Alibaba Cloud ApsaraDB for MySQL

Quick Start for SQL Server

Issue: 20190813

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Generic conventions

Table -1: Style conventions

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

Style	Description	Example
{} or {a|b}	It indicates that it is a required value, and only one item can be selected.	`swich {stand | slave}`

Contents

1 Limits

To guarantee instance stability and security, RDS for SQL Server has certain limits.

Function	Cluster (AlawayOn) Edition	High-Availibility Edition		Basic Edition
	2017 Enterprise	2016 Standard/ Enterprise 2012 Standard/ Enterprise	2008 R2 Enterprise	2016 Web 2012 Web/ Enterprise
Maximum number of databases(Note)	50	50	50	100
Maximum number of database accounts	Unlimited	Unlimited	500	Unlimited
Create user , LOGIN, or database	Supported	Supported	Supported	Supported
Database-level DDL trigger	Supported	Supported	Not supported	Supported
Database permission authorization	Supported	Supported	Not supported	Supported
KILL permission	Supported	Supported	Supported	Supported
LinkServer	Supported	Supported	Not supported	Not supported
Distributed transaction	Supported	Supported	Not supported	Not supported
SQL Profiler	Supported	Supported	Supported	Supported
Tuning Advisor	Supported	Supported	Not supported	Supported
Change Data Capture (CDC)	Supported	Supported	Not supported	Supported

Function	Cluster (AlawayOn) Edition	High-Availibility Edition		Basic Edition
	2017 Enterprise	2016 Standard/ Enterprise 2012 Standard/ Enterprise	2008 R2 Enterprise	2016 Web 2012 Web/ Enterprise
Chage Tracking	Supported	Supported	Supported	Supported
Windows domain account login	Not supported	Not supported	Not supported	Not supported
Email				
SQL Server Integration Services (SSIS)				
SQL Server Analysis Services (SSAS)				
SQL Server Reporting Services (SSRS)				
R Services				
Common Language Runtime (CLR)				
Asynchronous communication				
Replication				
Policy management				

Note:

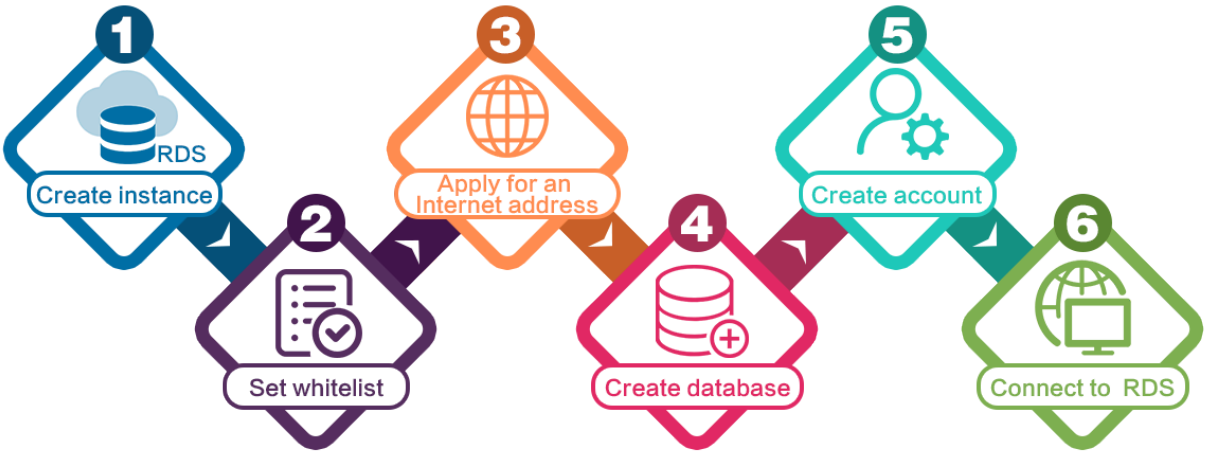
- RDS for SQL Server instances already have Microsoft SQL Server licenses and do not support your own licenses.

- For SQL Server 2012/2016/2017, you can submit a ticket to apply for increasing the higher maximum number of databases.

2 General process

This Quick Start describes the procedure from purchasing an RDS instance to using it.

Quick Start flowchart



1. Create an RDS for SQL Server instance
2. Configure a whitelist
3. Apply for an Internet address
4. · Create databases and accounts for an RDS for SQL Server 2017 instance
   · Create databases and accounts for an RDS for SQL Server 2012 or 2016 instance
   · Create databases and accounts for an RDS for SQL Server 2008 R2 instance
5. Connect to an RDS for SQL Server instance

3 Create an RDS for SQL Server instance

You can use the RDS console or APIs to create an RDS instance. For more information about instance pricing, see Pricing of ApsaraDB for RDS. This topic describes how to use the RDS console to create an RDS for SQL Server instance. For more information about how to use APIs to create an RDS for SQL Server instance, see CreateDBInstance.

Prerequisites

You have registered an Alibaba Cloud account. For more information, see Sign up with Alibaba Cloud.

Precautions

- Subscription instances cannot be converted to Pay-As-You-Go instances.
- Pay-As-You-Go instances can be converted to Subscription instances. For operation instructions, see Change the billing method.
- An Alibaba Cloud account can create up to 30 Pay-As-You-Go RDS instances. You can open a ticket to apply for increasing the limit.

Procedure

1. Log on to the RDS console.
2. On the Instances page, click Create Instance.
3. Select a billing method:
   - Pay-As-You-Go: indicates post payment (billed by hour). For short-term requirements, create Pay-As-You-Go instances because they can be released at any time to save costs.
   - Subscription: indicates prepayment. You need to pay when creating an instance. For long-term requirements, create Subscription instances because they are more cost-effective. Furthermore, the longer the subscription, the higher the discount.

4. Set the following parameters.

Parameter	Description
Region	Indicates the location of the RDS instance you want to purchase. You cannot change the region once you confirm your order. · Select the region closest to your users to increase the access speed. · Select the region where your ECS instance is located so that the ECS instance can access the RDS instance through the intranet. If the ECS instance and RDS instance are located in different regions, they can communicate only through the Internet and hence performance is degraded.
Database Engine	The supported database engines are MySQL, Microsoft SQL Server, PostgreSQL, PPAS (compatible with Oracle), and MariaDB TX. In this example, select Microsoft SQL Server. Note: The available database engines vary depending on the region you select.
Version	For RDS for SQL Server, the supported versions are SQL Server 2017, 2016, 2012, and 2008 R2. For more information, see Functions supported by different editions of SQL Server. Note: The available versions vary depending on the region you select.

Parameter	Description
Edition	· Basic: This edition provides a single node and separates computing from storage. It is extremely cost-effective. · High-availability: This edition adopts the high-availability architecture with one master node and one slave node. It is applicable to over 80% of scenarios. · AlwaysOn: This edition provides one master node, one slave node, and up to seven read-only nodes that horizontally scale read capabilities.  Note: The available product series vary depending on the region you select. For more information on the product series, see Product series overview.
Zone	A zone is a physical area within a region. Different zones in the same region are basically the same. You can deploy the master and slave nodes of your RDS instance in the same zone or in different zones.
Network Type	· Classic Network: indicates the traditional network. · VPC (recommended): short for Virtual Private Cloud. A VPC is an isolated network environment and therefore provides higher security and performance than the classic network.  Note: Make sure the network type of the RDS instance is the same as that of your ECS instance so that the ECS instance can access the RDS instance through the intranet.

Parameter	Description
Type	Indicates the specifications of the RDS instance. Each instance type supports a specific number of CPU cores, memory size, maximum number of connections, and maximum IOPS. For more information, see Instance type list. RDS for SQL Server supports the following instance type families: · General-purpose instance: owns dedicated memory and I/O resources, but shares CPU and storage resources with the other general-purpose instances on the same server. · Dedicated instance: owns dedicated CPU, memory, storage, and I/O resources. · Dedicated host: owns all the CPU, memory, storage, and I/O resources on the server where it is located. For example, 8 Cores 32 GB (Basic) indicates a general-purpose instance, and 8 Cores 32 GB (Dedicated) indicates a dedicated instance.
Capacity	Used for storing data, system files, binlog files, and transaction files.

5. Set the duration (only for Subscription instances) and quantity, and click Buy Now.

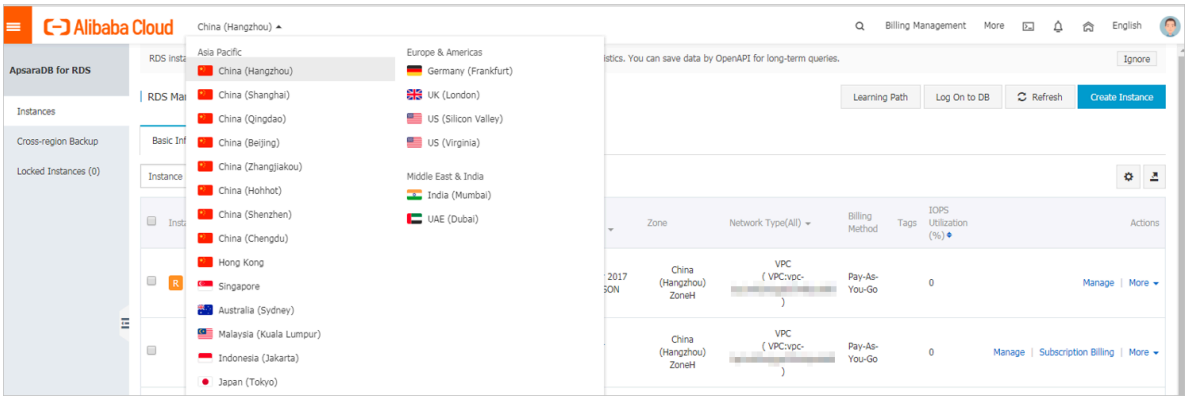
   Note:
   For a Subscription instance, you can:

   · Select Auto Renew in the Duration section. Then the system can automatically deduct fees from your account to extend the validity period of your instance. For example, if you purchase a three-month Subscription instance with Auto Renew selected, the system automatically deducts frees of three months when the instance is about to expire.
   · Click Add to Cart and then click the cart to place the order.

6. On the Order Confirmation page, review the order information, select the terms and agreements as prompted, click Pay Now, and complete the payment.

What to do next

1. In the upper left corner of the RDS console, select the region where the instance is located, and view the instance details.



2. Configure a whitelist.
3. Create accounts.
4. Apply for an Internet address (if you want to access the RDS instance through the Internet).
5. Connect to the RDS instance.

APIs

API	Description
CreateDBInstance	Used to create an RDS instance.

