

Figure 3-15 Connecting to the server



- **Server name:** indicates the IP address and port of the DB instance. Use a comma (,) to separate them. For example: x.x.x.x,8080.
 - The IP address is the floating IP address in the **Connection Information** area on the **Basic Information** page of the DB instance.
 - The port is the database port in the **Connection Information** area on the **Basic Information** page of the DB instance.
- **Authentication:** indicates the authentication mode. Select **SQL Server Authentication**.
- **Login:** indicates the RDS database username. The default administrator is **rdsuser**.
- **Password:** indicates the password of the RDS database username.

Step 4 Click **Connect** to connect to the DB instance.


 **NOTE**

If the connection fails, ensure that preparations have been correctly made in [Preparations](#) and try again.

----End

SSL Connection

Step 1 Download the SSL root certificate and then upload it.

1. In the **DB Information** area on the **Basic Information** page, click  in the **SSL** field to download the root certificate or certificate bundle.
2. Upload the root certificate to the ECS or save it to the device to be connected to the DB instance.
3. Import the root certificate into Windows OS on the ECS. For details, see [How Can I Import the Root Certificate to the Windows OS?](#)

Step 2 Start SQL Server Management Studio.

Step 3 Choose **Connect > Database Engine**. In the displayed dialog box, enter login information.

Figure 3-16 Connecting to the server

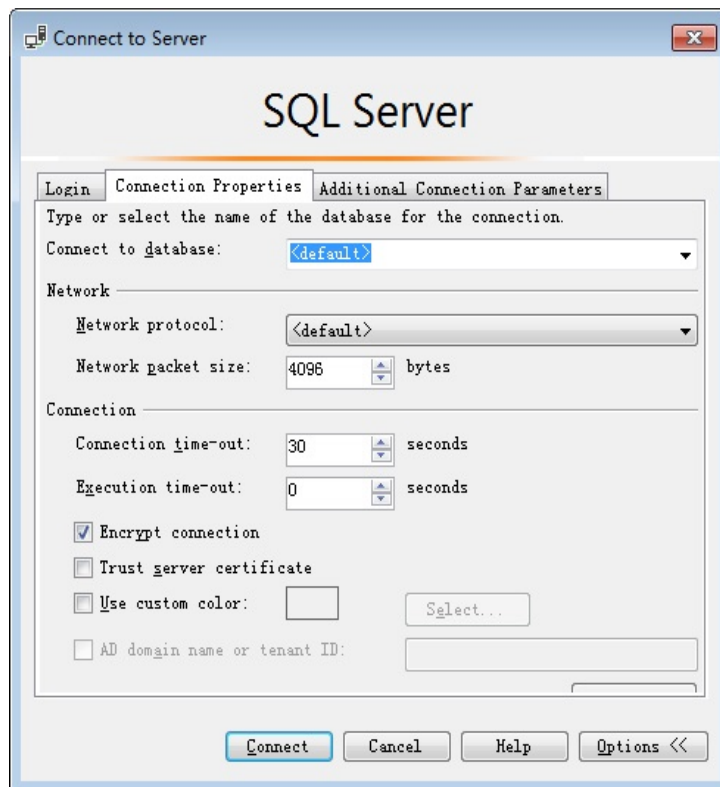


- **Server name:** indicates the IP address and port of the DB instance. Use a comma (,) to separate them. For example: x.x.x.x,8080.
 - The IP address is the floating IP address in the **Connection Information** area on the **Basic Information** page of the DB instance.
 - The port is the database port in the **Connection Information** area on the **Basic Information** page of the DB instance.
- **Authentication:** indicates the authentication mode. Select **SQL Server Authentication**.

- **Login:** indicates the RDS database username. The default administrator is **rdsuser**.
- **Password:** indicates the password of the RDS database username.

Step 4 On the **Connection Properties** page, enter related parameters and select **Encrypt connection** to enable SSL encryption. (By default, **Encrypt connection** is not selected. You need to select it manually.)

Figure 3-17 Connection properties



Step 5 Click **Connect** to connect to the DB instance.

NOTE

If the connection fails, ensure that preparations have been correctly made in [Preparations](#) and try again.

----End

FAQs

[What Should I Do If I Fail to Connect to an RDS DB Instance?](#)

Follow-up Operations

After logging in to the DB instance, you can create or migrate databases.

- [Creating a Microsoft SQL Server Database Using an API](#)
- [Managing Microsoft SQL Server Databases Using DAS](#)
- [Migrating Microsoft SQL Server Databases Using DRS](#)

