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ApsaraDB for MongoDB

Quick Start for Standalone

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Document conventions

Style	Description	Example
Danger	A danger notice 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.
Warning	A warning notice 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 restart an instance.
Notice	A caution notice indicates warning information, supplementary instructions, and other content that the user must understand.	Notice: If the weight is set to 0, the server no longer receives new requests.
Note	A note indicates supplemental instructions, best practices, tips, and other content.	Note: You can use Ctrl + A to select all files.
>	Closing angle brackets are used to indicate a multi-level menu cascade.	Click **Settings**> **Network**> **Set network type**.
Bold	Bold formatting is used for buttons , menus, page names, and other UI elements.	Click **OK**.
`Courier font`	Courier font is used for commands	Run the `cd /d C:/window` command to enter the Windows system folder.
Italic	Italic formatting is used for parameters and variables.	`bae log list --instanceid` *Instance_ID*
[] or [a|b]	This format is used for an optional value, where only one item can be selected.	`ipconfig [-all|-t]`
{} or {a|b}	This format is used for a required value, where only one item can be selected.	`switch {active|stand}`

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1.Before you start

You can migrate data from a user-created MongoDB database to an ApsaraDB for MongoDB instance. Please pay close attention to the limits of ApsaraDB for MongoDB.

Operation	Limit
Deploy an instance	Standalone instances can only be created in the China (Hangzhou), China (Shanghai), China (Qingdao), China (Beijing), and China (Shenzhen) regions.
Database version	The MongoDB version must be 3.4.
Storage engine	The storage engine must be WiredTiger.
Public connection address	Connecting to ApsaraDB for MongoDB instances over the Internet poses security risks. By default, only a VPC connection address is provided after an instance is activated. If you need to connect to an instance over the Internet, apply for a public endpoint. For more information, see Apply for a public endpoint.
Restart an instance	You must log on to the ApsaraDB for MongoDB console or call the RestartDBInstance operation to restart an instance.
Migrate data	For details about data migration, see Migrate user-created databases to Alibaba Cloud by using tools provided by MongoDB and Migrate user-created standalone MongoDB databases to Alibaba Cloud by using DTS.
Back up data	Standalone instances are backed up in snapshot mode due to their special architecture. Note Snapshot backups retain the state of disk data from a certain time point.
Restore data	You can only create instances based on backup data. For more information, see Create an instance from a backup.
Modify the parameters of an instance	For security and stability purposes, some parameters cannot be modified. For more information, see Configure database parameters for an ApsaraDB for MongoDB instance.

2.ApsaraDB for MongoDB console

The ApsaraDB for MongoDB console is a web application for managing instances. In the ApsaraDB for MongoDB console, you can create and manage instances, configure the instance IP whitelists, passwords, and network types, and perform other operations.

The ApsaraDB for MongoDB console is a part of the Alibaba Cloud Management Console. For more information about general settings and basic operations in the console, see the Alibaba Cloud Management Console.

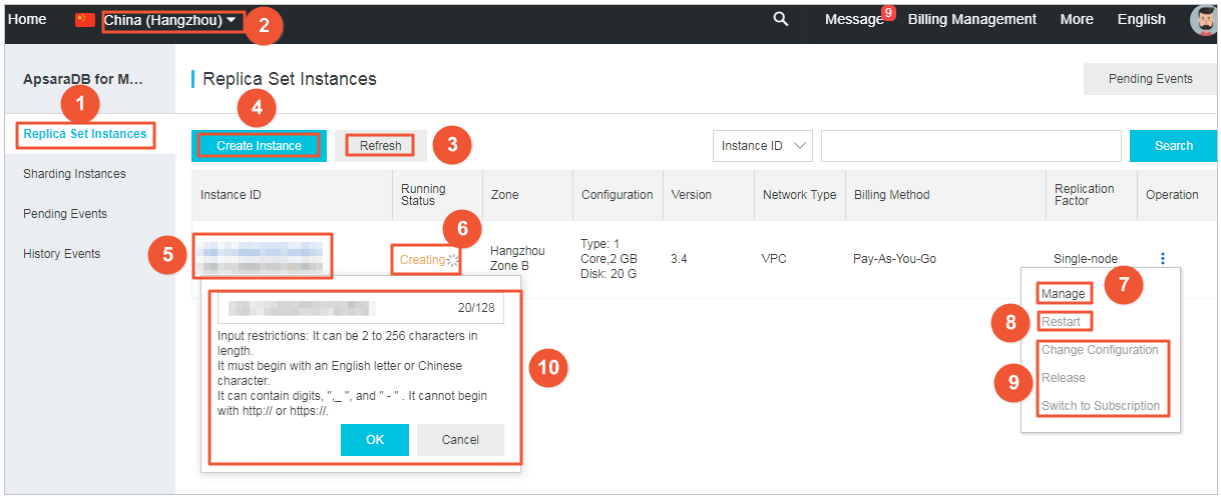
Prerequisites

An Alibaba Cloud account is used. To create an Alibaba Cloud account, go to the Alibaba Cloud official website.

ApsaraDB for MongoDB console homepage

The console homepage displays the same information for all standalone instances.

Log on to the ApsaraDB for MongoDB console and go to the **Instances** page, as shown in the following figure. This figure is only to be used for reference. The actual page may be different.



UI element description

No.	UI element	Description
1	Replica Set Instances	The ApsaraDB for MongoDB console homepage, which displays all standalone o replica set instances in a region that belong to the current account.
2	Region	You can click a region to display all instances that reside within the region.
3	Create Instance	The button to Create a standalone instance.
4	Refresh	The button to refresh the instance information page.
5	Export	The button to Export the list of instances.

No.	UI element	Description
6	Instance ID	You can click an instance ID to go to the Basic Information page of the instance.
7	Status	The status of the instance. Instances may be in different states.
8	Manage	You can click this button to go to the Basic Information page of the instance. On this page, you can view the basic information about the instance, configure instance backup and recovery, view monitoring information, and configure a whitelist.
9	Restart	The button to restart an instance.
10	More	Other buttons, such as Change Configuration and Renew.
11	Edit icon	You can click this icon to modify the instance name. By default, the instance name is identical to the instance ID.

ApsaraDB for MongoDB instance console

Log on to the ApsaraDB for MongoDB console. Click an **Instance ID** or **Manage** in the Actions column corresponding to an instance. The **Basic Information** page is displayed. The following table lists the UI elements on the page.

UI element or page	Section	Description	Operation
Top navigation bar	-	You can migrate, back up, and restart the instance.	• Migrate the data of an instance • Log on to a database • Back up an instance • Restart an instance
Basic Information	Basic Information	You can view the basic information about the instance, such as the instance ID, region, network type, specifications, and disk space. You can also change the configurations of the instance.	Change the configurations of an instance
	Connection Info	You can view the public and internal IP addresses of the instance.	N/A
	Specification Information	You can view the specification details and disk space usage of the instance.	N/A
Accounts	N/A	You can view account information and reset passwords.	Reset a password

UI element or page	Section	Description	Operation
Backup and Recovery	Backups	You can view and download a list of data backups for a specified time period, restore data from the specified time period, or create an instance from a specified backup point.	• Create an instance from a backup
	Backup Settings	You can set a backup policy to automatically and periodically back up data based on the specified backup time.	Configure automatic backup for an instance
Monitoring Info	N/A	You can view the monitoring information of the primary node based on the specified metrics and time range.	View monitoring information
Data Security	Whitelist Settings	You can configure an IP whitelist.	Configure an IP whitelist

3.Use a standalone ApsaraDB for MongoDB instance

This topic describes how to use a standalone ApsaraDB for MongoDB instance, to help you quickly learn how to create an instance, perform basic settings, and connect to a database.