4 Initial configuration

4.1 Configure a whitelist

After you create an RDS instance, you must configure a whitelist to allow external devices to access the instance. The default whitelist contains only 127.0.0.1. Before you add new IP addresses to the whitelist, no devices are allowed to access the RDS instance.

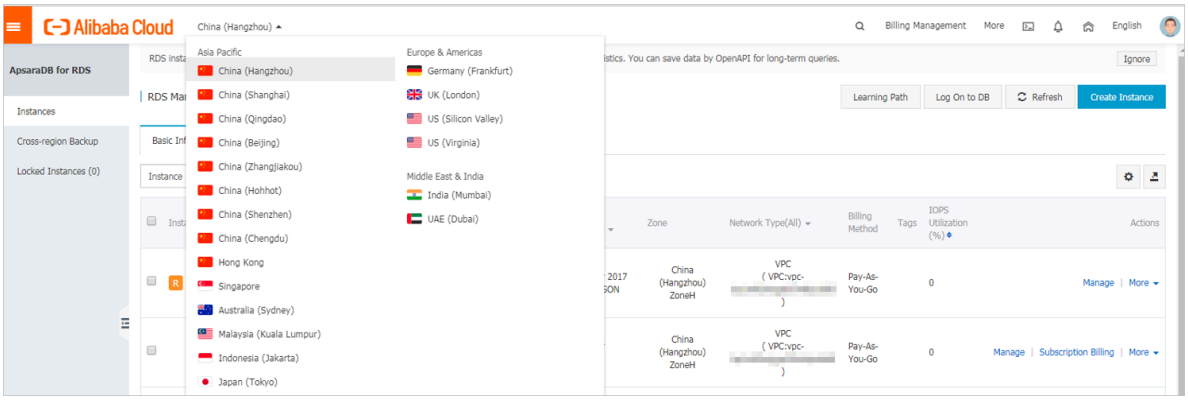
A whitelist can be used to improve the security of your RDS instance. We recommend that you update the whitelist on a regular basis. Configuring whitelists does not affect the normal operation of the RDS instance.

Precautions

- The default whitelist can only be edited or cleared. It cannot be deleted.
- If you log on to DMS but your IP address has not been added to the whitelist, DMS will prompt you to add the IP address, and will automatically generate a whitelist containing your IP address.

Procedure

1. Log on to the ApsaraDB for RDS console.
2. In the upper-left corner of the page, select the region where the instance is located.



3. Find the instance and click its ID.
4. In the left-side navigation pane, click Data Security.
5. On the Whitelist Settings tab page, click Edit corresponding to the default whitelist.

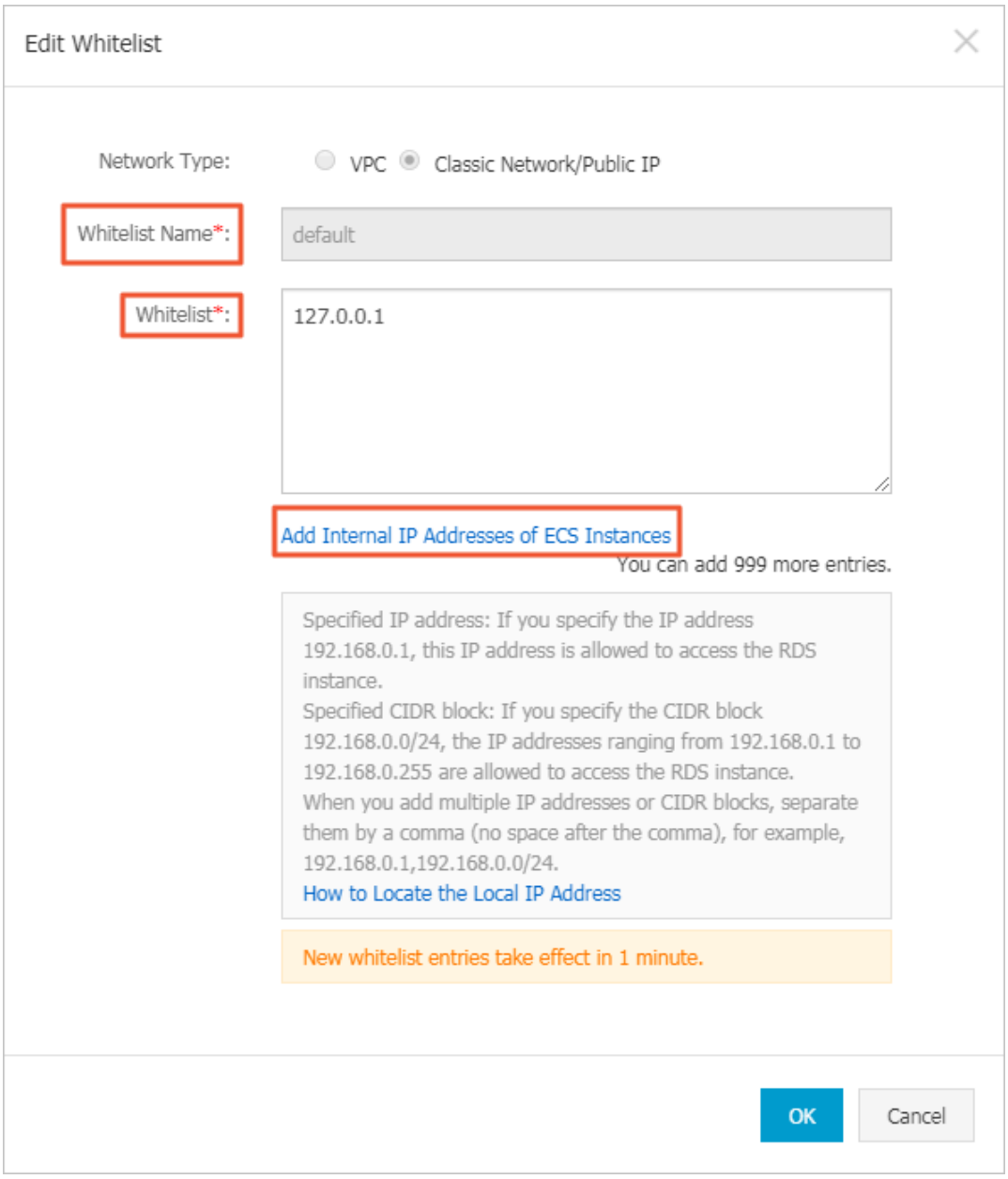
Note:

You can click Create Whitelist to create a whitelist.

6. In the displayed Edit Whitelist dialog box, specify the IP addresses or CIDR blocks used to access the instance, and then click OK.
   - If you specify the CIDR block 10.10.10.0/24, any IP addresses in the 10.10.10.*X* format are allowed to access the RDS instance.
   - To add multiple IP addresses or CIDR blocks, separate each entry with a comma (without spaces), for example, `192.168.0.1,172.16.213.9`.
   - After you click Add Internal IP Addresses of ECS Instances, the IP addresses of all the ECS instances under your Alibaba Cloud account are displayed. You can quickly add internal IP addresses to the whitelist.

Note:

After you add an IP address or CIDR block to the default whitelist, the default address 127.0.0.1 is automatically deleted.



Common errors

- The default address 127.0.0.1 in Data Security > Whitelist Settings indicates that no device is allowed to access the RDS instance. Therefore, you need to add IP addresses of devices to the whitelist to allow access to the instance.
- The IP address in the whitelist is set to 0.0.0.0, but the correct format is 0.0.0.0/0.

Note:

0.0.0.0/0 indicates that all devices are allowed to access the RDS instance. Exercise caution when using this IP address.

- The public IP address that you add to the whitelist may not be the real egress IP address. The reasons are as follows:
  - The public IP address is not fixed and may dynamically change.
  - The tools or websites used to query the public IP addresses provide wrong IP addresses.

APIs

API	Description
DescribeDBInstanceIPArrayList	Used to view the IP address whitelist of an RDS instance.
ModifySecurityIps	Used to modify the IP address whitelist of an RDS instance.

4.2 Apply for an Internet address

RDS provides two types of addresses: intranet addresses and Internet addresses.

Intranet and Internet addresses

Address Type	Description
Intranet address	The intranet address is generated by default. Use the intranet address if all of the following conditions are met: · Your application is deployed on an ECS instance. · The ECS instance is located in the same region as your RDS instance. · The ECS instance has the same network type as your RDS instance. The intranet address is recommended because accessing RDS through the intranet is most secure and delivers optimal performance.

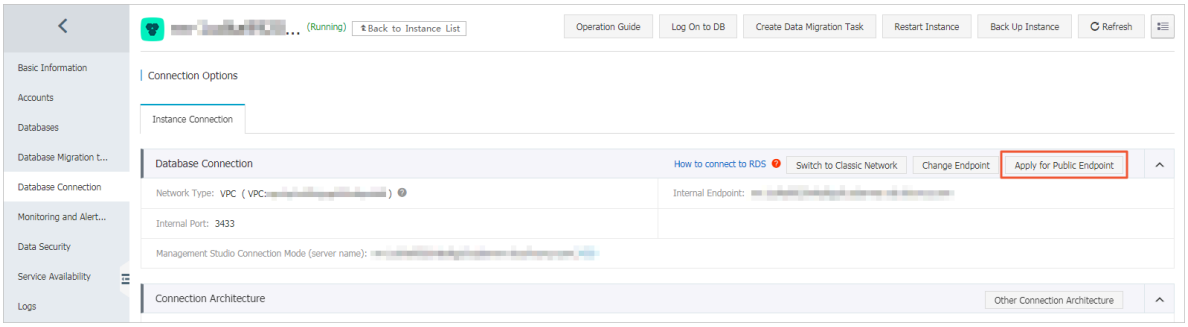
Address Type	Description
Internet address	You need to manually apply for the Internet address. You can also release it anytime. Use the Internet address if you cannot access RDS through the intranet. Specific scenarios are as follows: · An ECS instance accesses your RDS instance but the ECS instance is located in a different region or has a network type different from your RDS instance. · A server or computer outside Alibaba Cloud accesses your RDS instance. Note: · The Internet address and traffic are currently free of charge. · Using the Internet address reduces security. Please exercise caution . · To ensure high security and performance, we recommend that you migrate your application to an ECS instance that is in the same region and has the same network type as your RDS instance and then use the intranet address.

Apply for an Internet address

1. Log on to the RDS console.
2. In the upper-left corner, select the region where the RDS instance is located.

3. Find the RDS instance and click its ID.
4. In the left-side navigation pane, click Database Connection.

5. Click Apply for Public Endpoint.



6. In the displayed dialog box, click OK.

   The Internet address is generated.

