

ApsaraDB for RDS

Quick Start (PostgreSQL)

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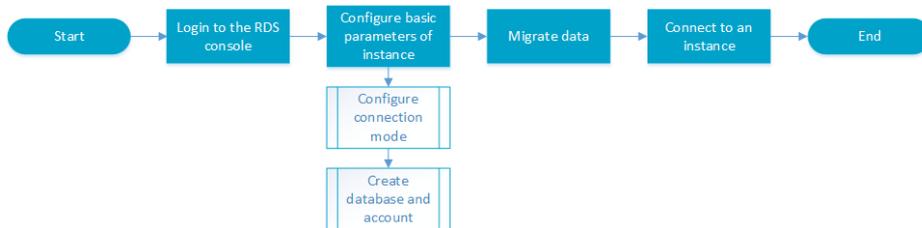
Getting started with ApsaraDB

The Alibaba Relational Database Service (RDS) is a stable, reliable, and auto-scaling online database service. Based on the Apsara distributed file system and high-performance storage, the RDS supports MySQL, SQL Server, PostgreSQL, and PPAS (highly compatible with Oracle) engines. It provides a complete set of solutions for disaster recovery, backup, monitoring, migration, and other features, to free you from the resources spent on database operation and management.

You can manage the RDS through the RDS console, the API, or the SDK.

Document overview

This document describes the following entry level task.



For more information about function and pricing of the ApsaraDB, please log in to the [Official Website of ApsaraDB](#).

General description definition

Description	Note
Local database/Source database	Refers to the database deployed in the local equipment room or the database not on the ApsaraDB. In most cases, it refers to the source database to be migrated to the ApsaraDB in this document.
RDS for XX (XX is MySQL, SQL Server, PostgreSQL, or PPAS)	RDS for XX indicates the RDS of a specific database type, for example, RDS for MySQL means the instance enabled on the RDS and the database type is MySQL.

Instructions before use

To ensure instance stability and security, the RDS for PostgreSQL has some restrictions, as detailed below:

Operations	RDS Restrictions
Modifying database parameter settings	Currently not supported
Database root permission	Cannot provide the superuser permission
Database backup	Data backup can only be performed through pg_dump
Data migration	Data backed up by pg_dump can only be restored through psql
Building database replication	The system automatically builds the HA mode based on PostgreSQL stream replication. The PostgreSQL Standby node is invisible and cannot be accessed directly
Restarting the RDS instance	The instance must be restarted through the RDS console or OPEN API

Login to the RDS console

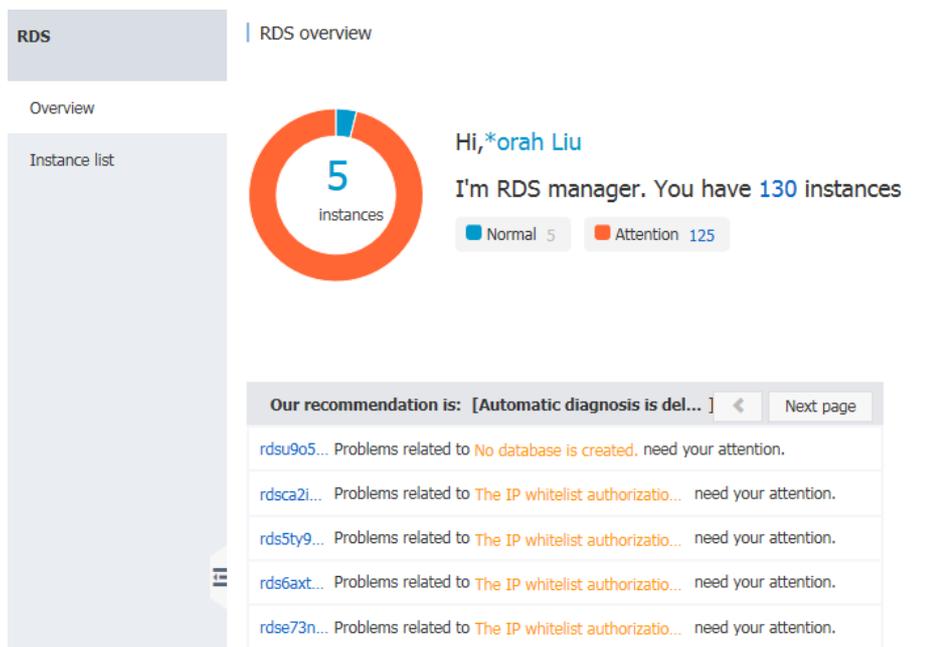
Management operations on the instances on the RDS need to be performed through the RDS console. This chapter describes how to log in to the RDS Console and access the specific instance management console interface to perform subsequent instance management and control operations.