Quick start flowchart

If this is the first time you use ApsaraDB for MongoDB, you can start with Before you start.

The following figure shows all the operations that you need to perform, from purchasing an instance to using it.

1. Create a standalone instance.
2. Set a password for a standalone ApsaraDB for MongoDB instance.
3. Configure a whitelist for a standalone ApsaraDB for MongoDB instance.
4. (Optional)Apply for a public endpoint for a standalone ApsaraDB for MongoDB instance.
5. Connect to and manage a standalone ApsaraDB for MongoDB instance.
   - Connect to a standalone ApsaraDB for MongoDB instance through DMS.
   - Connect to a standalone ApsaraDB for MongoDB instance by using the mongo shell.

4.Create a standalone instance

This topic describes how to create a standalone instance in the ApsaraDB for MongoDB console.

Prerequisites

- An Alibaba Cloud account is registered. For more information, see Sign up with Alibaba Cloud.
- Your account balance is sufficient if you want to create a pay-as-you-go instance.

Billing

For more information, see Billing items and pricing.

Procedure

1. Log on to the ApsaraDB for MongoDB console.
2. In the upper-left corner of the page, select the resource group and the region of the target instance.
3. In the left-side navigation pane, click **Replica Set Instances**.
4. On the **Replica Set Instances** page that appears, click **Create Instance**.
5. Click the **Pay-As-You-Go(Replica Set)** tab.
6. Configure the instance. The following table describes related parameters.

Section	Parameter	Description
Basic Configuration	Region	The region where the ApsaraDB for MongoDB instance is deployed. Standalone instances can only created in the following regions: China (Hangzhou), China (Shanghai), China (Qingdao), China (Beijing), and China (Shenzhen). Note ○ After an instance is created, you cannot change its region. Use caution when you select the region. ○ Only instances in the same region (for example, an ECS instance and a standalone ApsaraDB for MongoDB instance) can communicate with each other inside an internal network.
	Zone	Geographic areas in a region with independent power grids and networks. For more information, see Regions and zones. Note An ECS instance and a standalone ApsaraDB for MongoDB instance in the same zone can be interconnected over an internal network with the minimum network latency.

Section	Parameter	Description
	Database Version	Standalone instances support MongoDB 3.4. Select **MongoDB 3.4**.
	Storage Engine	The storage engine is **WiredTiger**.
	Replication Factor	Select **Single Node**.
Network Type	VPC	A VPC is an isolated network with higher security and performance than a classic network. **Note** You must create a VPC in advance. For more information, see Create a VPC.
Specifications	Specification	○ The CPU and memory occupied by the instance. ○ The maximum number of connections and maximum IOPS vary depending on different specifications. The maximum IOPS is measured for read and write operations separately, and the maximum sum of read and write operations can be twice the maximum IOPS. For more information, see Instance types.
	Storage Space	The storage space of the instance. **Note** The storage space stores your data, system files, and log files.
Set Password	○ Set Now ○ Set Later	The password of the root user. You can set a password immediately or reset it during the running of the instance. For more information, see Set a password. ○ The password must contain at least three of the following character types: uppercase letters, lowercase letters, digits, and special characters. Special characters include #$%^&*()_+-= ○ The password must be 8 to 32 characters in length.
Quantity	Duration	Pay-as-you-go: Select the quantity for pay-as-you-go instances to be purchased with the same configuration. You can select an integer in the range of 1 to 10. **Note** The billing method of standalone instances must be pay-as-you-go.
	Quantity	

7. Click **Buy Now** to go to the **Confirm Order** page.

8. On the **Confirm Order** page that appears, read and select **ApsaraDB for MongoDB Agreement of Service** and follow the instructions to complete the payment process.

View the created instance

1. Log on to the ApsaraDB for MongoDB console.
2. In the upper-left corner of the page, select the resource group and the region of the target instance.
3. In the left-side navigation pane, click **Replica Set Instances**.

Troubleshoot if you cannot find the instance

Possible causes	Solution
You selected the wrong region in the console.	Select the region where the instance is deployed. For more information, see View the created instance.
You opened the incorrect page.	In the left-side navigation pane, click **Replica Set Instances**. For more information, see View the created instance.
The instance list in the ApsaraDB for MongoDB console is not updated or updated before the instance is created.	Wait for several minutes and then update the instance list to check whether the instance is added to the list.
Resources are insufficient.	The system may fail to create the instance due to insufficient resources. In this case, your payment is refunded. You can check the refund on the Orders page. After you confirm the refunded fees, you can try to create the instance in another zone. You can also submit a ticket.

What's next

After you create an instance, you must configure a whitelist (for more information, see Configure a whitelist for a standalone ApsaraDB for MongoDB instance). If you want to connect to the instance over the Internet, you must apply for a public endpoint (for more information, see Apply for a public endpoint for a standalone ApsaraDB for MongoDB instance).

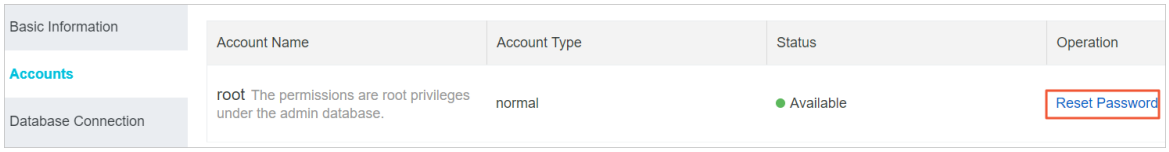
For more information about instance connection methods and connection scenarios, see Connect to an ApsaraDB for MongoDB instance.

5.Set a password for a standalone ApsaraDB for MongoDB instance

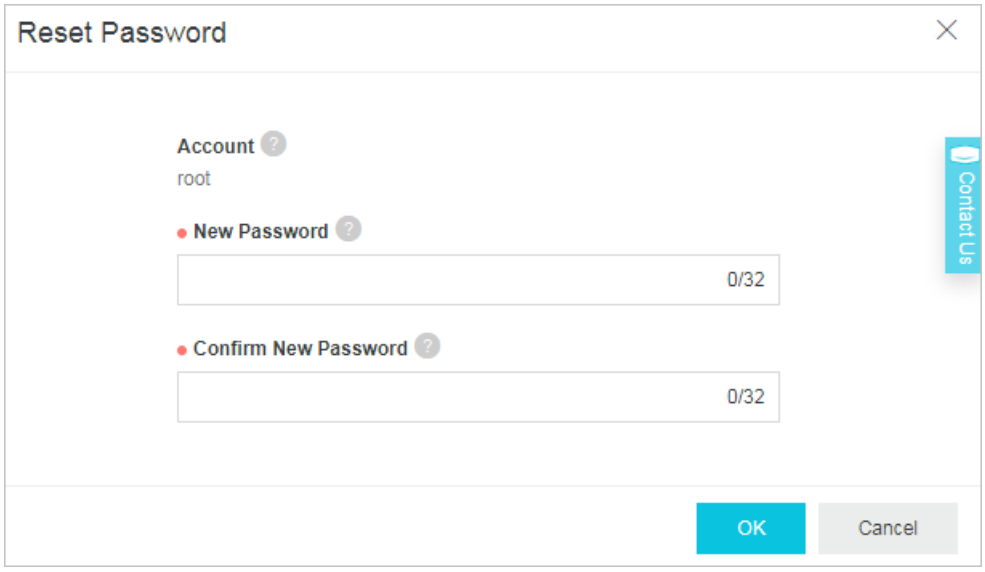
This topic describes how to set or reset a password for a standalone ApsaraDB for MongoDB instance if you did not set the password when you created the instance, want to change the password, or forget the password.