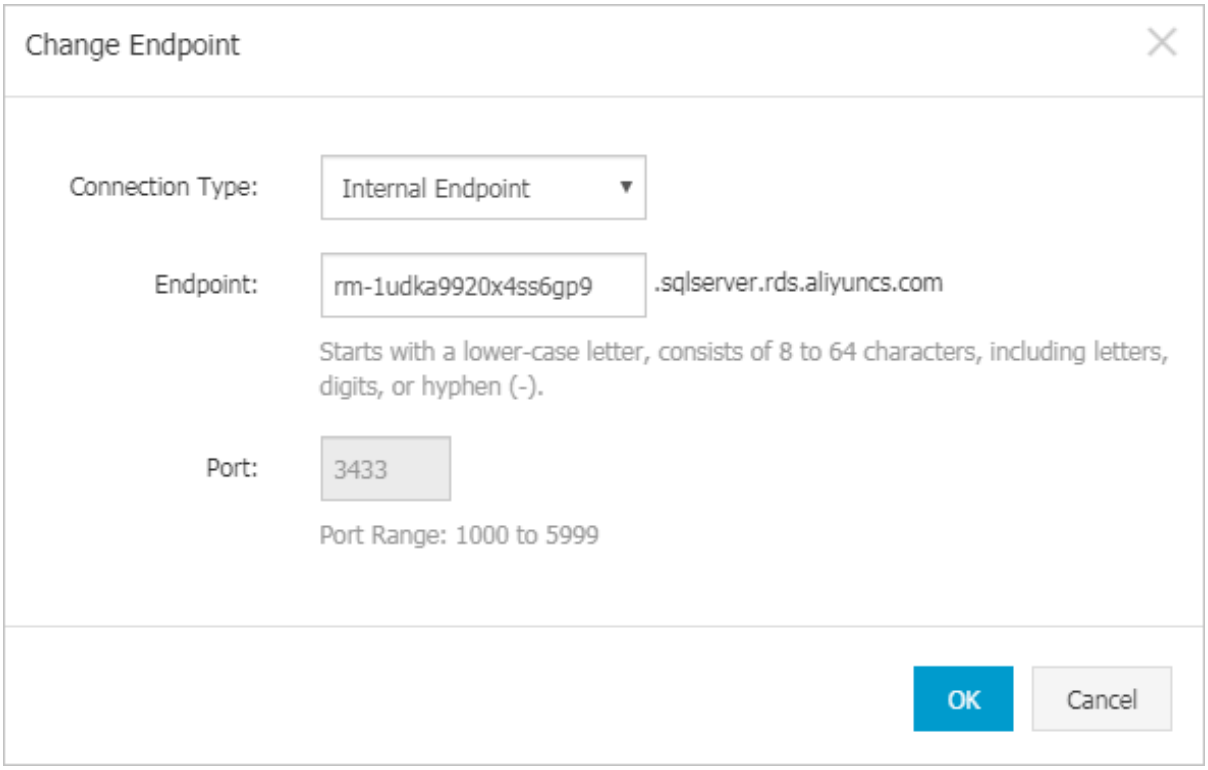
7. Optional. To modify the Internet address or port number, click Change Endpoint. In the displayed dialog box, select a connection type, set the Internet address and port number, and click OK.

   - Connection Type: Select Public Endpoint.

     Note:

The Public Endpoint option is available only after you have applied for the Internet address.

- Endpoint: The address contains 8 to 64 characters, including letters, digits, and hyphens (-). The address prefix must start with a lowercase letter.
- Port: The port number can be modified only when the RDS network type is classic network.



APIs

API	Description
AllocateInstancePublicConnection	Used to apply for an Internet address.

4.3 Creating accounts and databases

4.3.1 Create databases and accounts for an RDS for SQL Server 2017 instance

For an RDS for SQL Server 2017 instance, you need to create an account from the RDS console, and then use the client or DMS to create and manage the database.

Note:

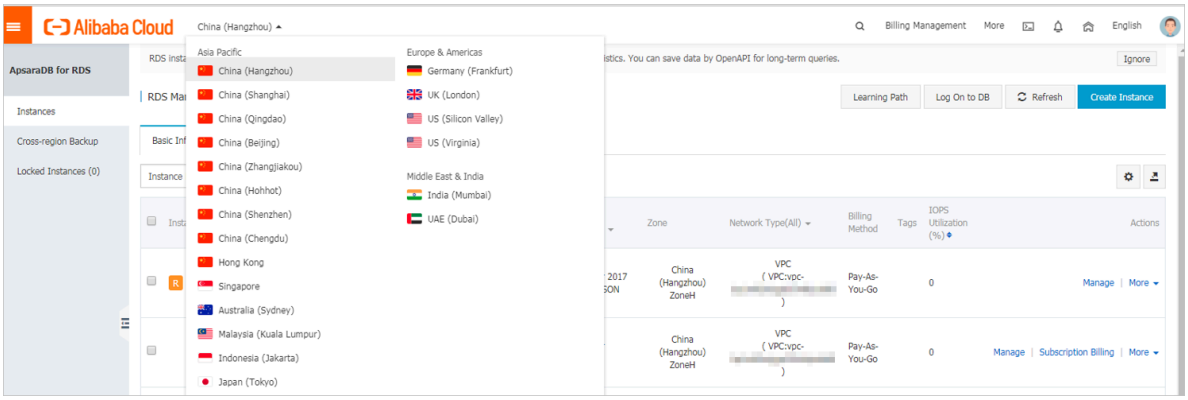
This topic is applicable only to RDS for SQL Server 2017 instances. For instances of other SQL Server versions, see Create databases and accounts for an RDS for SQL Server 2012 or 2016 instance and Create databases and accounts for an RDS for SQL Server 2008 R2 instance.

Precautions

- Databases within the same instance share all the resources of the instance. You can manage standard accounts and databases by using SQL statements.
- When assigning permissions to database accounts, follow the principle of least privilege and create accounts based on the roles required. Assign the appropriate level of permissions to the accounts. When necessary, you can create multiple database accounts and allow each of them to access data relevant to their own business tasks. If an account does not need to write data to a database, assign read-only permissions to the account.
- For database security, you must set strong account passwords and change the passwords regularly.

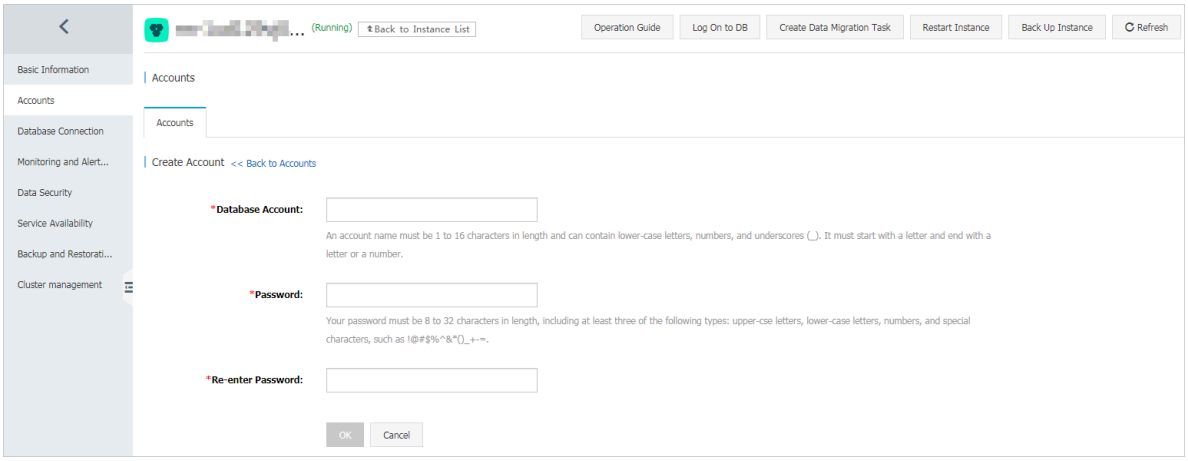
Procedure

1. Log on to the RDS console.
2. Select the region where the instance is located.



3. Find the instance and click its ID.
4. In the left-side navigation pane, click Accounts.
5. Click Create Initial Account.

6. Enter the account information.



Parameter description:

- Database Account: the name of the initial account. It must be 2 to 16 characters in length, and can contain lowercase letters, digits, and underscores (_). It must start with a letter and end with a letter or digit.

  > **Note:**
  > Reserved keywords such as *test* and *root* cannot be set as account names.

- Password:
  - The password must be 8 to 32 characters in length.
  - The password must contain at least three of the following types of characters: uppercase letters, lowercase letters, digits, and special characters.
  - The allowed special characters are as follows:

    ! @ # $ % ^ & * ( ) _ + - =

- Re-enter Password: Enter the password again to make sure you enter the correct password.

7. Click OK.
8. Click Log On to DB in the upper-right corner to go to the RDS Database Logon page of the Data Management Service console.

9. Enter the correct IP address, port number, database username, and password.

   · Parameter description:

   - 1: The IP address and port information of the instance. You can view the IP address and port information on the Basic Information page or Database Connection page.

   - 2: The name of the account to access the database.
   - 3: The password of the account.

10. Click Log On.

> Note:
> If you want your browser to remember your account and password, you can select Remember Password before you click Log On.

11. If the system displays a message, asking you to add the CIDR block of the DMS server to the IP address whitelist of the RDS instance, click Set a Whitelist. For more information, see Configure a whitelist.
12. After the whitelist is configured, click Log On.
13. After you have logged on to the RDS instance, choose SQL Operations > SQL Window in the top navigation bar.
14. In the SQL window, run the following statement to create a database:

```
create database < database name >;
```

15. Click execute.
16. In the SQL window, run the following statement to create a standard account:

```
CREATE LOGIN < login name > WITH PASSWORD = '< password
>';
```

17. Click execute.

> Note:
> Standard accounts that are created in DMS by using T-SQL do not appear in the account list in the console. However, you can use a standard account to log on to the database.

18. In the SQL window, run the following statements to create a database user and associate the user to the standard account that you just created.

```
USE  < database   name >;
CREATE   USER  < user   name >  FOR   LOGIN  < login   name >;
```

19. Click execute. The standard account can access the corresponding database.

FAQ

Can I manage the created account in the read-only instances?

The account created in the master instance is synchronized to the read-only instances . You cannot manage the account in the read-only instances. The account can only read data from the read-only instances.

APIs

API	Description
CreateAccount	Used to create an account.
CreateDatabase	Used to create a database.

4.3.2 Create databases and accounts for an RDS for SQL Server 2012 or 2016 instance

This topic is applicable only to RDS for SQL Server 2012 and 2016 instances. For more information on how to create databases and accounts for other versions, see Create databases and accounts for an RDS for SQL Server 2017 instance and Create databases and accounts for an RDS for SQL Server 2008 R2 instance.

Create an account

You can create a superuser account and standard accounts through the console. The superuser account can be created only through the console.