3.4 Connecting to a DB Instance Through a Public Network

3.4.1 Overview

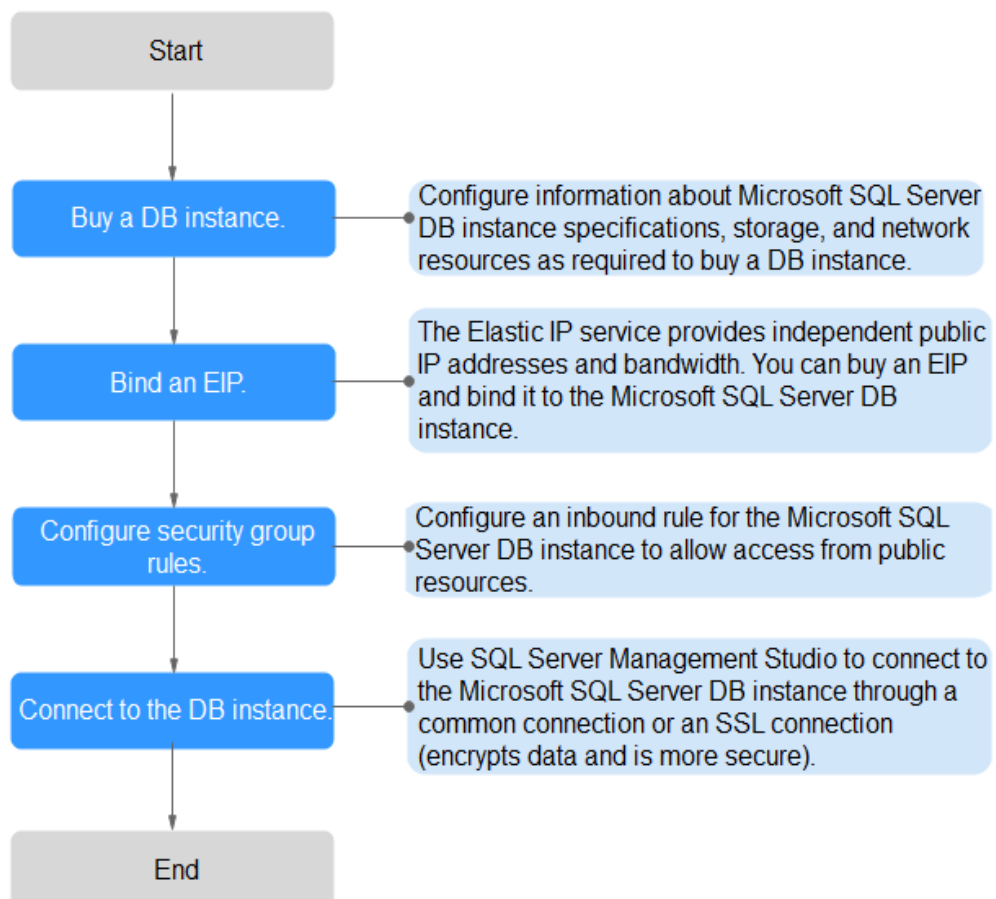
This section describes how to buy a SQL Server DB instance on the management console and bind an EIP to the DB instance to make the instance publicly accessible.

If you are using RDS for the first time, see the constraints described in section [Microsoft SQL Server Constraints](#).

Process

Figure 3-18 illustrates the process of connecting to a Microsoft SQL Server DB instance through a public network.

Figure 3-18 Connecting to a DB instance through a public network



- **Step 1: Buy a DB instance.** Confirm the specifications, storage, network, and database account configurations of the SQL Server DB instances based on service requirements.

- **Step 2: Bind an EIP.** The Elastic IP service provides independent public IP addresses and bandwidth for Internet access. You can apply for an EIP on the VPC console and bind the EIP to the RDS DB instance.
- **Step 3: Configure security group rules.** To access an RDS DB instance from resources outside the security group, you need to configure an **inbound rule** for the security group associated with the RDS DB instance.
- **Step 4: Connect to a DB instance from a public network.** You can use SQL Server Management Studio to connect to a DB instance through a common connection or an SSL connection. The SSL connection encrypts data and is more secure.

3.4.2 Step 1: Buy a DB Instance

Scenarios

This section describes how to create a DB instance on the RDS console.

Currently, RDS for SQL Server supports the yearly/monthly and pay-per-use billing modes. The DB instance class and storage space you need depend on your processing power and memory requirements.

Prerequisites

- You have registered a HUAWEI CLOUD account.
- After registering a HUAWEI CLOUD account, you can create an IAM user or user group on the IAM console and grant it specific operation permissions, to perform refined management on HUAWEI CLOUD. For details, see [Creating a User and Granting Permissions](#).
- Your account balance is greater than or equal to ¥0.

Procedure


- Step 1** Log in to the management console.
- Step 2** Click  in the upper left corner and select a region and a project.
- Step 3** Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.
- Step 4** On the **Instance Management** page, click **Buy DB Instance**.
- Step 5** On the displayed page, select a billing mode, configure information about your DB instance. Then, click **Next**.

Figure 3-19 Billing mode and basic information

The screenshot shows the configuration page for a new RDS instance. The 'Billing Mode' is set to 'Yearly/Monthly'. The 'DB Engine' is 'Microsoft SQL Server'. The 'DB Engine Version' is '2017 Enterprise Edition'. The 'DB Instance Type' is 'Cluster'. The 'Storage Type' is 'Ultra-high I/O'. The 'Primary AZ' and 'Standby AZ' are both set to 'az3'. The 'Time Zone' is 'UTC+08:00 Beijing, Chongqing, Hong K...'. The 'Server Collation' is 'Chinese_PRC_CI_AS'.

RDS provides the following billing modes:

Yearly/Monthly

If you select this billing mode, skip **Step 6** and go to **Step 7**.

Pay-per-use

If you select this billing mode, go to **Step 6**.

Table 3-21 Basic information

Parameter	Description
Region	The region your RDS resources will be located. You can change it on the creation page, or go back to the Instance Management page and change it in the upper left corner. NOTE Products in different regions cannot communicate with each other through a private network and you cannot change the region of a DB instance after creating the instance. Therefore, exercise caution when selecting a region.
DB Instance Name	Must start with a letter and consist of 4 to 64 characters. Only letters, digits, hyphens (-), and underscores (_) are allowed. <ul style="list-style-type: none"> If you intend to create multiple DB instances and read replicas, the length of each DB name will change. If you create multiple DB instances at a time, they will be named with four digits appended to the DB instance name. For example, if you enter instance, the first instance will be named as instance-0001, the second as instance-0002, and so on.
DB Engine	Set to Microsoft SQL Server .