Procedure

1. Log on to the ApsaraDB for MongoDB console.
2. In the upper-left corner of the page, select the resource group and the region of the target instance.
3. In the left-side navigation pane, click **Replica Set Instances**.
4. Find the target instance and click its ID.
5. In the left-side navigation pane, click **Accounts**.
6. Click **Reset Password**.



7. In the **Reset Password** dialog box that appears, enter and confirm the new password. Click **OK**.



> **Note**
>
> - The password must contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters. Special characters include ! # $ % ^ & * ( ) _ + - =
> - The password must be 8 to 32 characters in length.

6.Configure a whitelist for a standalone ApsaraDB for MongoDB instance

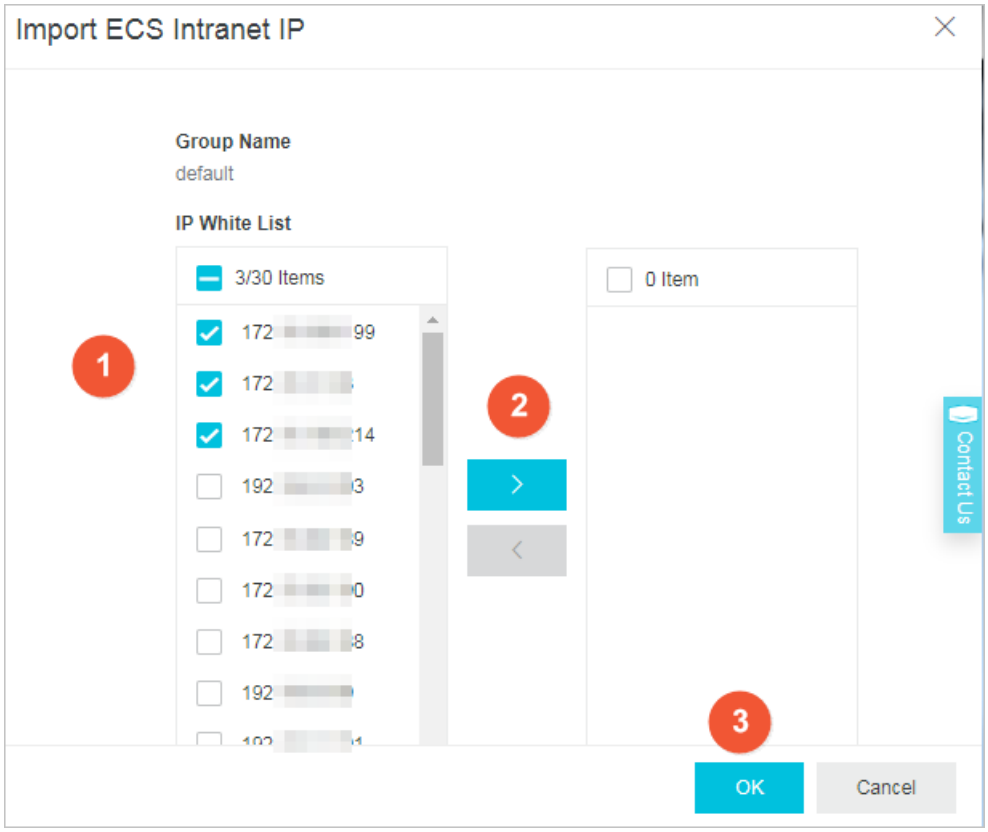
This topic describes how to configure a whitelist for a standalone ApsaraDB for MongoDB instance. Only the devices whose IP addresses are added to the whitelists of the instance are allowed to access the instance. The default whitelist only contains the IP address 127.0.0.1, which indicates that no devices can connect to the instance.

Context

- You must configure a whitelist upon the first use of an instance. After the whitelist is configured, the connection address of the instance is displayed on the **Basic Information** and **Database Connection** pages.
- Proper configuration of the whitelists can enhance access security of ApsaraDB for MongoDB. We recommend that you regularly maintain the whitelist.

Procedure

1. Log on to the ApsaraDB for MongoDB console.
2. In the upper-left corner of the page, select the resource group and the region of the target instance.
3. In the left-side navigation pane, click **Replica Set Instances**.
4. Find the target instance and click its ID.
5. In the left-side navigation pane, choose **Data Security > Whitelist Settings**.
6. Click the ⋮ icon in the **Actions** column, and select **Manually Modify** or **Import ECS Intranet IP**.
   - Click **Manually Modify**. In the dialog box that appears, enter an IP address or CIDR block, and click **OK**.
   - Click **Import ECS Intranet IP**. In the dialog box that appears, the internal IP addresses of the ECS instances of your Alibaba Cloud account are displayed. You can select the desired IP addresses, add them to a whitelist, and click **OK**.



Note

- If a whitelist contains more than one IP address, separate them with commas (,). Every IP address in a whitelist must be unique. A whitelist can contain a maximum of 1,000 IP addresses.

  Supported formats include 0.0.0.0/0, 10.23.12.24 (single IP address), and 10.23.12.24/24. 10.23.12.24/24 is a CIDR notation (for more information, see CIDR blocks), in which the suffix /24 indicates the number of bits for the prefix of the IP address. The prefix consists of 1 to 32 bits.

- If the value is 0.0.0.0/0 or empty, the ApsaraDB for MongoDB instance can be accessed by all IP addresses. In this situation, the database is at high security risk.

More operations

- Add an ECS security group
- Delete an IP whitelist or an ECS security group

Common connection scenarios

- Connect a local client to an ApsaraDB for MongoDB instance over the Internet
- How to connect an ECS instance to an ApsaraDB for MongoDB instance when their network types are different
- How to connect an ECS instance to an ApsaraDB for MongoDB instance when they are in different regions
- How to connect an ECS instance to an ApsaraDB for MongoDB instance when they do not

belong to the same Alibaba Cloud account

Result

After a whitelist is configured, the VPC connection address of the instance is displayed on the **Basic Information** and **Database Connection** pages.

7.Apply for a public endpoint for a standalone ApsaraDB for MongoDB instance

This topic describes how to apply for a public endpoint for a standalone ApsaraDB for MongoDB instance when you want to connect to this instance over the Internet.