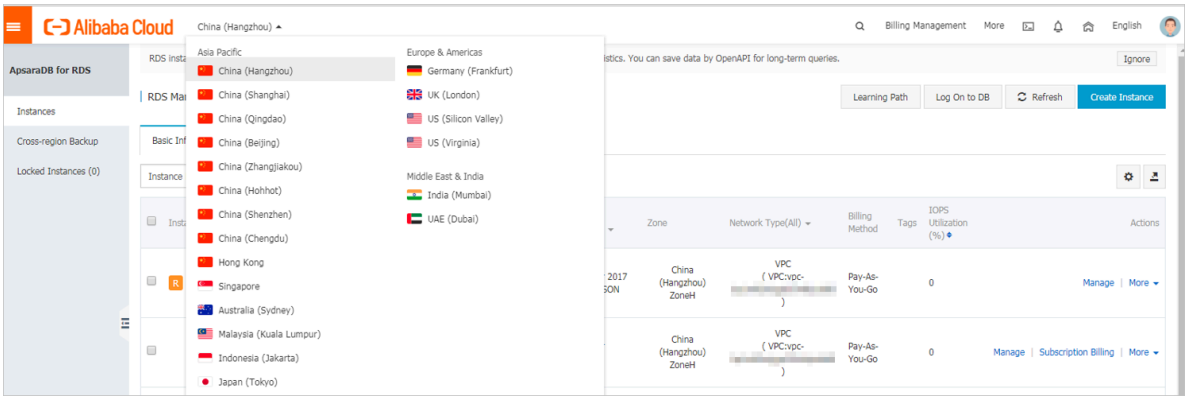
Precautions

- When assigning permissions to database accounts, follow the principle of least privilege and create accounts based on the roles required. Assign the appropriat e level of permissions to the accounts. When necessary, you can create multiple database accounts and allow each of them to access data relevant to their own business tasks. If an account does not need to write data to a database, assign read-only permissions to the account.

- For database security, you must set strong account passwords and change the passwords regularly.

Procedure

1. Log on to the RDS console.
2. In the upper-left corner, select the region where the target instance is located.



3. Find the target instance and click its ID.
4. In the left-side navigation pane, click Accounts.
5. Click Create Account.
6. Enter the account information and click OK.

Parameter	Description
Database Account	The account name contains 2 to 16 characters, including lowercase letters, digits, and underscores (_). It must begin with a letter and end with a letter or digit.
Account Type	· Superuser Account: This option is available only when you create an account for the first time. You can create standard accounts only after you create a superuser account. Each instance has only one superuser account and this superuser account cannot be deleted. · Standard Account: This option is available only after you create a superuser account. One instance can have multiple standard accounts. You must assign database permissions to standard accounts manually.
Password	The password contains 8 to 32 characters, including at least three of the following types of characters: uppercase letters, lowercase letters, digits, and special characters. The allowed special characters are as follows: ! @ # $ % ^ & * ( ) _ + - =

Parameter	Description
Re-enter password	Enter the password again.

Create a database

1. Log on to the RDS console.
2. In the upper-left corner, select the region where the target instance is located.

3. Find the target instance and click its ID.
4. In the left-side navigation pane, click Databases.
5. Click Create Database.
6. Set the following parameters and click OK.

Parameter	Description
Database Name	The database name contains 2 to 64 characters including lowercase letters, digits, underscores (_), and hyphens (-). It must begin with a letter and end with a letter or digit.
Supported Character Set	Select a character set. If the character set you need is not listed, click All and select it from the drop-down list.
Authorized Account	Select the account to which you want to assign permissions. After you select an account, the Account Type parameter is displayed and you can set it to Read/Write, Read-only, or Owner. If no accounts have been created, you can leave the Authorized Account parameter blank.
Remarks	Optional. Enter the other account information that helps to better manage the account. You can enter up to 256 characters.

APIs

API	Description
CreateAccount	Used to create an account.
CreateDatabase	Used to create a database.

4.3.3 Create databases and accounts for an RDS for SQL Server 2008 R2 instance

This topic is applicable only to RDS for SQL Server 2008 R2 instances. For more information on how to create databases and accounts for other versions, see Create databases and accounts for an RDS for SQL Server 2017 instance and Create databases and accounts for an RDS for SQL Server 2012 or 2016 instance.

Create an account

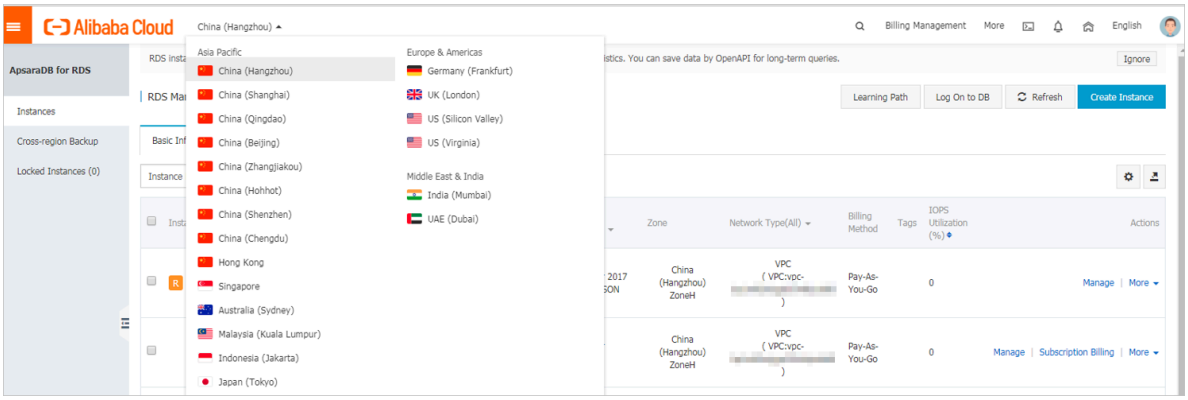
Precautions

- You can create up to 500 accounts for each RDS for SQL Server 2008 R2 instance.
- To migrate data from a local database to RDS, you need to create databases and accounts that are the same as those of the local database.
- When assigning permissions to database accounts, follow the principle of least privilege and create accounts based on the roles required. Assign the appropriate level of permissions to the accounts. When necessary, you can create multiple database accounts and allow each of them to access data relevant to their own business tasks. If an account does not need to write data to a database, assign read-only permissions to the account.
- For database security, set strong passwords for the accounts and change the passwords regularly.

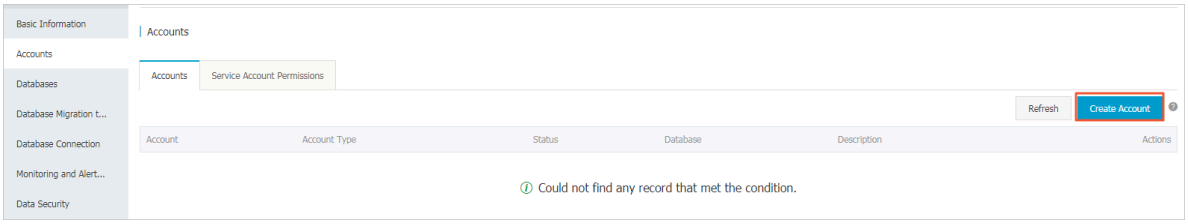
Procedure

1. Log on to the RDS console.

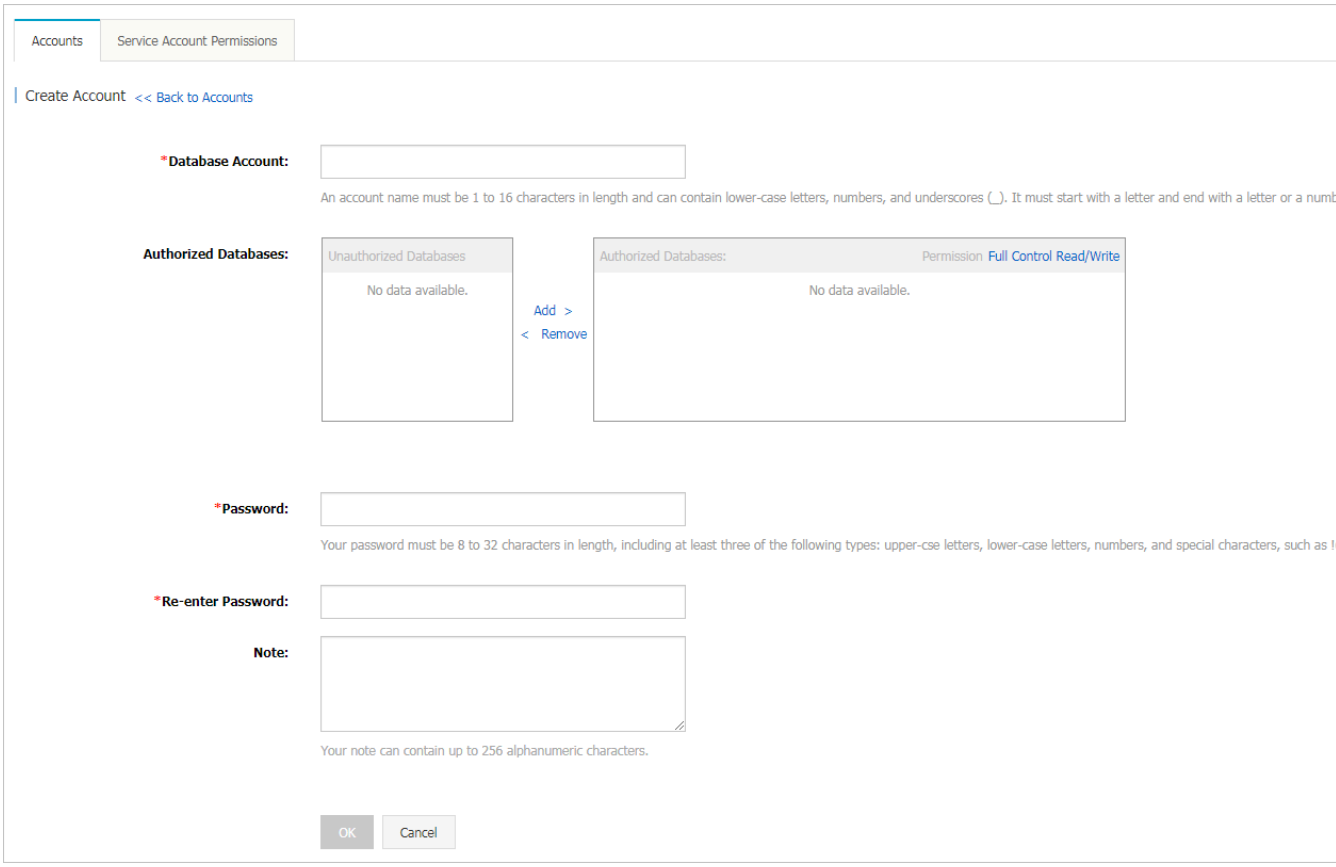
2. In the upper-left corner, select the region where the target instance is located.