Parameter	Description
DB Engine Version	<p>For details, see DB Engines and Versions.</p> <p>Different DB engine versions are supported in different regions.</p> <p>If you use a Microsoft SQL Server database, select a proper DB engine version based on service requirements. You are advised to select the latest available version because it is more stable, reliable, and secure.</p>
DB Instance Type	<ul style="list-style-type: none"> <p>• Primary/Standby: uses the HA architecture with a primary DB instance and a synchronous standby DB instance. It is suitable for production databases of large- and medium-sized enterprises in Internet, Internet of Things (IoT), retail e-commerce sales, logistics, gaming, and other sectors. The standby DB instance improves instance reliability and is invisible to you after being created.</p> <p>An AZ is a physical region where resources use independent power supply and networks. AZs are physically isolated but interconnected through an internal network. Some regions support both single AZs and multiple AZs and some only support single AZs.</p> <p>To achieve higher reliability, RDS will automatically deploy your primary and standby instances in different physical servers even if you deploy primary/standby DB instances in the same AZ. If you attempt to create primary/standby DB instances in the same AZ in a Dedicated Computing Cluster (DCC) and there is only one physical server available, the creation will fail.</p> <p>RDS supports deploying primary and standby DB instances in an AZ or across AZs. You can determine whether the standby AZ is the same as the primary AZ.</p> <ul style="list-style-type: none"> - If they are the same (default setting), the primary and standby DB instances are deployed in the same AZ. - If they are different, the primary and standby DB instances are deployed in different AZs to ensure failover support and high availability. <p>• Single: uses the single-node architecture, which is more cost-effective than mainstream primary/standby DB instances. It is suitable for developing and testing of microsites, and small- and medium-sized enterprises, or for learning about RDS.</p>

Parameter	Description
Storage Type	<p>Determines the DB instance read/write speed. The higher the maximum throughput is, the higher the DB instance read/write speed can be.</p> <ul style="list-style-type: none"> • Ultra-high I/O: supports a maximum throughput of 350 MB/s. <p>NOTE If you select DSS for Resource Type, only the storage type that you have selected when buying the DSS service is displayed by default.</p>
Time Zone	<p>Select your time zone when you are creating a DB instance. After the DB instance is created, the time zone cannot be modified. For details, see Table 3-22.</p>
Server Collation	<p>Defines a collation of a database or table column, or a collation cast operation when applied to character string expression. It acts as the default collation for the DB instance.</p>

Table 3-22 Mapping between time zones and UTC offsets

Time Zone	Standard Time Offset	Remarks
Afghanistan Standard Time	UTC+04:30	Kabul
Alaskan Standard Time	UTC-09:00	Alaska
Arabian Standard Time	UTC+04:00	Abu Dhabi, Muscat
Atlantic Standard Time	UTC-04:00	Atlantic Time (Canada)
AUS Central Standard Time	UTC+09:30	Darwin
AUS Eastern Standard Time	UTC+10:00	Canberra, Melbourne, Sydney
Belarus Standard Time	UTC+03:00	Minsk
Canada Central Standard Time	UTC-06:00	Saskatchewan
Cape Verde Standard Time	UTC-01:00	Cape Verde Is.
Gen. Australia Standard Time	UTC+09:30	Adelaide
Central America Standard Time	UTC-06:00	Central America

Time Zone	Standard Time Offset	Remarks
Central Asia Standard Time	UTC+06:00	Astana
Central Brazilian Standard Time	UTC-04:00	Cuiaba
Central European Standard Time	UTC+01:00	Belgrade, Bratislava, Budapest, Ljubljana, Prague
Central European Standard Time	UTC+01:00	Sarajevo, Skopje, Warsaw, Zagreb
Central Pacific Standard Time	UTC+11:00	Solomon Islands, New Caledonia
Central Standard Time	UTC-06:00	Central Time (US and Canada)
China Standard Time	UTC+08:00	Beijing, Chongqing, Hong Kong, and Urumqi
E. Africa Standard Time	UTC+03:00	Nairobi
E. Australia Standard Time	UTC+10:00	Brisbane
E. Europe Standard Time	UTC+02:00	Chisinau
E. South America Standard Time	UTC-03:00	Brasilia
Eastern Standard Time	UTC-05:00	Eastern Time (US and Canada)
Georgian Standard Time	UTC+04:00	Tbilisi
GMT Standard Time	UTC	Dublin, Edinburgh, Lisbon, London
Greenland Standard Time	UTC-03:00	Greenland
Greenwich Standard Time	UTC	Monrovia, Reykjavik
GTB Standard Time	UTC+02:00	Athens, Bucharest
Hawaiian Standard Time	UTC-10:00	Hawaii
India Standard Time	UTC+05:30	Chennai, Kolkata, Mumbai, New Delhi
Jordan Standard Time	UTC+02:00	Amman
Korea Standard Time	UTC+09:00	Seoul

Time Zone	Standard Time Offset	Remarks
Middle East Standard Time	UTC+02:00	Beirut
Mountain Standard Time	UTC-07:00	Mountain Time (US and Canada)
US Mountain Standard Time	UTC-07:00	Arizona
New Zealand Standard Time	UTC+12:00	Auckland, Wellington
Newfoundland Standard Time	UTC-03:30	Newfoundland
Pacific SA Standard Time	UTC-03:00	Santiago
Pacific Standard Time	UTC-08:00	Pacific Time (US and Canada)
Russian Standard Time	UTC+03:00	Moscow/St. Petersburg
SA Pacific Standard Time	UTC-05:00	Bogota, Lima, Quito, Rio Branco
SE Asia Standard Time	UTC+07:00	Bangkok, Hanoi, Jakarta
China Standard Time	UTC+08:00	Kuala Lumpur, Singapore
Tokyo Standard Time	UTC+09:00	Osaka, Sapporo, Tokyo
US Eastern Standard Time	UTC-05:00	Indiana (East)
UTC	UTC	Coordinated Universal Time
UTC-02	UTC-02:00	Coordinated Universal Time-02
UTC-08	UTC-08:00	Coordinated Universal Time-08
UTC-09	UTC-09:00	Coordinated Universal Time-09
UTC-11	UTC-11:00	Coordinated Universal Time-11
UTC+12	UTC+12:00	Coordinated Universal Time+12
W. Australia Standard Time	UTC+08:00	Perth
W. Central Africa Standard Time	UTC+01:00	West Central Africa

Time Zone	Standard Time Offset	Remarks
W. Europe Standard Time	UTC+01:00	Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna

Figure 3-20 DB instance specifications

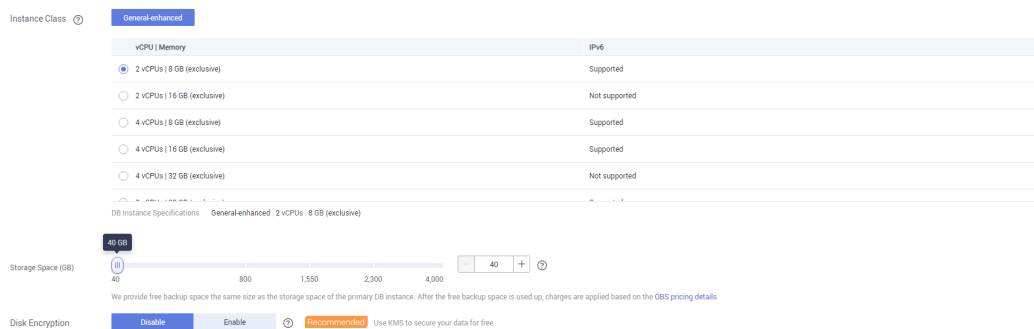


Table 3-23 Instance specifications

Parameter	Description
Instance Class	<p>Refers to the CPU and memory of a DB instance. Different instance classes have different numbers of database connections and different maximum IOPS.</p> <p>For details about instance classes, see DB Instance Classes.</p> <p>RDS DB instances have the following specifications:</p> <ul style="list-style-type: none"> • General: The allocated memory and I/O resources are exclusive. The vCPUs and storage space are shared by general DB instances on the same physical server. Storage size is not bound to vCPUs and memory and can be flexibly configured. In this way, the utilization rate is maximized and cost effectiveness is improved. The shared specifications are suitable for users who have a small budget and have low requirements on performance stability. • Exclusive: The vCPUs, memory, storage space, and I/O resources are exclusive. The performance is stable and is not affected by other DB instances on the same physical server. The premium configuration is that a DB instance exclusively occupies all resources of a physical server. The exclusive specifications are suitable for database-centered scenarios such as finance, e-commerce, government, and large- and medium-scale Internet business. <p>After a DB instance is created, you can change its CPU and memory. For details, see Changing a DB Instance Class.</p> <p>NOTE DB instances in a DCC only support the general-enhanced instance class.</p>
Resource Type	<ul style="list-style-type: none"> • EVS • DSS <p>NOTE This option is displayed only when you buy the DSS service.</p>
Storage Pool	<p>Displayed only when you select DSS for Resource Type. The storage pool is secure because it is physically isolated from other pools.</p>
Storage Space (GB)	<p>Contains the file system overhead required for inode, reserved block, and database operation. Can range in size from 40 GB to 4,000 GB and can be scaled up only by a multiple of 10 GB.</p> <p>After a DB instance is created, you can scale up its storage space. For details, see Scaling Up Storage Space.</p>

Parameter	Description
Disk Encryption	<ul style="list-style-type: none"> • Disabled: indicates the encryption function is disabled. • Enabled: indicates the encryption function is enabled, improving data security but affecting system performance. Key Name: indicates the tenant key. You can create or select a key. <p>NOTE</p> <ul style="list-style-type: none"> - Once the DB instance is created, you cannot modify the disk encryption status or change the key. The backup data stored in OBS is not encrypted. - After an RDS DB instance is created, do not disable or delete the key that is being used. Otherwise, RDS will be unavailable and data cannot be restored. - For details about how to create a key, see the "Creating a CMK" section in the <i>Data Encryption Workshop User Guide</i>.

Table 3-24 Database Security Service

Parameter	Description
DBSS	<p>Prevents database attacks, ensuring database security on the cloud.</p> <ul style="list-style-type: none"> • After you subscribe to Database Security Service (DBSS), you cannot buy DB instances in patches. • Only DB instances of certain specifications support the purchase of RDS and DBSS together. • The DBSS administrator is admin, and the password is the same as that of the RDS root user. • After you subscribe to DBSS, log in to the DBSS console, associate an EIP with the DBSS instance and configure security protection.

Figure 3-21 Network and database configuration

The screenshot shows the configuration page for an RDS instance. It includes sections for VPC (vpc-02, subnet-02192.168.2.0/24), Security Group (Sys-default), Password (Administrator: rduser), Parameter Template (Default-Microsoft SQL Server-2017_EE), Enterprise Project (default), Tag, Required Duration (1 year), and Quantity (1).

Table 3-25 Network

Parameter	Description
VPC	<p>A dedicated virtual network in which your RDS DB instances are located. A VPC can isolate networks for different services. You can select an existing VPC or create a VPC. For details on how to create a VPC, see the "Creating a VPC" section in the <i>Virtual Private Cloud User Guide</i>.</p> <p>If no VPC is available, RDS allocates a VPC to you by default.</p> <p>NOTICE After the DB instance is created, the VPC cannot be changed.</p>
Subnet	<p>Improves network security by providing dedicated network resources that are logically isolated from other networks. Subnets take effect only within an AZ. The Dynamic Host Configuration Protocol (DHCP) function is enabled by default for subnets in which you plan to create RDS DB instances and cannot be disabled.</p> <p>A floating IP address is automatically assigned when you create a DB instance. You can also enter an unused floating IP address in the subnet CIDR block. After the DB instance is created, you can change the floating IP address.</p>
Security Group	<p>Enhances security by controlling access to RDS from other services. You need to add rules to a security group so that you can connect to your DB instance.</p> <p>If no security group is available, RDS allocates a security group to you by default.</p> <p>NOTE To configure the Active Directory (AD) domain for the DB instance, ensure that the DB instance and domain controller must be in the same security group.</p>