Context

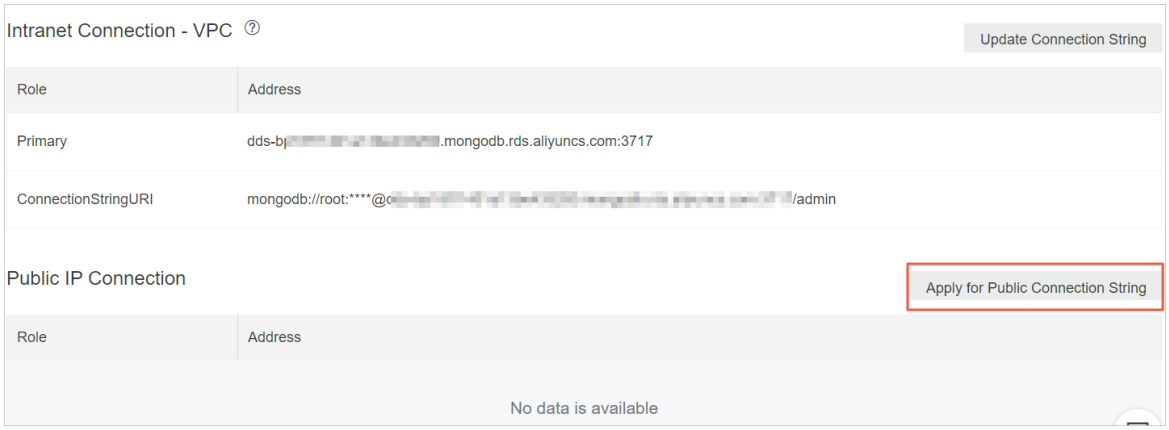
The following table describes the connections supported by a standalone ApsaraDB for MongoDB instance.

Address type	Description
VPC connection address	• A VPC is an isolated virtual network with better security and performance than a classic network. • By default, an ApsaraDB for MongoDB instance provides VPC connection addresses.
Public connection address	• By default, ApsaraDB for MongoDB instances do not provide public connection addresses because connecting to instances over the Internet poses security risks. • If you want to connect to an ApsaraDB for MongoDB instance from a device outside of Alibaba Cloud (such as a local device), you must apply for a public endpoint.

Procedure

> **Note** To ensure data security, promptly release public connection addresses you no longer need. For more information, see Release a public connection address.

1. Log on to the ApsaraDB for MongoDB console.
2. In the upper-left corner of the page, select the resource group and the region of the target instance.
3. In the left-side navigation pane, click **Replica Set Instances**.
4. Find the target instance and click its ID.
5. In the left-side navigation pane, click **Database Connection**.
6. Click **Apply for Public Connection String** on the right of **Public IP Connection**.



7. In the dialog box that appears, click **OK**.

> **Note** If you want to connect to an instance by using a requested public endpoint, you must add the public IP address of the device that connects to the instance to a whitelist of the instance. For more information, see Configure a whitelist.

References

Connect a local client to an ApsaraDB for MongoDB instance over the Internet

8.Connect to an instance

8.1. Connect to a standalone ApsaraDB for MongoDB instance through DMS

Data Management (DMS) is an integrated database solution that offers data management, structure management, user authorization, security auditing, data trend analysis, data tracking, BI charts, performance optimization, and server management. You can use DMS to connect to a standalone ApsaraDB for MongoDB instance for easy management.

Preparations

Add the IP address of the DMS server (100.104.0.0/16) to the whitelist of the ApsaraDB for MongoDB instance. For more information, see Configure a whitelist for a standalone ApsaraDB for MongoDB instance.

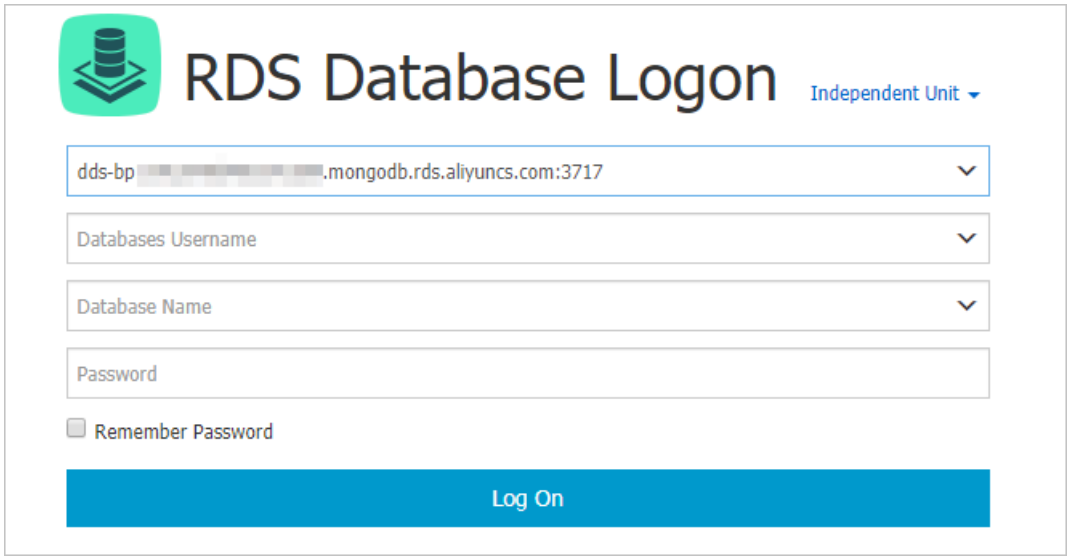
> **Note** Skip this step if you have added the IP address of the DMS server to the whitelist of the ApsaraDB for MongoDB instance.

Procedure

1. Log on to the ApsaraDB for MongoDB console.
2. In the upper-left corner of the page, select the resource group and the region of the target instance.
3. In the left-side navigation pane, click **Replica Set Instances**.
4. Find the target instance and click its ID.
5. Click **Log On** and select **Primary** or **Secondary** in the upper-right corner of the Basic Information page . You are redirected to the **DMS console**.

   > **Note**
   > - Primary: the primary node of the replica set instance. This node has read/write permissions on the database.
   > - Secondary: the secondary node of the replica set instance. This node only has read permissions on the database.

6. In the **DMS console**, enter the following information.



Item	Description
Network address:Port	The internal connection string of the primary node of the ApsaraDB for MongoDB instance is automatically entered.
Database Username	Enter the database account of the MongoDB instance. The initial account is root.
Database Name	Enter the name of the database to which the account belongs. **Note** ◦ If **Database Username** is set to root, the database name is admin. ◦ We do not recommend that you log on to a database as the root user in the production environment. You can create users and grant permissions based on your business needs. For more information, see Use DMS to manage ApsaraDB for MongoDB users.
Password	The password of the specified account. **Note** If you forget the password of the root account, you can reset the password by using the method specified in Set a password.

7. Click **Log On**.

Common connection scenarios

- Connect a local client to an ApsaraDB for MongoDB instance over the Internet
- How to connect an ECS instance to an ApsaraDB for MongoDB instance when their network types are different
- How to connect an ECS instance to an ApsaraDB for MongoDB instance when they are in different regions

- How to connect an ECS instance to an ApsaraDB for MongoDB instance when they do not belong to the same Alibaba Cloud account

FAQ

- How to troubleshoot logon issues for the mongo shell
- How to troubleshoot database connection failures after the number of connections reaches the upper limit
- Troubleshoot high CPU utilization of ApsaraDB for MongoDB
- How to query and limit the number of connections

8.2. Connect to a standalone ApsaraDB for MongoDB instance by using the mongo shell

This topic describes how to connect to a standalone ApsaraDB for MongoDB instance by using the mongo shell, which is a database management tool built in MongoDB. You can install the mongo shell on your client or in an ECS instance.