3. Find the target instance and click its ID.
4. In the left-side navigation pane, click Accounts.
5. Click Create Account.



6. Enter the account information.



Parameter	Description
Database Account	The account name contains 2 to 16 characters, including lowercase letters, digits, and underscores (_). It must begin with a letter and end with a letter or digit.

Parameter	Description
Authorized Databases	Select the databases for which the account has permissions. If no databases have been created, you can leave this parameter blank. An account can be authorized with multiple databases. To authorize an account to databases, take these steps: a. In the left area, select the target databases. b. Click Add to add the selected databases to the right area. c. Set the account's permission on each database, which can be Read/Write or Read-only. You can also click the button (for example, Full Control Read-only) in the upper-right corner to set the permissions for the databases in batches. 
Password	The password contains 8 to 32 characters, including at least three of the following types of characters: uppercase letters, lowercase letters, digits, and special characters. The allowed special characters are as follows: ! @ # $ % ^ & * ( ) _ + - =
Re-enter Password	Enter the password again.
Note	Optional. Enter the other account information that helps to better manage the account. You can enter up to 256 characters.

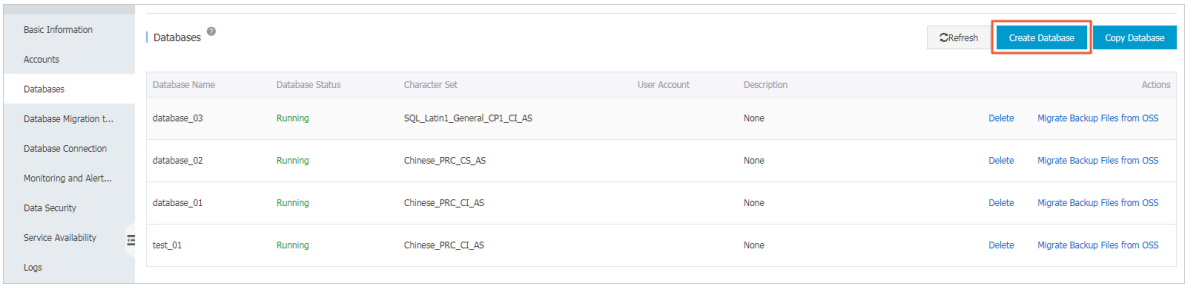
7. Click OK.

Create a database

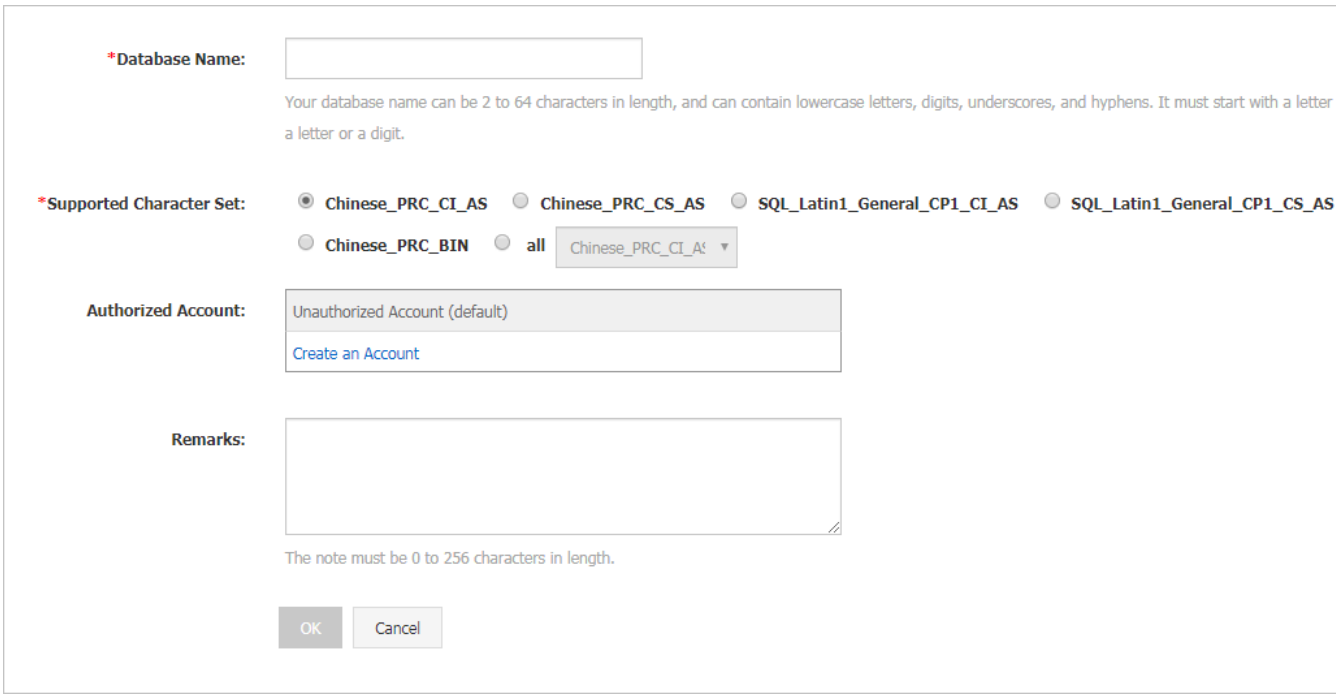
You can create up to 50 databases for an RDS for SQL Server 2008 R2 instance.

1. Log in to the RDS console.
2. In the upper-left corner, select the region where the target instance is located.
3. Find the target instance and click its ID.
4. In the left-side navigation pane, click Databases.

5. Click Create Database.



6. Enter the database information.



Parameter	Description
Database Name	The database name contains 2 to 64 characters, including lowercase letters, digits, underscores (_), and hyphens (-). It must begin with a letter and end with a letter or digit.
Supported Character Set	Select a character set. If the character set you need is not listed, click All and select it from the drop-down list.
Authorized Account	Select the account to which you want to assign permissions. If no accounts have been created, you can leave this parameter blank.
Account Type	This parameter is displayed after you select an authorized account. You can set this parameter to Read/Write or Read-only.
Remarks	Optional. Enter the other account information that helps to better manage the account. You can enter up to 256 characters.

7. Click OK.

Resources

Migrate full backup data to RDS for SQL Server 2008 R2

APIs

API	Description
CreateAccount	Used to create an account.
CreateDatabase	Used to create a database.

5 Connect to an RDS for SQL Server instance

After you create an instance, configure a whitelist, and create a database and an account, you can use Data Management Sevice (DMS) or other database clients to connect to the RDS instance.

Use DMS to connect to an instance

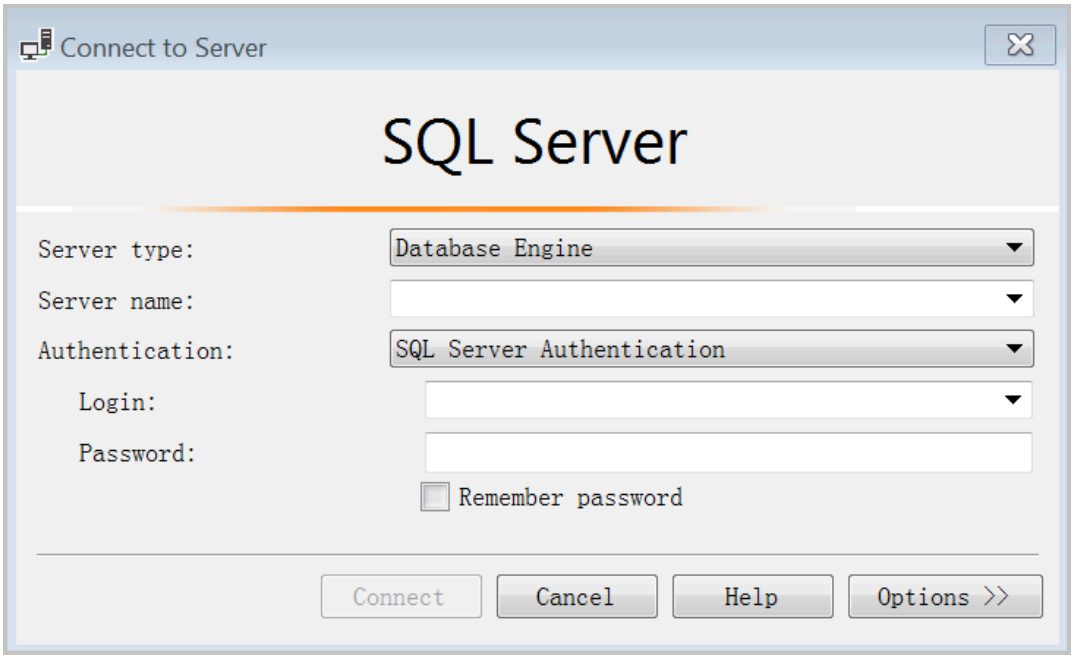
DMS is a graphical data management service provided by Alibaba Cloud. It can be used to manage non-relational databases and relational databases, and supports data and schema management, user authorization, security audit, data trends, data tracking, BI charts, and performance and optimization.

For more information, see Use DMS to log on to an RDS instance.

Use a client to connect to an instance

This topic describes how to use the Microsoft SQL Server Management Studio (SSMS) client to connect to an RDS instance.

1. Start the SSMS client in an ECS instance or your computer.
2. Choose Connect > Database Engine.
3. In the displayed Connect to Server dialog box, enter the logon information.



Parameter	Description
Server type	Select Database Engine.

Parameter	Description
Server name	Enter the connection address and the port number of the RDS instance. Separate the address and the port number with a comma (,), such as `rm - bptest . sqlserver . rds . aliyuncs . com , 3433`. The following procedure shows how to view the internal and public addresses and the port number of the RDS instance: a. Log on to the ApsaraDB for RDS console. b. In the upper-left corner of the page, select the region where the instance is located. c. Click the ID of the instance. d. Find the internal IP address and port number, or the public IP address and port number of the instance in the Basic Information section, as shown in the following figure. 
Authentication	Select SQL Server Authentication.
Login	Enter the account name of the RDS instance.
Password	Enter the password of the account of the RDS instance.