Table 3-26 Database configuration

Parameter	Description
Password	<ul style="list-style-type: none"> • Configure (default value): Configure the password when you are creating the DB instance. • Skip: The system does not set an initial password for you. <p>NOTICE To log in, you will have to reset a password for the DB instance. After a DB instance is created, you can reset the password. For details, see Resetting the Administrator Password.</p>
Administrator	The default login name for the database is rdsuser .
Administrator Password	<p>Must consist of 8 to 32 characters and contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters (~!@#%\$%^*_+?,.). Enter a strong password. Periodically change it to improve security and prevent security risks such as brute force cracking.</p> <p>Keep this password secure. The system cannot retrieve it.</p> <p>After a DB instance is created, you can reset this password. For details, see Resetting the Administrator Password.</p>
Confirm Password	Must be the same as Administrator Password .
Parameter Template	<p>Contains engine configuration values that can be applied to one or more DB instances. If you intend to create primary/standby DB instances, they use the same parameter template. You can modify instance parameters as required after the DB instance is created.</p> <p>NOTICE If you use a custom parameter template when creating a DB instance, the specification-related parameter max server memory (MB) in the custom template is not delivered. Instead, the default value is used.</p> <p>You can modify the instance parameters as required after the DB instance is created. For details, see section Modifying Parameters in a Parameter Template.</p>
Enterprise Project	<p>If the DB instance has been associated with an enterprise project, select the target project from the Enterprise Project drop-down list.</p> <p>You can also go to the ProjectMan console to create a project. For details about how to create a project, see the <i>ProjectMan User Guide</i>.</p>

Table 3-27 AD domain

Parameter	Description
AD Domain	<p>Allows an Active Directory user to authenticate with Microsoft SQL Server DB instances.</p> <p>Active Directory, which is short for AD, is a directory service on Windows Standard Server, Windows Enterprise Server, and Windows Datacenter Server. Active Directory stores information about objects on the network and makes this information easy for administrators and users to find and use. Active Directory uses a structured data store as the basis for a logical, hierarchical organization of directory information.</p> <p>NOTICE</p> <ol style="list-style-type: none"> 1. When you configure an AD domain information during the DB instance creation, do not configure or disable Group Policy Object (GPO) for your domain controller server. Otherwise, the DB instance creation will fail. 2. If GPO is required, you need to buy an ECS and set up a new domain controller server with GPO disabled. Then, establish trust between your domain controller server and the new domain controller server. For details, contact customer service. 3. The domain controller server time must be synchronized to an NTP server. Non-standard time or too large time difference may cause DB instance creation failures. <ul style="list-style-type: none"> • Skip: This option is selected by default. • Configure: To configure the AD domain, you must first prepare a domain controller on an ECS or on-premises database. Then, configure the directory address, domain name, directory administrator, and directory administrator password as required. <p>NOTE</p> <p>If a Microsoft SQL Server single DB instance is configured with the AD domain, it cannot be changed to primary/standby DB instances.</p> <p>DB instances of Microsoft SQL Server 2017 Enterprise Edition, 2017 Standard Edition, and 2017 Web Edition do not support AD domain configuration.</p>
Directory Address	<p>Enter the private IP address of the ECS that supports the AD domain. After the DB instance is created, you can view the directory address in the DB Information area on the Basic Information page.</p> <p>Example value: 192.168.x.x.</p>

Parameter	Description
Domain Name	A fully qualified domain name, such as DBStest.com, must: <ol style="list-style-type: none"> 1. Be the same as the ECS domain name. 2. Be no more than 48 characters long. 3. Only include letters, digits, dots (.), and hyphens (-). 4. Include a valid top-level domain name which contains at least 2 characters long and contains only dots (.) and letters, for example, .com 5. After the DB instance is created, you can view the directory address in the DB Information area on the Basic Information page.
Directory Administrator	You are advised to enter the domain administrator username.
Directory Administrator Password	Indicates the password of the directory administrator. Keep this password secure. The system cannot retrieve it.

Table 3-28 Tags

Parameter	Description
Tag	Tags an RDS DB instance. This configuration is optional. Adding tags to RDS DB instances helps you better identify and manage the DB instances. A maximum of 10 tags can be added for each DB instance. After a DB instance is created, you can view its tag details on the Tags page. For detailed operations, see Managing Tags .

Table 3-29 Purchase period


Parameter	Description
Required Duration	This option is available only for yearly/monthly DB instances. The system will automatically calculate the configuration fee based on the selected required duration. The longer the required duration is, the larger discount you will enjoy.
Auto-renew	<ul style="list-style-type: none"> • This option is available only for yearly/monthly DB instances and is not selected by default. • If you select this option, the auto-renew cycle is determined by the selected required duration.

Step 8 Select a payment method and complete the payment.

 **NOTE**

This operation applies only to the yearly/monthly billing mode.

Step 9 To view and manage the DB instance, go to the **Instance Management** page.

- During the creation process, the DB instance status is **Creating**.
- To refresh the DB instance list, click  in the upper right corner of the list. When the creation process is complete, the instance status will change to **Available**.
- The automated backup policy is enabled by default. An automated full backup is immediately triggered after a DB instance is created.
- After a DB instance is created, you can enter a description for it.
- The default database port number is **1433**. After a DB instance is created, you can change its port number.

 **NOTE**

You are advised to change the database port in a timely manner.
For details, see [Changing the Database Port](#).

----End

Related Operations

[Creating a DB Instance Using an API](#)

3.4.3 Step 2: Bind an EIP

Scenarios

You can bind an EIP to the DB instance for public access and can unbind the EIP from the DB instance as required.

Precautions

- You need to configure security groups and enable specific IP addresses and ports to access the target DB instance. Before accessing the DB instance, you need to add an individual IP address or an IP address range that will access the DB instance to the inbound rule. For details, see section [Step 3: Configure Security Group Rules](#).
- You can buy an EIP on the VPC console and bind it to a DB instance. For pricing details, see [Elastic IP pricing details](#).