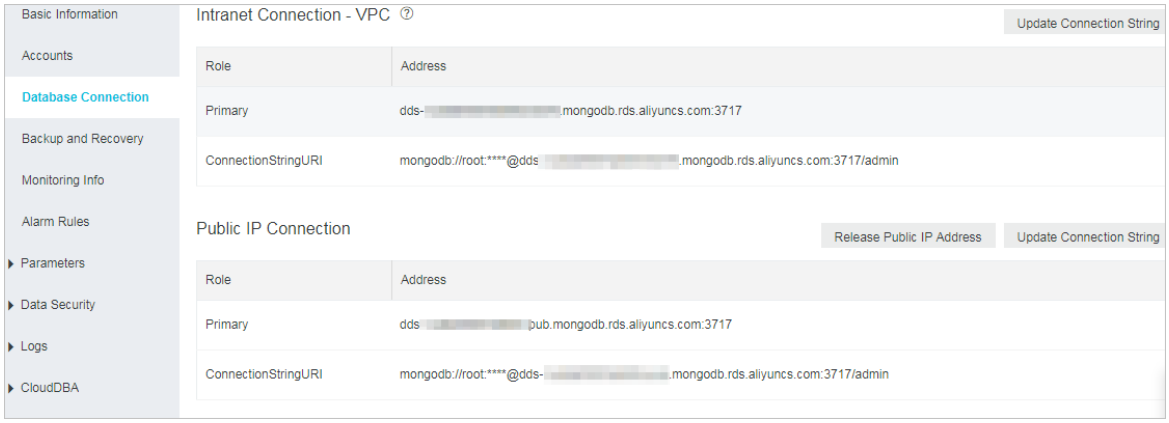
Prerequisites

- Mongo shell 3.0 or later is installed to ensure successful authentication. For more information about the installation process, visit Install MongoDB at the official MongoDB website.
- The IP address of your client is added to a whitelist of the ApsaraDB for MongoDB instance. For more information, see Configure a whitelist for a standalone ApsaraDB for MongoDB instance.

> **Note** If you want to connect to the instance over the Internet, you must apply for a public endpoint.

Procedure

1. Log on to the ApsaraDB for MongoDB console.
2. In the upper-left corner of the page, select the resource group and the region of the target instance.
3. In the left-side navigation pane, click **Replica Set Instances**.
4. Find the target instance and click its ID.
5. In the left-side navigation pane, click **Database Connection** to obtain the connection addresses of the primary node.



Database connection information

Item	Description
Address type	○ VPC connection address: A VPC is an isolated virtual network with better security and performance than a classic network. By default, an ApsaraDB for MongoDB instance provides VPC connection addresses. ○ Public connection address: By default, ApsaraDB for MongoDB instances do not provide public connection addresses because connecting to instances over the Internet poses security risks. If you want to connect to an ApsaraDB for MongoDB instance from a device outside of Alibaba Cloud (such as a local device), you must apply for a public endpoint. For more information, see Apply for a public endpoint for a standalone ApsaraDB for MongoDB instance.
Role	Primary: indicates the primary node of the ApsaraDB for MongoDB instance. You can connect to this node to perform read/write operations on the database.
Connection string of the primary node	The address of the primary node is in the format of `<host>:<port>`. **Note** ○ <host>: the endpoint of the primary node. ○ <port>: the service port of the primary node.

Item	Description
Connection string URI	The connection string URI is in the following format: `mongodb://[username:password@]host1[:port1][,host2[:port2],...[,hostN[:portN]]][/[database][? options]]` ○ mongodb://: the prefix, indicating a connection string URI. ○ username:password@: the username and password used to connect to the ApsaraDB for MongoDB instance. Separate them with a colon (:). ○ hostX:portX: the endpoint and port number of the instance. ○ /database: the name of the authentication database. It is the database where the database account is created. ○ ? options: additional connection options.

6. Run the following command on the local server or ECS instance where the mongo shell is installed to connect to the database:

```
mongo --host <host:port> -u <username> -p --authenticationDatabase <database>
```

> **Note**
> - <host:port>: the connection string of the primary node, including the endpoint and port number.
> - <username>: the database account of the ApsaraDB for MongoDB instance. The initial account is root. We recommend that you do not log on to a database as the root user in the production environment. You can create users and grant permissions based on your business needs. For more information, see Manage MongoDB users though DMS.
> - <database>: the name of the authentication database. It is the database where the database account is created. If the database account is root, enter admin.

Example:

```
mongo --host dds-bpxxxxxxxxxx.mongodb.rds.aliyuncs.com:3717 -u root -p --authenticationDatabase admin
```

7. When `Enter password:` is displayed, enter the password for the database user and press Enter. If you forgot the password for the root user, you can reset it. For more information, see Set a password.

> **Note** The password you enter is not displayed.

Common connection scenarios

- Connect a local client to an ApsaraDB for MongoDB instance over the Internet
- How to connect an ECS instance to an ApsaraDB for MongoDB instance when their network types are different
- How to connect an ECS instance to an ApsaraDB for MongoDB instance when they are in different regions
- How to connect an ECS instance to an ApsaraDB for MongoDB instance when they do not belong to the same Alibaba Cloud account

FAQ

- How to troubleshoot logon issues for the mongo shell
- How to troubleshoot database connection failures after the number of connections reaches the upper limit
- How to troubleshoot high CPU utilization of ApsaraDB for MongoDB
- How to query and limit the number of connections

9.Data migration

9.1. Migrate user-created standalone MongoDB databases to Alibaba Cloud by using DTS

This topic describes how to use Data Transmission Service (DTS) to migrate data from standalone user-created MongoDB databases to Alibaba Cloud. DTS supports full data migration and incremental data migration.

To migrate all data without service interruption, you can select both full data migration and incremental data migration. You can also use the built-in commands of MongoDB to migrate user-created MongoDB databases. For more information, see Migrate user-created databases to Alibaba Cloud by using tools provided by MongoDB.

For more information about data migration or synchronization solutions, see Overview.

Prerequisites

- The version of the user-created MongoDB database is 4.2, 4.0, 3.0, 3.2, or 3.4.
- The storage space of the ApsaraDB for MongoDB instance is larger than the size of the user-created MongoDB database.

Precautions

- To avoid service disruptions, we recommend that you migrate data during off-peak hours.
- If the source user-created MongoDB database and the destination ApsaraDB for MongoDB instance run different MongoDB versions or storage engines, ensure that your applications can run on both databases. For more information about MongoDB versions and storage engines that are supported by ApsaraDB for MongoDB, see MongoDB versions and storage engines.
- To migrate incremental data from a standalone user-created MongoDB database, you must enable the oplog feature for the database. For more information, see Preparations for incremental data migration.

Billing

Migration type	Instance configurations	Internet traffic
Full data migration	Free of charge.	Charged only when data is migrated from Alibaba Cloud over the Internet. For more information, see Pricing.
Incremental data migration	Charged. For more information, see Pricing.	

Migration types

- Full data migration: All historical data in the source MongoDB database is migrated to the destination MongoDB database.

> **Note** Data migration is supported at the database, collection, and index levels.

- Incremental data migration: After full data migration, incremental data is synchronized to the destination MongoDB database.

> **Note**
> - The create and delete operations for databases, collections, and indexes can be synchronized.
> - The create, delete, and update operations for documents can also be synchronized.