4. Click Connect.

6 Read-only instances

6.1 Introduction to SQL Server read-only instances

Scenario

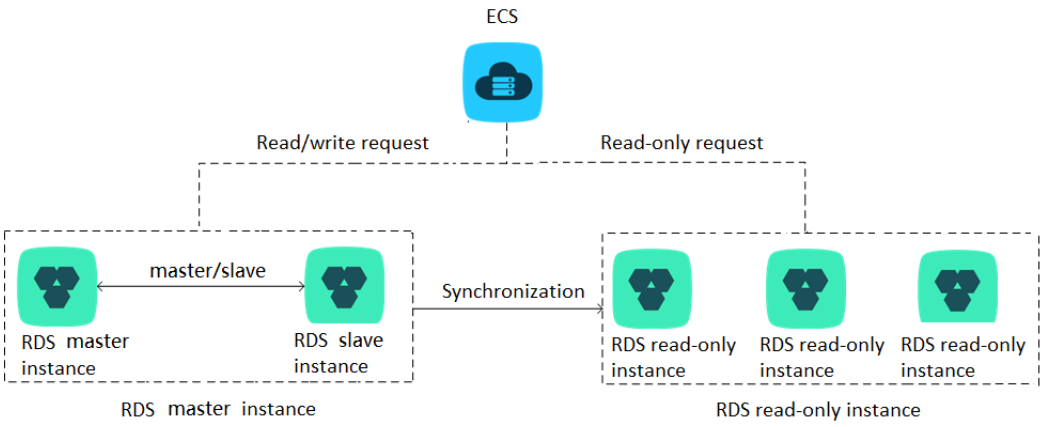
For services that involve a small number of write requests but a great number of read requests, a single instance may not be able to resist the read pressure. As a result, services may be affected. To achieve the elastic expansion of the read ability and share the pressure of the database, you can create one or more read-only instances in a region. The read-only instances can handle massive read requests and increase the application throughput.

Overview

A read-only instance is a read-only copy of the master instance. Changes to the master instance are also automatically synchronized to all relevant read-only instances.

> Note:
>
> - For RDS SQL Server, only the SQL Server 2017 Cluster (AlwaysOn) Edition supports read-only instances.
> - Each read-only instance adopts a single-node architecture (without slave nodes).

The following topology shows the positioning of the read-only instance.



Pricing

The billing method of read-only instances is Pay-As-You-Go. The following table lists the prices of common instances.

Hourly prices of specifications and storage

Region	rds.mssql.s2.large 2-core 4 GB	rds.mssql.s2.xlarge 2-core 8 GB	rds.mssql.s3.large 4-core 8 GB	rds.mssql.m1.medium 4-core 16 GB	rds.mssql.c1.large 8-core 16 GB	rds.mssql.c1.xlarge 8-core 32 GB	rds.mssql.c2.xlarge 16-core 64 GB	Storage
China mainland's regions	$0.225	$0.447	$0.459	$0.851	$0.888	$1.732	$3.389	$0.0003/GB
Hong Kong	$0.264	$0.522	$0.537	$0.993	$1.035	$2.02	$3.954	$0.0004/GB
US (Virginia)	$0.273	$0.542	$0.556	$1.028	$1.072	$2.093	$4.096	$0.0003/GB
US (Sillicon Vally)	$0.292	$0.579	$0.595	$1.099	$1.146	$2.237	$4.378	$0.0003/GB
Singapore	$0.311	$0.616	$0.632	$1.170	$1.220	$2.381	$4.661	$0.0004/GB
Australia	$0.315	$0.622	$0.646	$1.209	$1.259	$2.415	$4.829	$0.0005/GB
Malaysia	$0.296	$0.586	$0.601	$1.112	$1.159	$2.262	$4.428	$0.0004/GB
Indonesia	$0.311	$0.616	$0.632	$1.170	$1.220	$2.381	$4.661	$0.0004/GB
Japan	$0.311	$0.615	$0.632	$1.171	$1.221	$2.381	$4.660	$0.0005/GB
Germany (Frankfurt)	$0.311	$0.615	$0.632	$1.171	$1.221	$2.381	$4.660	$0.0005/GB
UK (London)	$0.311	$0.615	$0.632	$1.171	$1.221	$2.381	$4.660	$0.0005/GB

Region	rds.mssql.s2.large 2-core 4 GB	rds.mssql.s2.xlarge 2-core 8 GB	rds.mssql.s3.large 4-core 8 GB	rds.mssql.m1.medium 4-core 16 GB	rds.mssql.c1.large 8-core 16 GB	rds.mssql.c1.xlarge 8-core 32 GB	rds.mssql.c2.xlarge 16-core 64 GB	Storage
UAE (Dubai)	$0.327	$0.646	$0.665	$1.230	$1.283	$2.500	$4.895	$0.0007/GB
India (Mumbai)	$0.296	$0.586	$0.601	$1.112	$1.159	$2.262	$4.428	$0.0004/GB

Features

Read-only instances offer the following features:

- Account and database management: No account or database maintenance is required for a read-only instance. Both the account and database are synchronized through the master instance.
- Billing: Read-only instances support billing measured per hour, which is user-friendly and cost-efficient.
- Specifications: The specifications of a read-only instance can differ from those of the master instance, and can be changed at any time. It is recommended that the specifications of the read-only instance be equal to or higher than those of the master instance; otherwise the read-only instance may have high latency or workloads.
- Network type: can differ from that of the master instance.
- Whitelist: When a read-only instance is created, it automatically copies the whitelist of the master instance. However, the whitelist of the read-only instance is independent from that of the master instance. You can modify the whitelist of the read-only instance by referring to Configure a whitelist.
- Monitoring and alarms: Up to 20 system performance monitoring views can be used, which includes disk capacity, IOPS, connections, CPU utilization, and network traffic. Users can view the load of instances at ease.

Restrictions

- Quantity of read-only instances:

Database	Quantity
SQL Server	Up to 7 read-only instances can be created for each master instance.

- Read-only instances do not support backup settings or manual backup.
- Instance recovery:
  - Read-only instances do not support the creation of temporary instances through backup files or a point in time. Read-only instances do not support the overwriting of instances using backup sets.
  - After creating a read-only instance, the master instance does not support data recovery through the direct overwriting of instances using backup sets.
- You cannot migrate data to read-only instances.
- You cannot create or delete databases for read-only instances.
- You cannot create or delete accounts for read-only instances.
- You cannot authorize accounts or modify account passwords for read-only instances.

FAQs

Can the accounts on the master instance be used on the read-only instances?

Answer: Accounts on the master instance are synchronized to the read-only instances . You can use the accounts to read data from the read-only instances but cannot write data into the read-only instances.

6.2 Create an RDS for SQL Server read-only instance

You can create read-only instances to handle large numbers of read requests and increase the application throughput. A read-only instance is a read-only replica of the master instance. Changes to the master instance are automatically synchronized to all read-only instances attached to the master instance.

For more information, see Introduction to SQL Server read-only instances.

Prerequisites

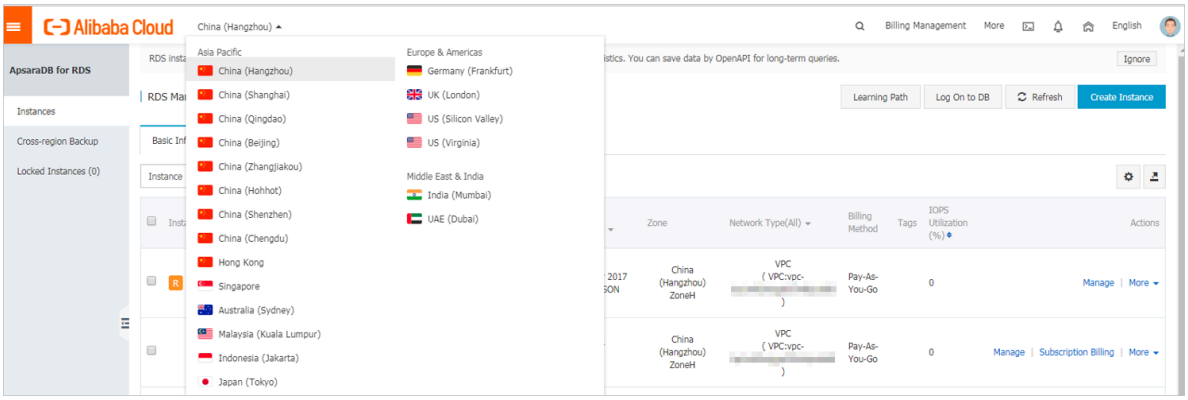
The master instance adopts the Cluster Edition and runs the SQL Server 2017 engine.

Precautions

- You can only create read-only instances under the master instance but cannot switch an existing instance to a read-only instance.
- Creating a read-only instance does not affect the master instance because the read-only instance copies data from the slave instance.
- You can create up to seven read-only instances for the master instance.
- A read-only instance is charged according to the Pay-As-You-Go billing method. That is, fees are deducted once per hour, and the deducted fees vary depending on the specifications of the read-only instance at the time of fee deduction. For more information, see the "Pricing" section in Introduction to SQL Server read-only instances.