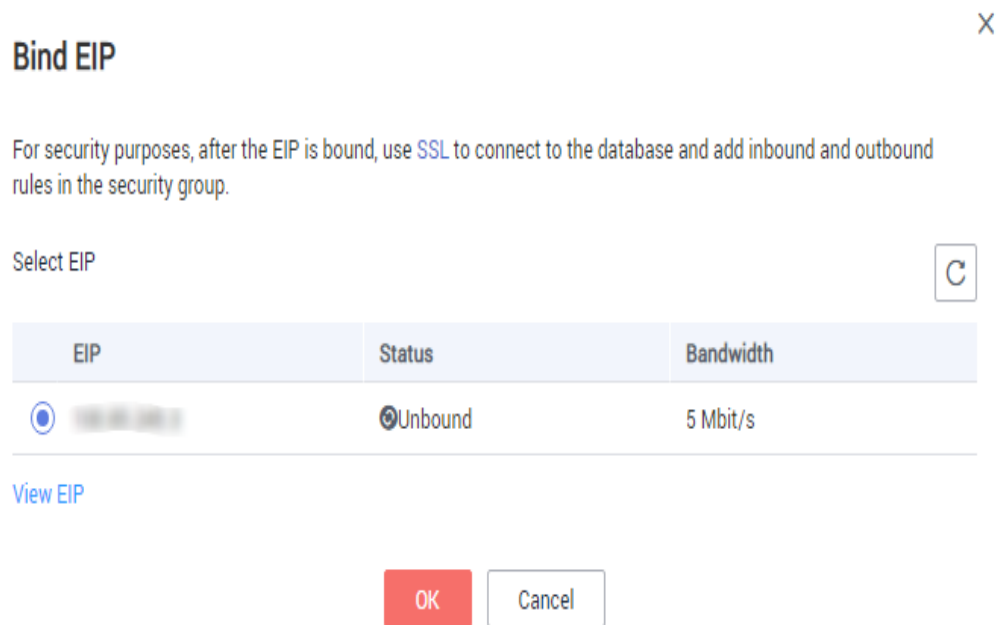
Binding an EIP

Step 1 On the **Instance Management** page, click the target DB instance.

Step 2 In the navigation pane on the left, choose **EIPs**. On the displayed page, click **Bind EIP**.

- Step 3** In the displayed dialog box, select an EIP and click **OK**.
If no available EIPs are displayed, click **View EIP** and obtain an EIP.

Figure 3-24 Selecting an EIP



- Step 4** On the **EIPs** page of the RDS console, view the EIP that has been bound to the DB instance.

You can also view the progress and result of binding an EIP to a DB instance on the **Task Center** page.

----End

3.4.4 Step 3: Configure Security Group Rules

Scenarios

A security group is a collection of access control rules for ECSs and RDS DB instances that have the same security protection requirements and are mutually trusted in a VPC.

This section describes how to create a security group to enable specific IP addresses and ports to access RDS.

When you attempt to connect to an RDS DB instance through an EIP, you need to configure an **inbound rule** for the security group associated with the DB instance.

Precautions

The default security group rule allows all outgoing data packets. ECSs and RDS DB instances can access each other if they are deployed in the same security group.

After a security group is created, you can configure security group rules to control access from and to the DB instances in the security group.

- By default, you can create a maximum of 500 security group rules.
- Too many security group rules will increase the first packet latency. You are advised to create a maximum of 50 rules for each security group.
- To access an RDS DB instance from resources outside the security group, you need to configure an **inbound rule** for the security group associated with the RDS DB instance.

 **NOTE**

To ensure security of data and DB instances, you are advised to use the principle of least privilege for database access. Change the database port (default value: **3306**), and set the IP address to the remote server's address or any IP address in the remote server's smallest subnet to control the access scope of the remote server.

If you use **0.0.0.0/0**, you enable all IP addresses to access RDS DB instances in the security group.

For details about the requirements of security group rules, see the [Adding a Security Group Rule](#) section in the *Virtual Private Cloud User Guide*.

Procedure

Step 1 Log in to the management console.

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

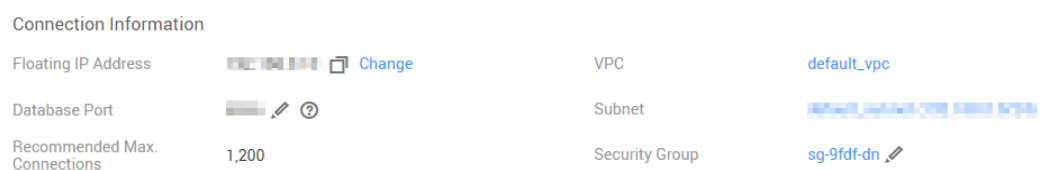
Step 3 Click **Service List**. Under **Database**, click **Relational Database Service**. The RDS console is displayed.

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

Step 5 Configure security group rules.

In the **Connection Information** area, click the security group.

Figure 3-25 Connection information



Step 6 On the inbound rule tab, click **Add Rule**. In the displayed dialog box, set required parameters to add an inbound rule.

You can click **+** to add more inbound rules.