Prerequisites

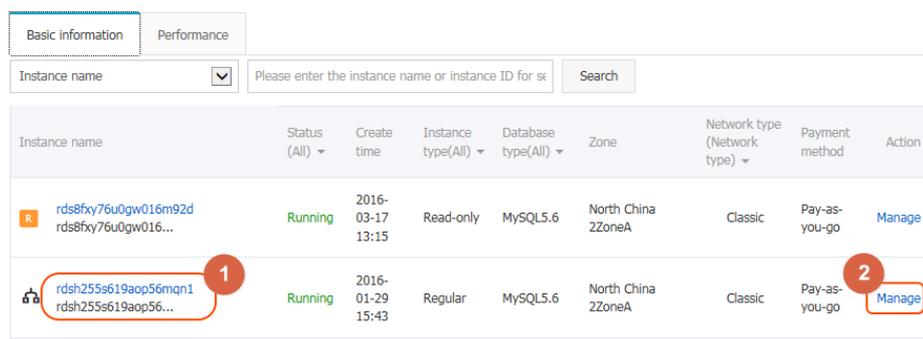
Before logging in to the RDS Console, you need to buy the RDS instance. For instruction to buy a RDS instance, please refer to [Purchase](#). For detailed charging standards, refer to [RDS Price](#).

Operation procedure

Use the account for purchasing RDS to log in to the RDS Console. The system displays the **RDS Overview** interface, as shown in the figure below.



Select **Instance List** in the menu, and click **Instance Name** of the database or the corresponding **Manage** button to access the instance management interface, as shown in the figure below.



Subsequent operations

After accessing the specific instance management console, you can manage the instance account and database, set instance parameters, etc.

Setting the basic configuration

Setting a white list

For the security and stability of the database, you need to add IP addresses or IP segments used to access the database to a white list. This section describes how to set a white list. **Before using the target instance, you need to modify the white list.**

Context

You can access the database in three scenarios:

Access the ApsaraDB through the Internet

Refer to [Set Intranet and Internet addresses](#) to apply for an Internet IP address.

Refer to this section to add the application service IP address to the white list.

If you cannot connect to the ApsaraDB after adding the application service IP address to the white list, refer to [How to locate the local IP address using ApsaraDB for MySQL](#) to obtain the actual IP address of the application service.

Access the ApsaraDB through the Intranet:

Ensure that the network type is the same for ApsaraDB and ECS. For details about how to set the network type, refer to [Set network type](#).

Refer to [Set Intranet and Internet addresses](#) to apply for an Intranet IP address.

Refer to this section to add the ECS IP address to the white list.

Access the ApsaraDB through the Internet and Intranet simultaneously:

Ensure that the network type is the same for ApsaraDB and ECS, and set the access mode to **High Security Mode**. For details about how to set the network type, refer to [Set network type](#).

Refer to [Set Intranet and Internet addresses](#) to apply for Internet and Intranet IP addresses.

Refer to this section to add the application service IP address and ECS IP address to the white list.

Operation procedure

Log in to the RDS Console and select the target instance.

Select **Data Security** in the instance menu.

On the *Data Security* page, click **Modify** after the default group, as shown in the figure below.

You can also click **Clear** after the default group to delete the white list from the default group, and click **Add White List Group** to create a custom group.



On the *Add White List Group* page, delete the default white list *127.0.0.1*, enter a custom white list and then click **OK**, as shown in the figure below.