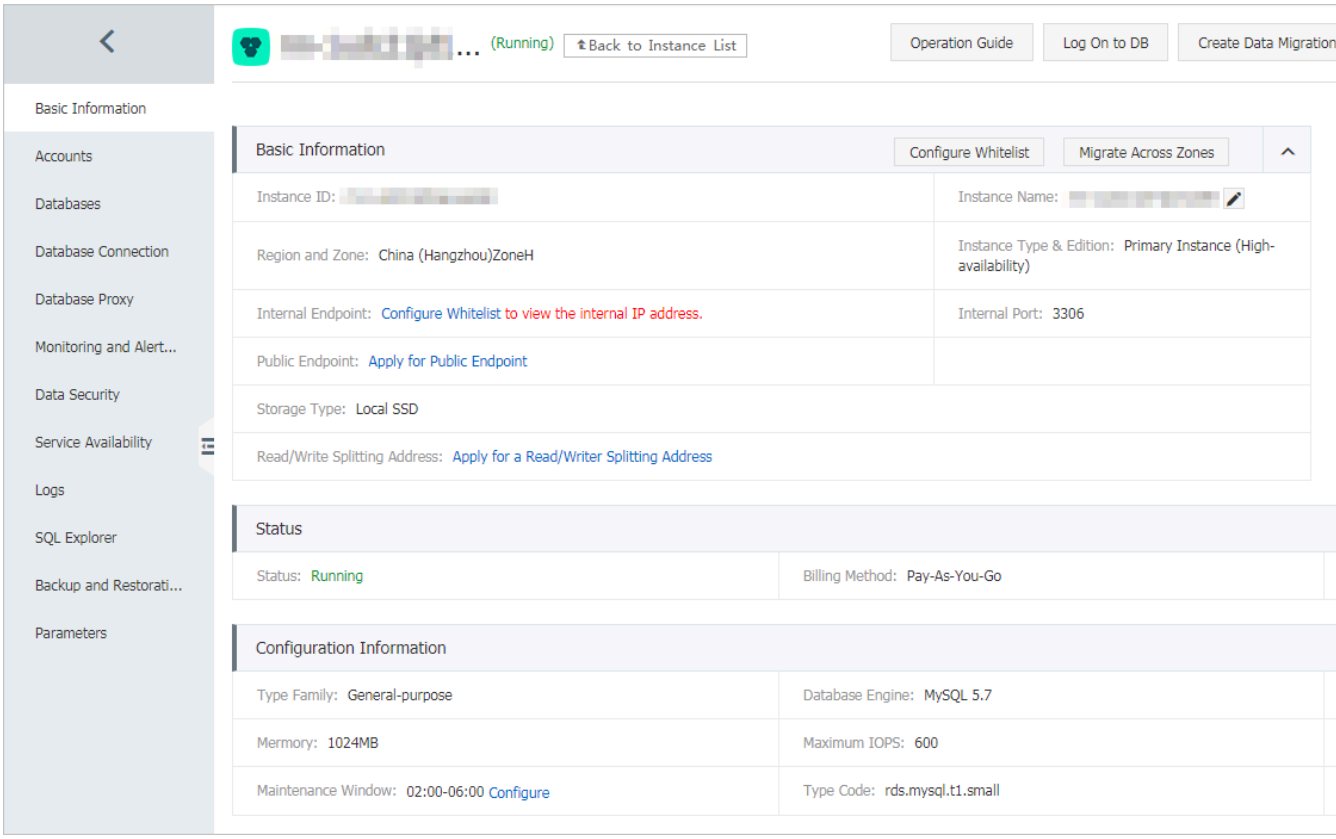
Create a read-only instance

1. Log on to the RDS console.
2. In the upper-left corner, select the region where the target instance is located.



3. Find the target instance and click the instance ID.

4. Click Add Read-only Instance.



5. On the purchase page, choose the configuration of the read-only instance, and then click Buy Now.

> **Note:**
>
> - We recommend that the read-only instance and the master instance be in the same VPC.
> - To guarantee sufficient I/O for data synchronization, we recommend that the configuration of the read-only instance (the memory) is greater than or equal to that of the master instance.
> - We recommend that you purchase multiple read-only instances based on your business needs to improve availability.

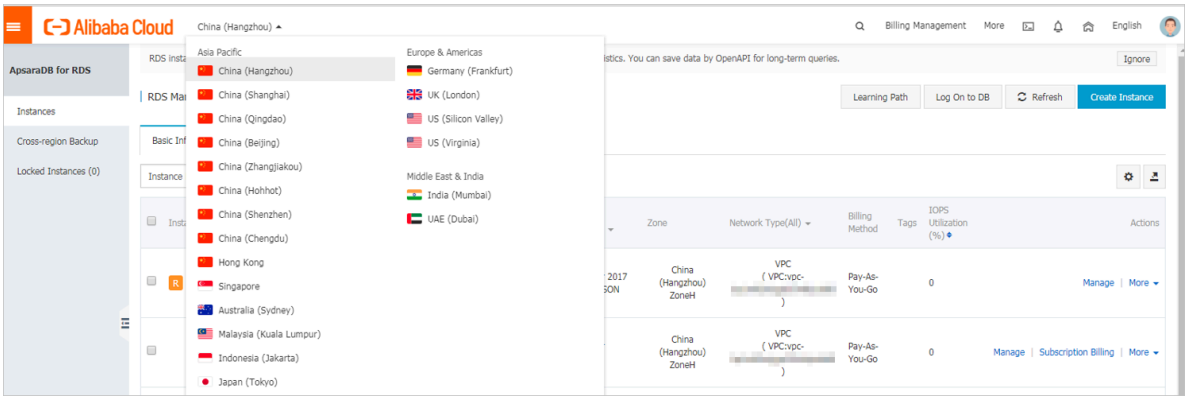
6. On the Order Confirmation page, review the order information, select the terms and agreements as prompted, click Pay Now, and complete the payment.

   The instance creation takes a few minutes.

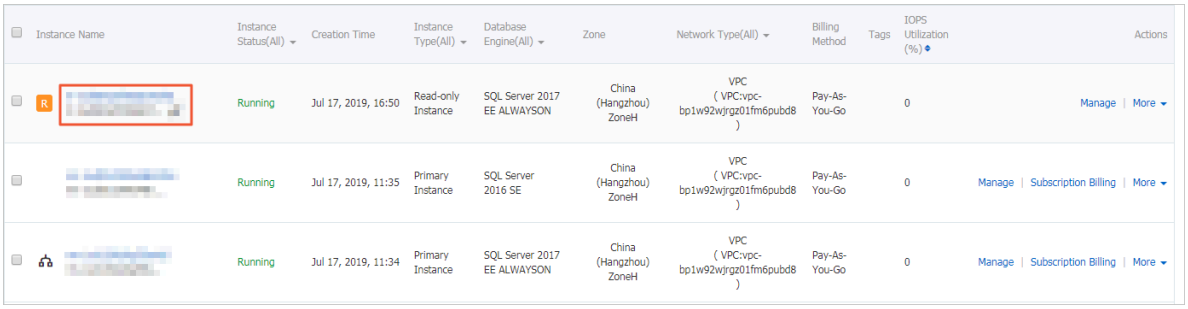
View a read-only instance

View a read-only instance in the instance list

1. Log on to the RDS console.
2. Select the region where the read-only instance is located.

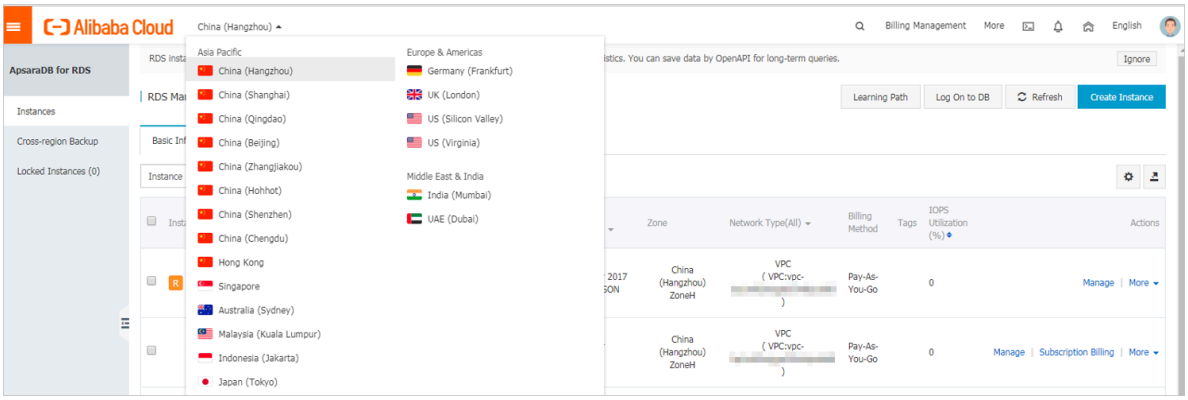


3. In the instance list, find the read-only instance and click its ID.

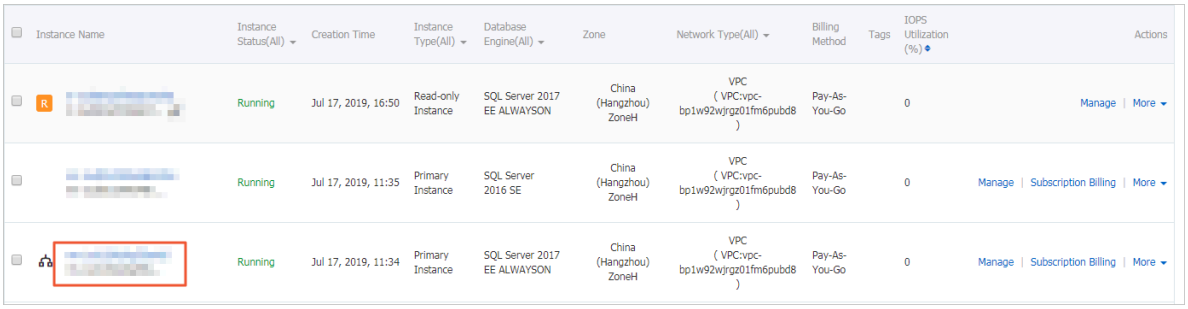


View a read-only instance on the Basic Information page for the master instance

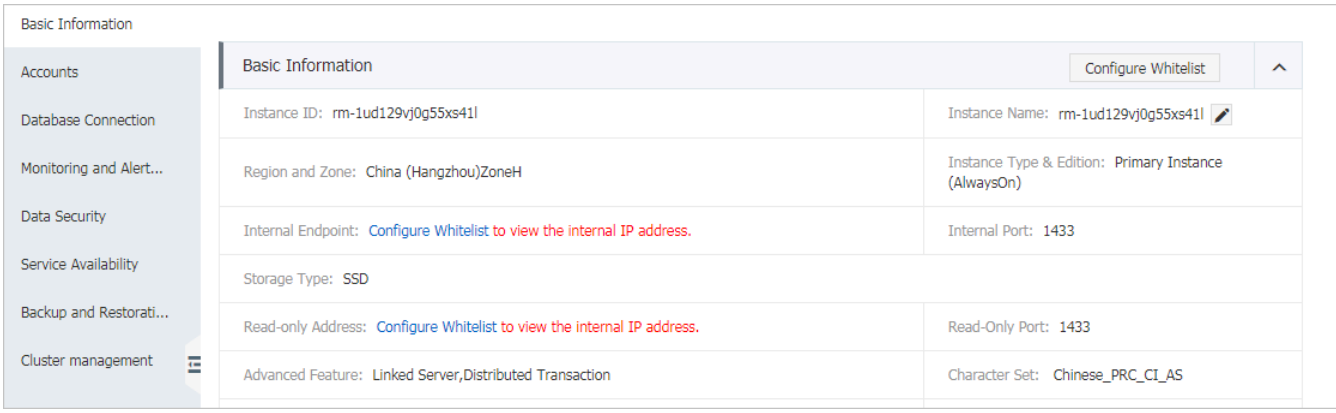
1. Log on to the RDS console
2. Select the region where the master instance is located.