Permissions required for database accounts

Database	Full data migration	Incremental data migration
Source user-created MongoDB database	Read permissions on the source database	Read permissions on the source database, admin database, and local database
Destination ApsaraDB for MongoDB instance	Read/write permissions on the destination database	Read/write permissions on the destination database

For more information about how to create and authorize a database account:

- Create User for MongoDB for a user-created MongoDB database
- Manage MongoDB users though DMS for an ApsaraDB for MongoDB instance

Preparations for incremental data migration

Before you use DTS to migrate incremental data, enable the oplog feature for the source database. If you only perform full data migration, skip the following steps.

> **Note** This operation restarts the MongoDB database. We recommend that you perform this operation during off-peak hours.

1. Use Mongo Shell to connect to the user-created MongoDB database.
2. Run the following commands to shut down the MongoDB database:

```
use admin
db.shutdownServer()
```

3. Run the following command to start the MongoDB database in the background as a replica set:

```
mongod --port 27017 --dbpath /var/lib/mongodb --logpath /var/log/mongodb/mongod.log --replSet rs0 --bind_ip 0.0.0.0 --auth --fork
```

> **Note**
>
> - In this command, */var/lib/mongodb* is the database path, and */var/log/mongodb/mongod.log* is the log file path. Specify the paths based on business needs.
> - This command uses 0.0.0.0 as the associated IP address of the MongoDB database. This allows you to access the database by using all IP addresses. After the migration is complete, run the `kill` command to end the process, and start the MongoDB database by using the original configuration file.
> - This command enables authentication. You can only access the database after you pass the authentication.

4. Use Mongo Shell to reconnect to the user-created MongoDB database.
5. Run the following commands to initialize the replica set:

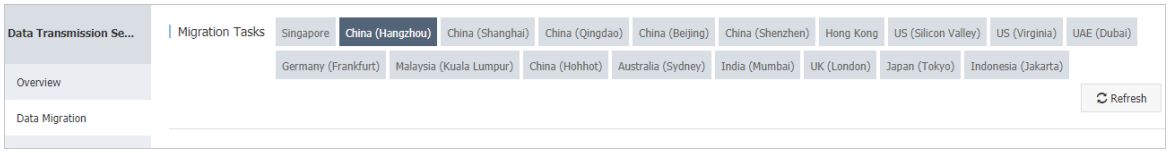
```
use admin
rs.initiate()
```

6. The role of the current node changes to primary.

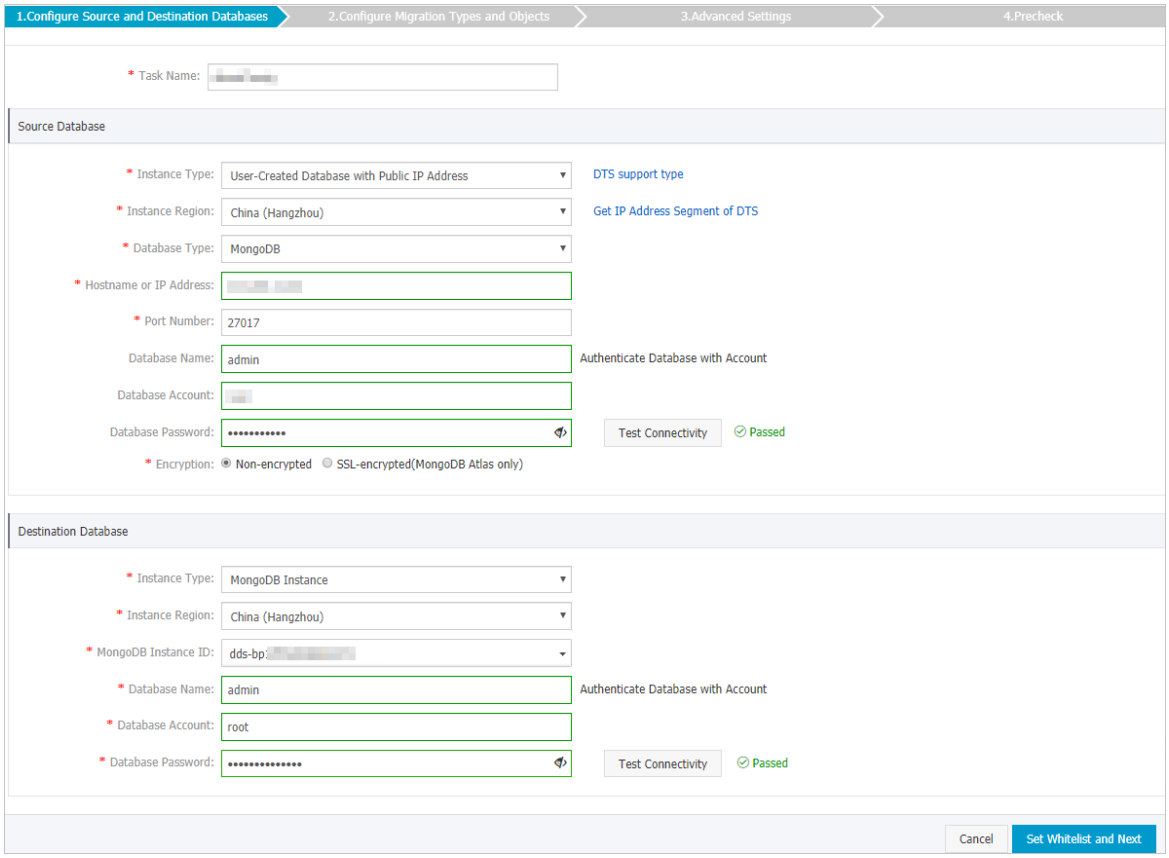
> **Note** You can run the `rs.printReplicationInfo()` command to view the status of oplog.

Procedure

1. Log on to the DTS console.
2. In the left-side navigation pane, click **Data Migration**.
3. In the **Migration Tasks** section, select the region in which the ApsaraDB for MongoDB instance resides.



4. In the upper-right corner, click **Create Migration Task**.
5. Configure the source and destination databases.



Section	Parameter	Description
N/A	Task name	DTS automatically generates a task name. We recommend that you specify an informative name for easy identification. You do not need to use a unique task name.
	Instance Type	Select an instance type based on the location where the database is deployed. In this topic, a **User-Created Database with Public IP Address** is used as an example. **Note** If you select other instance types, you must prepare the environments that are required for the source database. For more information, see Preparation overview.
	Instance Region	If Instance Type is set to **User-Created Database with Public IP Address**, you do not need to specify the **Instance Region** parameter. **Note** If you have configured a whitelist for the user-created MongoDB database, you must add the CIDR blocks of DTS servers to the whitelist. You can click **Get IP Address Segment of DTS** next to **Instance Region** to obtain the CIDR blocks of DTS servers.