Parameters are described as follows:

- Group name: The group name contains 2 to 32 characters which consist of lowercase letters, digits or underscores. The group name must start with a lowercase letter and end with a letter or digit. The default group cannot be modified or deleted.
- Intra-group white list: Enter IP addresses or IP segments which can access the database. IP addresses or IP segments are separated by commas.
 - 1,000 white lists can be set for MySQL, PostgreSQL and PPAS, and 800 white lists can be set for SQL Server.
 - The white list can contain IP addresses (for example, 10.10.10.1) or IP segments (for example, 10.10.10.0/24, which indicates any IP address in the format of 10.10.10.X can access the database).
 - % or 0.0.0.0/0 indicates any IP address is allowed to access the database. **This configuration greatly reduces security of the database, and thus is not recommended unless necessary.**
 - After an instance is created, the local loopback IP address 127.0.0.1 is set as the default white list, and thus external IP addresses are prohibited to access this instance.
- Load Intranet IP address of ECS: Click the IP address, and ECS of the same account is displayed. You can add the ECS to the white list.

Subsequent operations

Correct use of the white list can provide improved access security protection for RDS, and thus it is recommended to periodically maintain the white list.

During future operations, you can click **Modify** after the group name to modify an existing group, or click **Delete** to delete an existing group.

Configure the connection mode

If your applications are deployed on the ECS in the same region, you do not need an Internet address. In this case, skip this step. If your applications are deployed on the ECS in the other region or a system other than Alibaba Cloud, you need to apply for an Internet address and use it for application interconnection.

Background information

The RDS provides two kinds of connection addresses: Intranet address and Internet address.

- The Intranet address or the Internet address can be used only when **Access Mode** is set to **Standard Mode**.
 - If your applications are deployed on the ECS in the same region, you can use the Intranet address. The system provides an Intranet address by default, and you can directly modify the connection address.
 - If your applications are deployed on the ECS in the other region or a system other than Alibaba Cloud, you need to use an Internet address. You can click the **Apply for an Internet Address** to release an Intranet address and generate an Internet address.
- The Intranet address and the Internet address can be used at the same time only when **Access Mode** is set to **High Security Mode**. If your applications are deployed on the ECS in the same region and a system other than Alibaba Cloud at the same time, you must use both Intranet and Internet addresses.

Note

- The RDS will charge a fee for traffic using an internet address. For detailed charges, please refer to **RDS Price**.
- To get a higher transmission rate and a higher security level, you are recommended to migrate the applications to an Alibaba ECS in the same region as your RDS.

Operation procedure

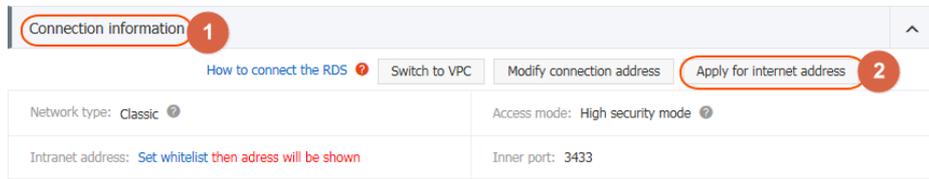
Both the Intranet address and the Internet address are used in this example. When using the RDS, please configure the connection mode based on the system plan.

1. Log in to the RDS console and select the target instance.

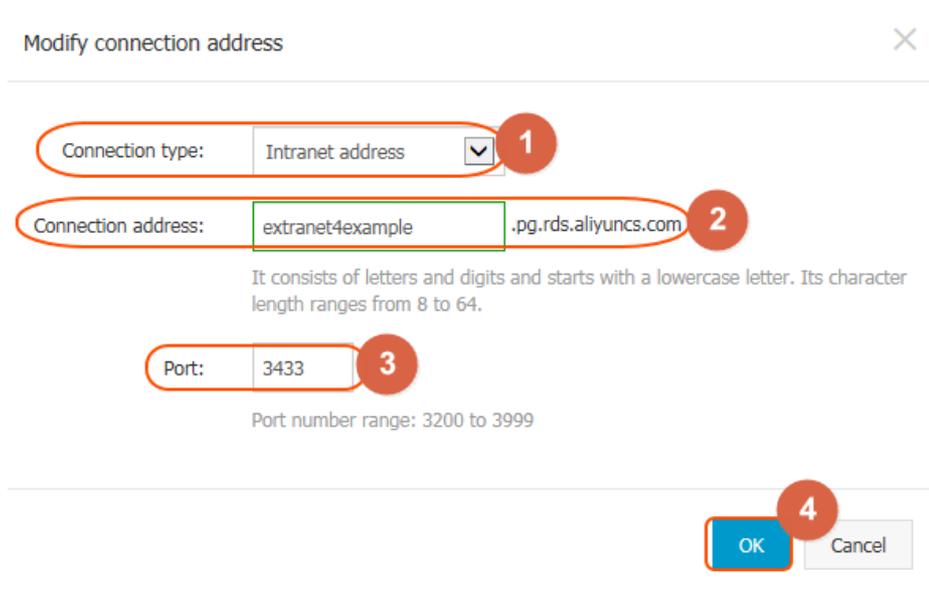
2. Select **Database Connection** in the menu.