3. In the instance list, find the master instance and click its ID.



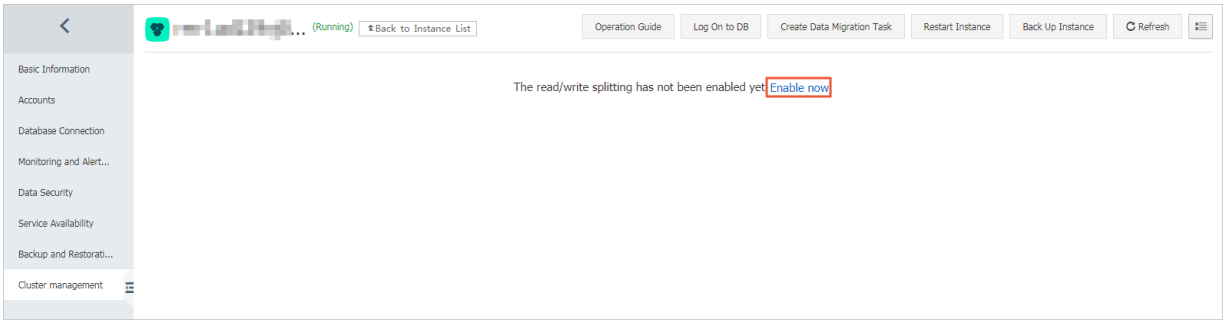
4. On the Basic Information page of the master instance, move the pointer over the number below Read-only Instance and click the ID of the read-only instance.



View a read-only instance on the Cluster management page

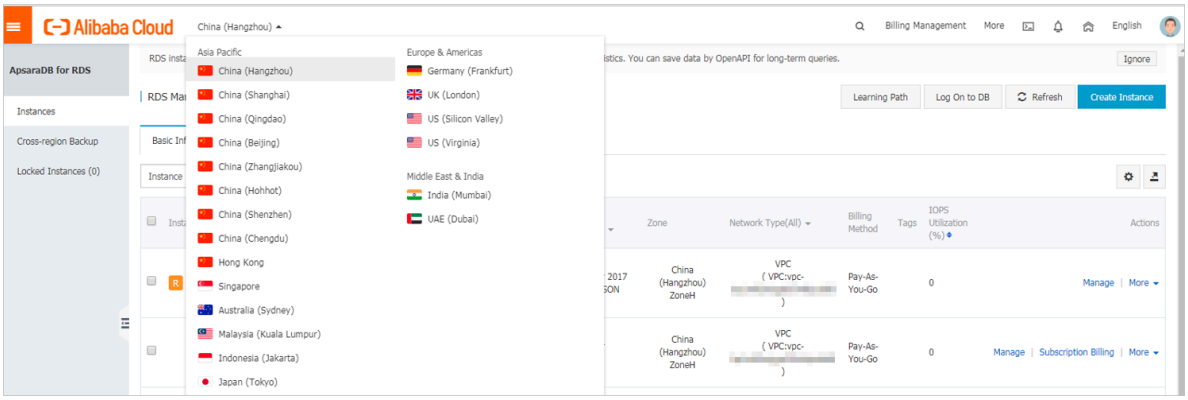
Prerequisites

You have enabled read/write splitting on the Cluster management page. For more information, see Enable read/write splitting.

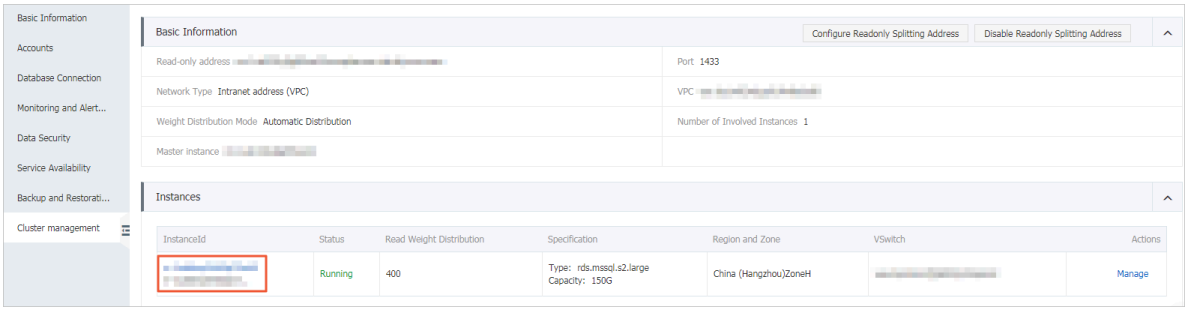


1. Log on to the RDS console.

2. Select the region where the master instance is located.

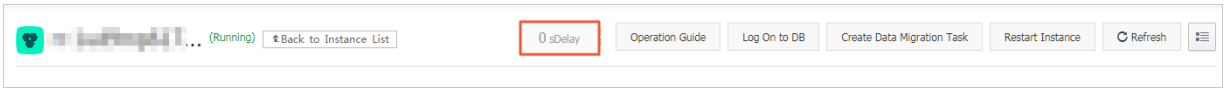


3. In the instance list, find the master instance and click its ID.
4. In the left-side navigation pane, click Cluster management.
5. Find the read-only instance and click its ID.



View the delay time of a read-only instance

When a read-only instance synchronizes data from the master instance, the read-only instance may lag behind the master instance by a small amount of time. You can view the delay on the Basic Information page of the read-only instance.



APIs

API	Description
CreateReadOnlyDBInstance	Used to create an RDS read-only instance.

7 Stored procedures

Copy a database in the instance

T-SQL

sp_rds_copy_database

Supported editions:

- **High-Availability Edition**
- **Basic Edition**

Description

Copies a database in an instance.

> **Note:**
> **The remaining storage capacity of the instance must be at least 1.3 times the database size.**

Method

```
EXEC   sp_rds_cop  y_database  ' testdb ',' testdb_cop  y '
```

- **The first parameter represents the source database.**
- **The second parameter represents the target database.**

Bring a database online

T-SQL

sp_rds_set_db_online

Supported editions:

- **High-availability Edition**
- **Basic Edition**

Description

After you bring a database offline, you cannot directly bring it online by running the ALTER DATABASE statement. Use this stored procedure to bring a database online.

Method

```
EXEC   sp_rds_set  _db_online  ' db '
```

The parameter represents the database to be brought online.

Set global database privileges

T-SQL

sp_rds_set_all_db_privileges

Supported editions:

- **High-Availability Edition**
- **Basic Edition**

Description

Grants the privileges of all or multiple databases to a user.

Note:
Your current database privileges must be higher or equal to the privileges you want to grant.

Method

```
sp_rds_set  _all_db_pr  ivileges  ' user ',' db_owner ',' db1 , db2
...'
```

- **The first parameter represents the user that you want to grant privileges to.**
- **The second parameter represents the database role to be granted to the user.**

- The third parameter represents the databases. You can specify one or more databases, and separate multiple database databases with commas (,). (If the parameter is left blank, it indicates all user databases.)

Delete a database

T-SQL

sp_rds_drop_database

Supported editions:

High-Availability Edition

Note:
The Basic Edition currently does not support this stored procedure. For the Basic Edition, you can delete a database by running `DROP DATABASE db`.

Description

Delete a database from the instance. Dependent objects will be deleted when a database is deleted. The High-Availability Edition automatically deletes the mirror and terminates the database connection.

Method

```
EXEC sp_rds_dro p_database ' db '
```

The parameter represents the database to be deleted.

Set change tracking

T-SQL

sp_rds_change_tracking

Supported editions:

High-Availability Edition

Description

Sets change tracking for the database.

Method

```
EXEC sp_rds_cha nge_tracki ng ' db ', 1
```

- The first parameter represents the database name.

- The second parameter indicates whether change tracking is enabled.
  - 1: Enable.
  - 0: Disable.

Enable change data capture (CDC)

T-SQL

sp_rds_cdc_enable_db

Supported editions:

High-Availability Edition

> Note:
> If mirroring exists, this stored procedure also removes the availability group. In this case, this stored procedure is not recommended.

Description

Enables change data capture.

Method

```
USE   db
GO
sp_rds_cdc  _disable_d  b
```

Disables change data capture

T-SQL

sp_rds_cdc_disable_db

Supported editions:

High-Availability Edition

> Note:
> If mirroring exists, this stored procedure also removes the availability group. In this case, this stored procedure is not recommended.

Description

Disables change data capture.

Method

```
USE   db
GO
sp_rds_cdc  _disable_d  b
```

Configure instance parameters

T-SQL

sp_rds_configure

Supported editions:

- High-availability Edition
- Basic Edition

Description

Sets instance parameters. If your instance has primary and secondary nodes, the configuration is automatically synchronized from the primary node to the secondary node.

Parameters currently supported:

- fill factor (%)
- maximum worker threads
- cost threshold for parallelism
- max degree of parallelism
- min server memory (MB)
- max server memory (MB)
- blocked process threshold (s)

Method

```
EXEC   sp_rds_con  figure  ' max   degree   of   parallelis  m ', 4
```

- The first parameter represents the instance parameters to be set.
- The second parameter represents the instance parameter value.

Add a linked server

T-SQL

sp_rds_add_linked_server

Supported editions:

- **SQL Server 2012/2016 Standard Edition High-Availability series**
- **SQL Server 2012/2016 Enterprise Edition High-Availability series**

Description

Adds a linked server to the instance. Supports distributed transactions. The linked server created for both the primary and secondary nodes. If a switchover occurs, you do not need to add the link server again.

Method

```
 DECLARE
@ linked_ser  ver_name   sysname  =  N ' yangzhao_s  lb ',
@ data_sourc  e   sysname  =  N '****. sqlserver . rds . aliyuncs .
 com , 3888 ', -- style :  10 . 1 . 10 . 1 , 1433
@ user_name   sysname  =  N ' ay15 ' ,
@ password   nvarchar ( 128 ) =  N '******',
@ source_use  r_name   sysname  =  N ' test ',
@ source_pas  sword   nvarchar ( 128 ) =  N '******',
@ link_serve  r_options   xml
=  N '
            < rds_linked  _server >
                < config   option =" data   access "> true </ config >
                < config   option =" rpc "> true </ config >
                < config   option =" rpc   out "> true </ config >
            </ rds_linked  _server >
'

 EXEC   sp_rds_add  _linked_se  rver
@ linked_ser  ver_name ,
@ data_sourc  e ,
@ user_name ,
@ password ,
@ source_use  r_name ,
@ source_pas  sword ,
@ link_serve  r_options
```

Set a trace flag

T-SQL statements

sp_rds_dbcc_trace

Supported editions:

- **High-availability Edition**
- **Basic Edition**

Description

Sets trace flags for the instance. Only partial trace flags are currently supported. If your instance has primary and secondary nodes, the trace flags are automatically synchronized from the primary node to the secondary node.

Method

```
EXEC   sp_rds_dbc  c_trace  ' 1222 ', 1 / 0
```

- The first parameter represents the trace flag.
- The second parameter indicates whether the trace flag is enabled or disabled.
  - 1: Enable.
  - 0: Disable.

Rename a database

T-SQL

sp_rds_rename_database

Supported editions:

Basic Edition

Description

Renames a database.

Note:
This stored proceudre does not rename the physical database file.

Method

```
EXEC   sp_rds_ren  ame_databa  se  ' db ',' new_db '
```

- The first parameter represents the database to be renamed.
- The second parameter represents the new name of the database.