Figure 3-26 Adding an inbound rule

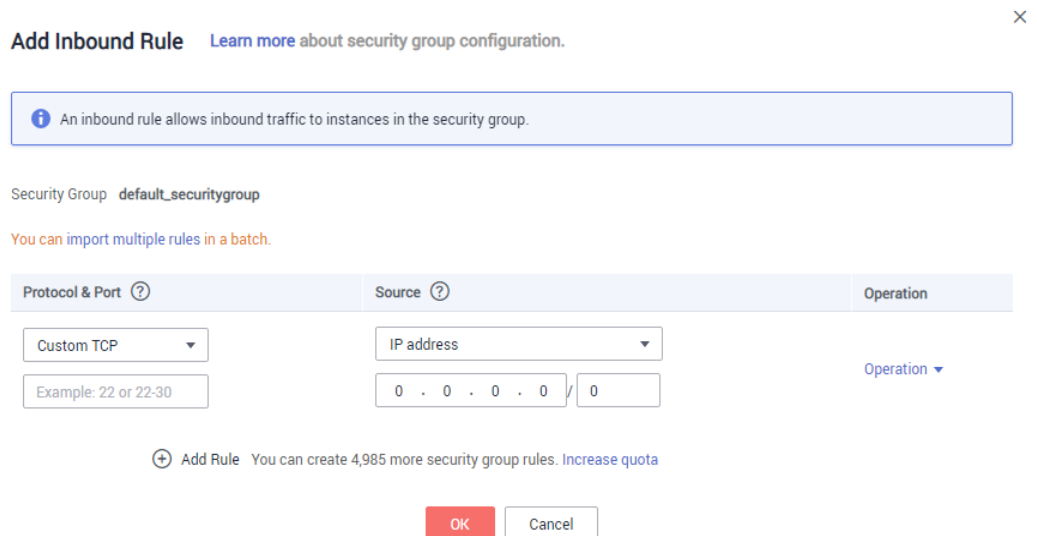


Table 3-30 Inbound rule parameter description

Parameter	Description	Example Value
Protocol & Port	Specifies the network protocol. Currently, the value can be All , TCP , UDP , ICMP , GRE , or others.	Custom TCP
	Port: specifies the port or port range over which the traffic can reach your ECS. Common ports are listed in Common Ports Used by ECSs .	When connecting to the DB instance through a public network, enter the port of the target DB instance.
Source	Specifies the source of the security group rule. The value can be another security group or a single IP address. For example: <ul style="list-style-type: none"> • xxx.xxx.xxx.xxx/32 (IPv4 address) • xxx.xxx.xxx.0/24 (subnet) • 0.0.0.0/0 (any IP address) 	0.0.0.0/0
Description	Provides supplementary information about the security group rule. This parameter is optional. The description can contain a maximum of 255 characters and cannot contain angle brackets (<) or (>).	-

----End

3.4.5 Step 4: Connect to a DB Instance Through a Public Network

You can connect to a DB instance through a common connection or an SSL connection. The SSL connection encrypts data and is more secure.

Preparations

1. Install the SQL Server client.
For details, see [How Can I Install SQL Server Management Studio?](#)
2. Bind an EIP to the target DB instance and configure security group rules.
 - a. Bind an EIP to the target DB instance.
For details about how to bind an EIP, see section [Step 2: Bind an EIP](#).
 - b. Obtain the IP address of the local device.
 - c. Configure security group rules.
Add the IP address and port obtained in [2.b](#) to the inbound rule of the security group.
For details about how to configure a security group rule, see section [Step 3: Configure Security Group Rules](#).
 - d. Run the **ping** command to connect the EIP that has been bound to the target DB instance in [2.a](#) to check that the local device can connect to the EIP.

Common Connection

Step 1 Start SQL Server Management Studio.

Step 2 Choose **Connect > Database Engine**. In the displayed dialog box, enter login information.

Figure 3-27 Connecting to the server



- **Server name:** indicates the IP address and port of the DB instance. Use a comma (,) to separate them. For example: x.x.x.x,8080.
 - The IP address is the EIP that has been bound to the DB instance.
 - The port is the database port in the **Connection Information** area on the **Basic Information** page of the DB instance.
- **Authentication:** indicates the authentication mode. Select **SQL Server Authentication**.
- **Login:** indicates the RDS database username. The default administrator is **rdsuser**.
- **Password:** indicates the password of the RDS database username.

Step 3 Click **Connect** to connect to the DB instance.


 **NOTE**

If the connection fails, ensure that preparations have been correctly made in [Preparations](#) and try again.

----End

SSL Connection

Step 1 Download the SSL root certificate and then upload it.

1. In the **DB Information** area on the **Basic Information** page, click  in the **SSL** field to download the root certificate or certificate bundle.
2. Upload the root certificate to the ECS to be connected to the DB instance.
3. Import the root certificate into Windows OS on the ECS. For details, see [How Can I Import the Root Certificate to the Windows OS?](#)

Step 2 Start SQL Server Management Studio.

Step 3 Choose **Connect > Database Engine**. In the displayed dialog box, enter login information.

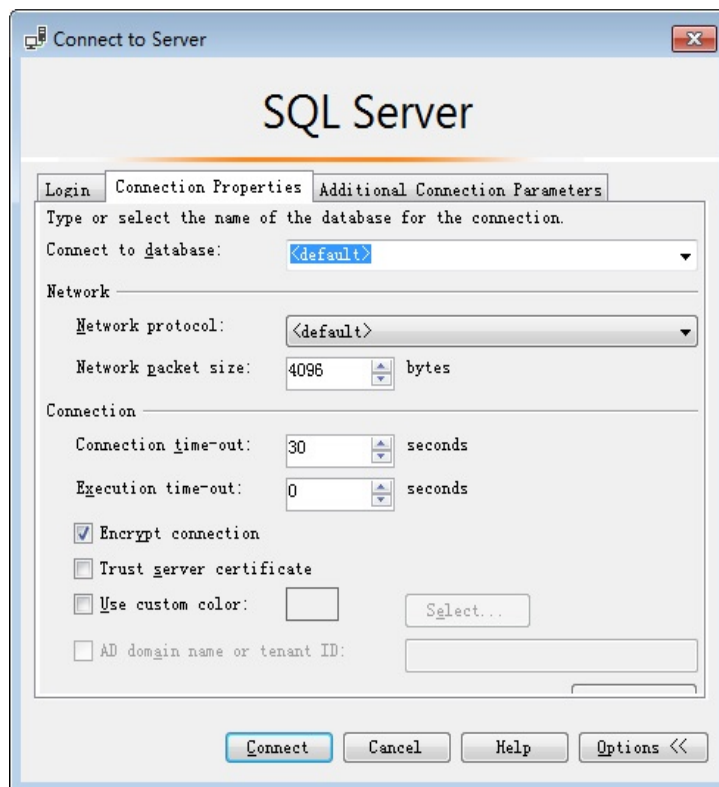
Figure 3-28 Connecting to the server



- **Server name:** indicates the IP address and port of the DB instance. Use a comma (,) to separate them. For example: x.x.x.x,8080.
 - The IP address is the EIP that has been bound to the DB instance.
 - The port is the database port in the **Connection Information** area on the **Basic Information** page of the DB instance.
- **Authentication:** indicates the authentication mode. Select **SQL Server Authentication**.
- **Login:** indicates the RDS database username. The default administrator is **rdsuser**.
- **Password:** indicates the password of the RDS database username.

Step 4 On the **Connection Properties** page, enter related parameters and select **Encrypt connection** to enable SSL encryption. (By default, **Encrypt connection** is not selected. You need to select it manually.)