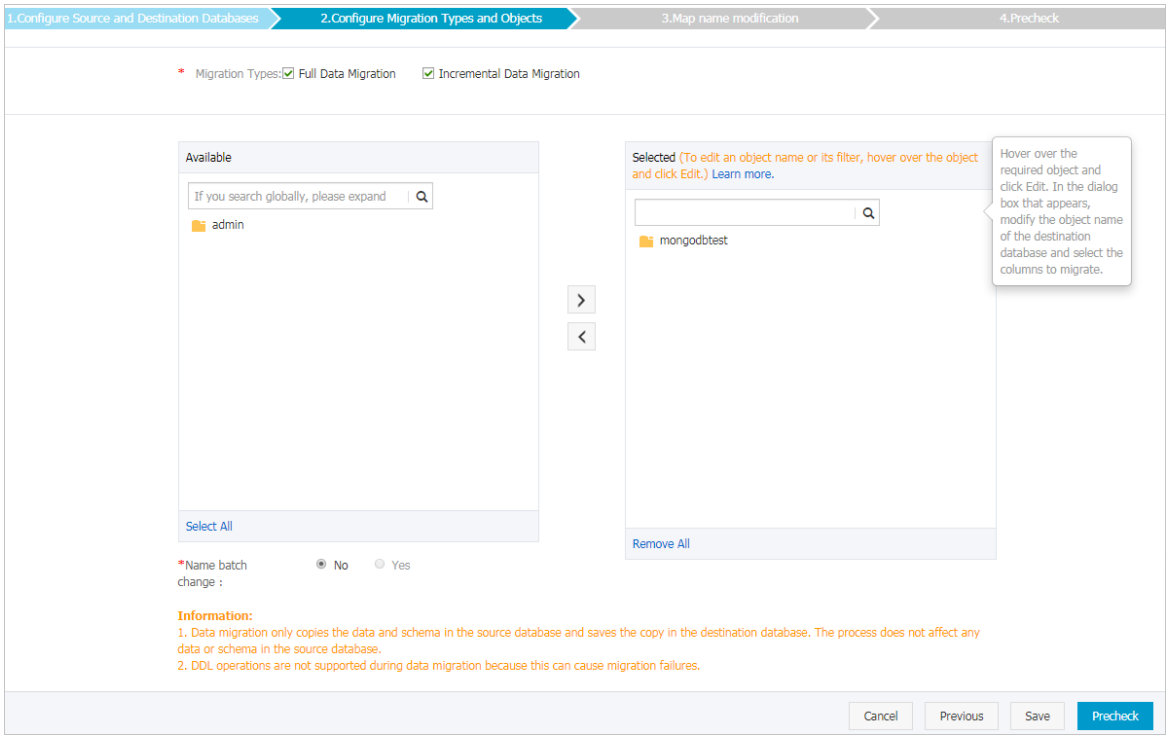
Section	Parameter	Description
Source Database	Database Type	Select **MongoDB**.
	Hostname or IP Address	Enter the endpoint that is used to connect to the user-created MongoDB database. In this example, enter the public IP address.
	Port Number	Enter the service port of the user-created MongoDB database. **Note** In this example, the service port of the user-created MongoDB database must be open to the public network.
	Database Name	Enter the name of the authentication database to which the database account belongs.
	Database Account	Enter the username of the database account that you use to manage the source database. For more information about the permissions that are required for the account, see Permissions required for database accounts.
	Database Password	Enter the password of the database account. **Note** After you specify the source database information, click **Test Connectivity** next to **Database Password** to check whether the information is correct. If the information is correct, the **Passed** message is displayed. If the **Failed** message is displayed, you can click **Check** next to the **Failed** message to modify the information as prompted.
	Connection Method	Select **Non-encrypted**. **Note** The **SSL-encrypted** option is available only when you migrate MongoDB Atlas.
	Instance Type	Select **MongoDB Instance**.
	Instance Region	Select the region in which the destination ApsaraDB for MongoDB instance resides.
	MongoDB Instance ID	Select the ID of the destination ApsaraDB for MongoDB instance.

Section	Parameter	Description
Destination Database	Database Name	Enter the name of the authentication database to which the database account belongs. Note If you want to use the root account, specify admin for the Database Name parameter.
	Database Account	Enter the username of the database account that you use to manage the destination database. For more information about the permissions that are required for the account, see Permissions required for database accounts.
	Database Password	Enter the password of the database account. Note After you specify the destination database information, click Test Connectivity next to Database Password to check whether the information is correct. If the information is correct, the Passed message is displayed. If the Failed message is displayed, click Check next to the Failed message to modify the information as prompted.

6. In the lower-right corner of the page, click **Set Whitelist and Next**.

   Note The CIDR blocks of DTS servers are automatically added to the whitelist of the destination RDS instance. This ensures that DTS servers can connect to the destination ApsaraDB for MongoDB instance. After the migration is completed, you can remove these CIDR blocks from the whitelist. For more information, see Configure a whitelist for a replica set instance.

7. Configure migration types and objects to be migrated.



Parameter	Description
Migration Types	○ To perform only full data migration, select **Full Data Migration**. ○ To migrate data with minimal downtime, select both **Full Data Migration** and **Incremental Data Migration**. **Note** ■ Before migrating incremental data from a standalone user-created MongoDB database, you must enable oplog for the database. For more information, see Preparations for incremental data migration. ■ If the **Incremental Data Migration** option is not selected, do not write new data to the user-created MongoDB database when full data migration is in progress. Otherwise, data inconsistency may occur.

Parameter	Description
Migration objects	○ Select objects from the **Available** section and click the icon to move the objects to the **Selected** section. **Note** ■ Data in the admin and local databases cannot be migrated. ■ The config database is an internal database. We recommend that you do not migrate data in the config database. ○ A migration object can be a database, collection, or function. ○ By default, the name of an object remains unchanged after migration. You can change the names of the objects in the destination RDS instance by using the object name mapping feature. For more information, see Object name mapping.

8. In the lower-right corner of the page, click **Precheck**.

   Note
   - Before you can start the data migration task, a precheck is performed. You can start the data migration task only after the task passes the precheck.
   - If the task fails to pass the precheck, click the icon next to each failed item to view details. Troubleshoot the issues based on the causes and run the precheck again.

9. After the task passes the precheck, click **Next**.
10. In the **Confirm Settings** dialog box, specify the **Channel Specification** parameter and select **Data Transmission Service (Pay-As-You-Go) Service Terms**.
11. Click **Buy and Start** to start the migration task.
    - Full data migration

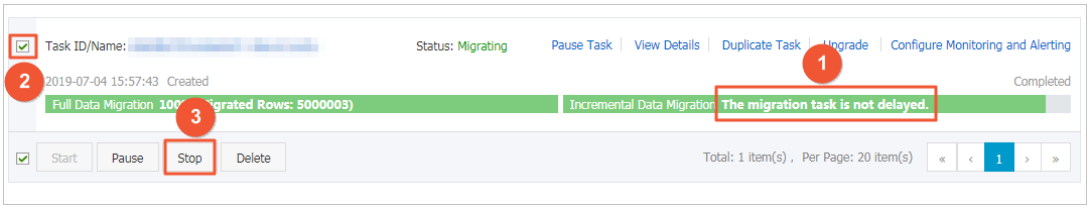
      Do not manually stop a task during full data migration. Otherwise, the system may fail to perform a full data migration. Wait until the data migration task automatically stops.
    - Incremental data migration

      An incremental data migration task does not automatically stop. You must manually stop the migration task.

      Note Select an appropriate time to manually stop the migration task. For example, you can stop the migration task during off-peak hours or before you switch your workloads to the destination instance.

a. Wait until **Incremental Data Migration** and **The migration task is not delayed** appear in the progress bar of the migration task. Then, stop writing data to the source database for a few minutes. The delay time of **incremental data migration** may be displayed in the progress bar.

b. After the status of **Incremental Data Migration** changes to **The migration task is not delayed**, stop the migration task.