Click **Apply for an Internet Address** in *Database Connection*, and click **OK** on the displayed confirmation interface to generate an Internet address, as shown in the figure below.

Traffic at the Internet address may incur charges and reduce the instance security. Please be cautious about your selection.



Click **Modify the Connection Address**, set the Intranet and the Internet connection addresses and port numbers in the displayed window, and click **OK**, as shown in the figure below.



- Connection type: Select **Intranet Address** or **Internet Address**.
- Connection address: The address format is `xxx.pg.rds.aliyuncs.com` , where `xxx` is a user-defined field consisting of 8 to 64 characters (only letters and digits are supported). It must begin with a lowercase letter, for example, `extranet4example`.
- Port: indicates the number of the port through which the RDS provides external services, which can be an integer within the range of 3,200 to 3,999.

Creating a database and an account

Before using a database, you need to create the database and an account in the RDS instance. And before database migration, you need to create the same database in the local database and the RDS instance and create the same account in the RDS instance and the local database.

Background information

- To migrate the local database to the RDS, please use the consistent migration account and database in the RDS database and the local database.
- Databases under a single instance share all the resources of this instance. PostgreSQL instances have no limit on database or account.

Note:

- When assigning database account permissions, please follow the minimum permission principle and service roles to create accounts. Rationally assign Read-Only and Read/Write permissions as needed. When necessary, you may split database accounts and databases into smaller units so that each database account can only access data for its own services. If you do not need to write data to a database, please assign Read-Only permission.
- Please use strong passwords for database accounts and change the passwords on a regular basis.

Operation procedure

1. Log in to the RDS console and select the target instance.
2. Select **Account Management** in the menu, and click **Create an Initial Account**, as shown in the figure below.



Enter the information of the account to create, and click **OK**, as shown in the figure below.

Create account [Back to account management](#)

1 Database account:

It consists of lowercase letters, digits, or underscores, with a letter in the beginning and a letter or digit in the end. It has a maximum of 16 characters.

2 *Password:

It consists of letters, digits, strikethroughs, or underscores, with a character length of 6 to 32.

3 *Confirm password:

4

- Database account: The account consists of 2 to 16 characters (which can be lowercase letters, digits or underscores). It must begin with a letter and end with a letter or digit, for example, *myuser*.
- Password: It refers to the password corresponding to this account. The password consists of 6 to 32 characters which may be letters, digits, hyphens or underscores, for example, *mypassword*.
- Confirm the password: Re-enter the same password.

Use the DMS client to run the following command to create a database.

Note:** For the use of the DMS, please refer to [Connecting to an Instance](#).

```
CREATE DATABASE "databasename"
```

Where, *databasename* is the name of the database to be created

For example:``sqlCREATE DATABASE "mydatabase"

Use the psql command to migrating PostgreSQL data

This example describes how to use the psql command to restore the PostgreSQL data backup file to the target RDS.

Background information

PostgreSQL supports logical backup. We use the pg_dump logical backup function to export the backup file and then import it to the RDS through psql, thus importing the PostgreSQL data to the

RDS.

Prerequisites

If you haven't created the RDS instance database, please refer to [Configuring the Connection Mode and Creating a Database and an Account](#) before continue.