Figure 3-29 Connection properties



Step 5 Click **Connect** to connect to the DB instance.

NOTE

If the connection fails, ensure that preparations have been correctly made in [Preparations](#) and try again.

----End

FAQs

[What Should I Do If I Fail to Connect to an RDS DB Instance?](#)

Follow-up Operations

After logging in to the DB instance, you can create or migrate databases.

- [Creating a Microsoft SQL Server Database Using an API](#)
- [Managing Microsoft SQL Server Databases Using DAS](#)
- [Migrating Microsoft SQL Server Databases Using DRS](#)

A Change History

Released On	Description
2020-11-11	<p>This issue is the eighteenth official release, which incorporates the following change:</p> <p>Supported the selection of your local time zone for Microsoft SQL Server DB instances.</p>
2020-02-05	<p>This issue is the seventeenth official release, which incorporates the following change:</p> <p>Added prompts for DB instance types during the DB instance purchase.</p>
2019-12-30	<p>This issue is the sixteenth official release, which incorporates the following changes:</p> <ul style="list-style-type: none"> • Supported password setting after a DB instance is created.
2019-10-12	<p>This issue is the fourteenth official release, which incorporates the following changes:</p> <ul style="list-style-type: none"> • Optimized the constraints on the AD domain name. • Adjusted the getting started structure. • Optimized the description of binding and unbind EIPs.
2019-08-12	<p>This issue is the thirteenth official release, which incorporates the following changes:</p> <ul style="list-style-type: none"> • Optimized the password policy of purchasing DB instances. • Supported database proxy for MySQL DB instances.

Released On	Description
2019-07-12	<p>This issue is the twelfth official release, which incorporates the following changes:</p> <ul style="list-style-type: none"> ● Supported batch creation of read replicas for MySQL DB instances. ● Supported a maximum of 10 read replicas for each MySQL primary DB instance. ● Added the root user permissions for MySQL DB instances.
2019-06-12	<p>This issue is the eleventh official release, which incorporates the following changes:</p> <ul style="list-style-type: none"> ● Supported batch creation of read replicas during the DB instance creation. ● Supported access to MySQL DB instances through private domain names.
2019-02-15	<p>This issue is the tenth official release, which incorporates the following changes:</p> <ul style="list-style-type: none"> ● Supported adding EIPs to the whitelist for Microsoft SQL Server. ● Supported downloading incremental backups for PostgreSQL DB instances. ● Optimized the descriptions of connecting to MySQL, PostgreSQL, and Microsoft SQL Server DB instances.
2018-11-20	<p>This issue is the ninth official release, which incorporates the following changes:</p> <ul style="list-style-type: none"> ● Supported PostgreSQL Enhanced Edition. ● Supported creating read replicas for Microsoft SQL Server DB instances. ● Supported specifying a VIP when you create a Microsoft SQL Server DB instance. ● Supported I3 specifications for PostgreSQL.
2018-09-04	<p>This issue is the eighth official release, which incorporates the following changes:</p> <ul style="list-style-type: none"> ● Optimized EIP mechanism for MySQL, PostgreSQL, and Microsoft SQL Server. ● Supported I3 specifications for PostgreSQL DB instances.

Released On	Description
2018-08-15	<p>This issue is the seventh official release, which incorporates the following changes:</p> <ul style="list-style-type: none"> ● Supported multi-project management. ● Supported I3 specifications for MySQL DB instances. ● Added the DAS login function on the RDS console.
2018-08-03	<p>This issue is the sixth official release, which incorporates the following changes:</p> <p>Supporting buying RDS DB instances and DBSS together.</p> <p>Supported creating yearly/monthly read replicas for MySQL and PostgreSQL DB instances.</p>
2018-07-13	<p>This issue is the fifth official release, which incorporates the following changes:</p> <ul style="list-style-type: none"> ● Supported SQL Server 2016 Web. ● Supported SQL Server 2014 SP2 Web. ● Supported SQL Server 2008 R2 SP3 Web. ● Supported creating DR instances for MySQL DB instances. ● Changed the default port number to 5432 when a PostgreSQL DB instance is created.

Released On	Description
2018-06-30	<p>This issue is the fourth official release, which incorporates the following changes:</p> <ul style="list-style-type: none"> ● If your account balance is greater than or equal to ¥0, your operations are not restricted. ● Supported the configuration and change of the floating IP address for a MySQL DB instance. ● Supported enabling and disabling public accessibility for MySQL read replicas. ● Supported storage space scaling of MySQL and PostgreSQL DB instances numerous times. Each scaling must be a multiple of 10 GB. ● Supported storage space scaling of SQL Server DB instances by a multiple of 10 GB. ● Supported downloading backup data of a specific database for Microsoft SQL Server.
2018-06-15	<p>This issue is the third official release, which incorporates the following changes:</p> <ul style="list-style-type: none"> ● Supported auto renewal during the creation of yearly/monthly DB instances. ● Increased the backup retention period to 732 days. ● Displayed the maximum number of connections for MySQL and PostgreSQL DB instances. ● Supported time zone selections when creating a MySQL DB instance. ● Supported 1 vCPU 2 GB and 1 vCPU 4 GB instance classes for PostgreSQL DB instances.

Released On	Description
2018-06-01	<p>This issue is the second official release, which incorporates the following changes:</p> <ul style="list-style-type: none"> ● Supported working with the DSS service. ● Supported a maximum of 4,000 GB of storage space when you create or scale up a DB instance. ● Supported parameter group selections during DB instance creation. ● Supported creating yearly/monthly DB instances in batches. ● Supported enabling and disabling public accessibility for MySQL DB instances. ● Changed the default port number to 3306 when a MySQL DB instance is created. ● Supported display of progress and logs of creating or scaling MySQL DB instances in the task center. ● Supported PostgreSQL 10. ● Supported Microsoft SQL Server 2008 R2 SP3 Enterprise Edition.
2018-05-15	This issue is the first official release.