12. Switch your workloads to the ApsaraDB for MongoDB instance.

9.2. Migrate user-created databases to Alibaba Cloud by using tools provided by MongoDB

mongodump and mongorestore are both built in MongoDB for backup and restoration. You can install the MongoDB database on a local device or ECS instance and use mongodump and mongorestore to migrate a user-created MongoDB database to an ApsaraDB for MongoDB instance.

We recommend that you use DTS to migrate user-created MongoDB databases to Alibaba Cloud, which ensures data migration without service downtime. For more information, see Migrate user-created standalone MongoDB databases to Alibaba Cloud by using DTS.

For more data migration and synchronization solutions, see Overview.

Prerequisites

- The version of mongodump and mongorestore is the same as that of the user-created MongoDB database. For more information about the installation procedure, visit Install MongoDB at the official MongoDB website.

  > **Note** You can also run the mongodump and mongorestore commands on the server where the user-created MongoDB databases reside.

- Standalone ApsaraDB for MongoDB instances only support MongoDB 3.4. To ensure compatibility, the version of the user-created MongoDB database must be 3.0, 3.2, 3.4, 4.0, or 4.2 .

  > **Note** If the source user-created MongoDB databases and the destination ApsaraDB for MongoDB instance run different database versions or storage engines, ensure that there are no compatibility issues between them before you start migration. For more information about the database versions and storage engines supported by ApsaraDB for MongoDB, see MongoDB versions and storage engines.

- The storage space of the standalone ApsaraDB for MongoDB instance must be larger than that required by the user-created MongoDB database. If the storage space is insufficient, you can expand the storage space. For more information, see Configuration change overview.

Precautions

- This is full data migration. To ensure data consistency, stop related services and data writing operations on the source MongoDB database before the migration starts.
- If you have run the mongodump command to back up the database, move the backup files in the *dump* folder to another directory. Ensure that the *dump* folder is empty. Otherwise, the historical backup files in this folder is overwritten during data backup.
- Run the mongodump and mongorestore commands on the server where the user-created MongoDB database resides. Do not run them in the mongo shell.

Step 1: Back up the user-created database

1. On the server where the user-created database resides, run the following command to back up the whole data:

   ```
   mongodump --host <mongodb_host> --port <port>  -u <username>  --authenticationDatabase  <database>
   ```

   > **Note**
   > - <mongodb_host>: the server address of the user-created MongoDB database. If this database is deployed on the current server, set this parameter to 127.0.0.1.
   > - <port>: the service port number for the user-created database. The default port number is 27017.
   > - <username>: the account used to log on to the user-created MongoDB database.
   > - <database>: the name of the authentication database. It is the database where the database account is created.

   Example:

   ```
   mongodump --host 127.0.0.1 --port 27017 -u root --authenticationDatabase admin
   ```

2. Enter the password for the database user in the `Enter password:` prompt and press Enter to start the backup.

   > **Note** The password you enter is not displayed.

Wait until the data backup is complete. The data of the user-created database is backed up in the *dump* folder of the current directory.

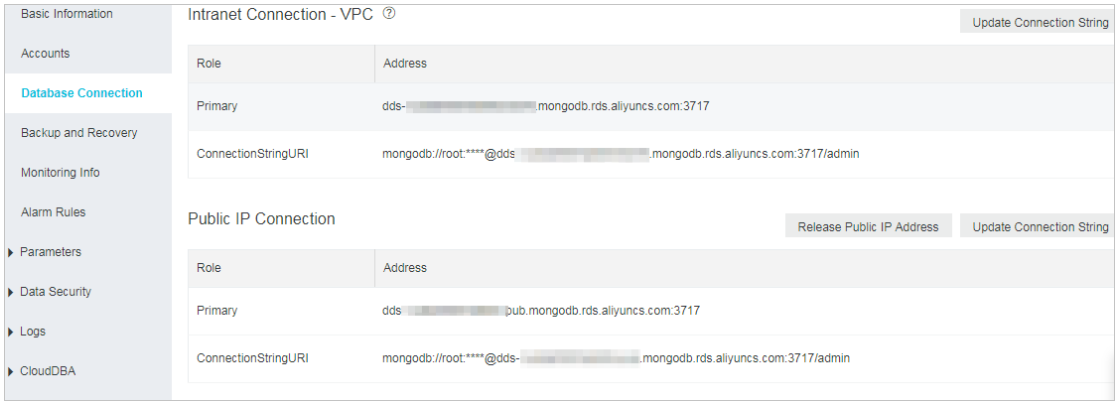
Step 2: Migrate data to the ApsaraDB for MongoDB instance

1. Obtain the connection address of the primary node of the ApsaraDB for MongoDB instance.
   i. Log on to the ApsaraDB for MongoDB console.
   ii. In the upper-left corner of the page, select the region where your instance resides.

iii. In the left-side navigation pane, click **Replica Set Instances**.

iv. Find the target instance and click its ID.

v. In the left-side navigation pane, click **Database Connection** to view the database connection details.



Connection addresses

Address type	Description	Application scenario
VPC connection address	A VPC is an isolated virtual network with better security and performance than a classic network.	The user-created MongoDB database is deployed on the ECS instance. **Note** The ECS instance and ApsaraDB for MongoDB instance must be located in the same region and VPC.
Public connection address	By default, ApsaraDB for MongoDB instances do not provide public connection addresses. You need to apply for a public endpoint if required. For more information, see Apply for a public endpoint.	The user-created MongoDB database is deployed on a local device.

2. Add the IP address of the server where the user-created database resides to a whitelist of the ApsaraDB for MongoDB instance. For more information, see Configure a whitelist.

Note

- When you connect to an ApsaraDB for MongoDB instance over a VPC, you must add the internal IP address of the ECS instance where the user-created database resides to the whitelist of the ApsaraDB for MongoDB instance.
- When you connect to an ApsaraDB for MongoDB instance over the Internet, you must add the public IP address of the local server where the user-created database resides to a whitelist of the ApsaraDB for MongoDB instance.

3. On the server where the user-created database resides, run the following command to

migrate the whole data to the ApsaraDB for MongoDB instance:

```
mongorestore --host <Primary_host>  -u <username> --authenticationDatabase <database> <Backup directory>
```

> **Note**
>
> - <Primary_host>: the connection address of the primary node in the ApsaraDB for MongoDB instance.
> - <username>: the database account of the ApsaraDB for MongoDB instance. The initial account is root.
> - <database>: the name of the authentication database. It is the database where the database account is created. If the database account is root, enter admin.
> - <Backup directory>: the directory that stores backup files. The default backup directory is *dump*.

Example:

```
mongorestore --host dds-bp**********-pub.mongodb.rds.aliyuncs.com:3717 -u root --authenticationDatabase admin dump
```

4. Enter the password for the database user of the ApsaraDB for MongoDB instance in the `Enter password:` prompt and press Enter to start data migration.

> **Note**
>
> - The password you enter is not displayed.
> - If you forget the password for the root user, you can reset it. For more information, see Set a password.

Wait until the data migration is complete. Switch your business to the ApsaraDB for MongoDB instance during off-peak hours.

References

After the database is migrated to an ApsaraDB for MongoDB instance, you can connect to the database and manage the database and database account.

- Connect to a standalone ApsaraDB for MongoDB instance by using the mongo shell
- Manage MongoDB users though DMS