Preparation of local data

1. Connect to the local PostgreSQL database through the PostgreSQL client.

Run the following command to back up the data.

```
pg_dump -U username -h hostname -p port databasename -f filename
```

Parameters are described as follows:

- username: User name for the local database
- hostname: The local database host name; *localhost* can be used if you log in to the local database host
- port: Local database port number
- databasename: Name of the local database to be backed up
- filename: Name of the backup file to be generated

For example, to back up the local PostgreSQL database, the database user William logs in to the PostgreSQL host and runs the command below to back up data.

```
pg_dump -U William -h localhost -p 3433 pg001 -f pg001.sql
```

Performing migration

Note: The network stability and data security will be improved when data is restored through the RDS Intranet. You are advised to upload the data to the ECS and then restore the data to the target RDS through the Intranet. If the data file is too large, compress it before uploading. This scenario is explained in the following example:

1. Log in to the ECS.

Run the following command through the PostgreSQL client to import the data into the RDS.

```
psql -U username -h hostname -d desintationdb -p port -f dumpfilename.sql
```

Parameters are described as follows:

- username: The PostgreSQL database user name on the RDS
- hostname: The PostgreSQL database address on the RDS
- port: The PostgreSQL database port number on the RDS
- databasename: The PostgreSQL database name on the RDS
- filename: The local backup data file name

For example:

```
psql -U William -h postgresql.rds.aliyuncs.com -d pg001 -p 3433 -f pg001.sql
```

Since the permission configuration of the RDS database is inconsistent with that of the local database, some permission related warnings or errors may occur during data import. They can be ignored, for example:

```
WARNING: no privileges could be revoked for "xxxxx"  
ERROR: role "xxxxx" does not exist
```

Connecting to an instance

An RDS instance can be connected via common methods or Alibaba Cloud DMS. This chapter describes the steps of connecting to an RDS instance.

Prerequisites

If you want to use DMS or a client to access an RDS instance, you must add the corresponding intranet and Internet IP addresses to the RDS white list. For detail, see [Setting a White List](#).

Login via client

This section uses the PostgreSQL client as an example to describe the method for connecting to an instance. You can refer to this method when using other clients.

Note: You are advised to use the psql tool of PostgreSQL client of version 9.4.1 or later to connect to the database; otherwise, some functions may be unavailable due to version mismatch and a warning message similar to the following will appear during connection:

```
WARNING: psql major version 9.3, server major version 9.4.  
Some psql features might not work.
```

Use the PostgreSQL client to run the following command, and enter the password as prompted to connect to the database.

```
psql -U username -h hostname -p port dbname
Password for user myuser:
psql.bin (9.4.4, server 9.4.1)
Type "help" for help.

dbname=>
```

Parameters are described as follows:— u: The initial account user name— h: The instance address— p: The instance port number

- dbname: The name of the database to be connected

For example:

```
psql -U myuser -h extranet4example.pg.rds.aliyuncs.com -p 3433 pg001
```

Appendix: User and schema management

Since superuser is not generally available during use of the RDS, you are advised to create a user separately and manage the user's private space through schema when using the database.

Operation procedure

Note: In this example, myuser is the management account created together with the instance, and newuser is the account to be created at present.

Create a user with the login permission.

```
CREATE USER newuser LOGIN PASSWORD ' password' ;
```

Parameters are described as follows:

- USER: The user name to be created, for example, *newuser*
- password: The password corresponding to the user name, for example, *password*

Create a schema for the new user.

```
CREATE SCHEMA newuser;
GRANT newuser to myuser;
```

```
ALTER SCHEMA myuser OWNER TO newuser;  
REVOKE newuser FROM myuser;
```

Note:

- If newuser is not added to the myuser role before ALTER SCHEMA newuser OWNER TO newuser, the following problem with permission will occur:

```
ERROR: must be member of role "newuser"
```

- In consideration of security, please remove newuser from the myuser role to improve security after the authorization of OWNER is handled.

Use newuser to log in to the database.

```
psql -U newuser -h intranet4example.pg.rds.aliyuncs.com -p 3433 pg001  
Password for user newuser:  
psql.bin (9.4.4, server 9.4.1)  
Type "help" for help.
```