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ServerMigrationCenter

Best Practices

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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}`

Table of Contents

1.Overview

This topic describes the best practices for using Server Migration Center (SMC) in various different scenarios.

Background information

SMC is a migration platform that is developed by Alibaba Cloud. You can use SMC to migrate data from your servers to Alibaba Cloud. SMC provides multiple features and benefits to simplify data migration. For more information, see What is SMC?.

Scenarios

You can use SMC to migrate data in the following scenarios:

- If you migrate data from a server to Alibaba Cloud for the first time, we recommend that you perform a full migration. For more information, see Migration process.
- If you need to synchronize data changes from a server to Alibaba Cloud, we recommend that you perform an incremental migration. For more information, see Migrate incremental data from a source server.
- If you need to migrate data from multiple servers, import the information of the servers to SMC, and then import migration tasks in batches. For more information, see Import multiple migration tasks by using an Excel template.
- You can estimate the migration duration and the data transfer rate. For more information, see Estimate the time required for migration and test the transmission speed.
- You can enable multi-threaded transfer acceleration to maximize bandwidth utilization. This allows you to improve your transmission efficiency in high-bandwidth scenarios. For more information, see Enable multi-threaded transfer acceleration.
- If your server can access a VPC in the destination region of data migration, we recommend that you connect the server to the VPC. When you create a migration task, select VPC as the network type. For more information, see Step 2: Create and start a migration task. For more information about how to connect the server to the VPC, see Connect an on-premises data center to a VPC network.
- If you need to migrate data from a server that runs earlier operating systems, you must first upgrade GRand Unified Bootloader (GRUB) to 1.99 or later. The earlier operating systems include CentOS 5, RHEL 5.5, and Debian 7. If the operating system of the server is Amazon Linux, you must upgrade GRUB to 2.02 or later. For more information about how to install GRUB, see Install GRUB in a Linux server.

2.Use the Windows GUI version of an SMC client

Alibaba Cloud provides a Windows graphical user interface (GUI) version for a Server Migration Center (SMC) client. This allows you to migrate Windows servers to Alibaba Cloud. The settings for the SMC client on the GUI are the same as that on the command-line interface (CLI). The Windows GUI version is compatible with the CLI version.

Daemon mode

In the daemon mode, you can import the migration source information by using the SMC client. Then, you can log on to the SMC console to complete the migration. You only need to configure **Access Id** and **Secret Key**. For more information, see Migration process.

The following figure shows the Windows GUI in the daemon mode.

The following video shows how to use the Windows GUI. This allows you to migrate a source server to Alibaba Cloud in the SMC console:

Menu items on the GUI

The following figure shows the menu items of the Windows GUI client.

The following table describes the menu items.

No.	Section	Description

①	Top navigation bar	Consists of the **Config**, **Logs**, **View**, **Help**, and **Language** menus.
		• **Config**:
		  ○ Click **Rsync** to set the bandwidth limit for data transmission. Unit: KB/s.
		  ○ Click **Save User Config** to save the current settings for batch operations.
		  ○ Click **Clear Client Data** to initialize the client configuration file.
		• **Logs**:
		  ○ Click **Open Log File** to open the migration log file.
		  ○ Click **Open Logs Dir** to find the path of the migration log file.
		• **View**: Select **Hide Progress Log** to hide the **Progress Logs** column.
		• **Help**: Obtain online documentation or the version information of the SMC client.
		• **Language**: Select the display language of the GUI.

No.	Section	Description
②	Custom configuration section	Allows you to configure **Access Id** and **Secret Key**. The settings you configure are written to the *user_config.json* file of the SMC client.
③	Task progress and log section	Allows you to view the task progress or troubleshoot issues as prompted after you run the SMC client.

3.Migrate incremental data from a source server

Incremental migration allows you to migrate incremental data from the source server to Alibaba Cloud. You can specify the time interval between incremental migration tasks. Incremental migration reduces the service interruption time and the final time of delivering services. This topic describes the best practices for incremental migration.

Prerequisites

The source server information is imported to the SMC console. For more information, see Step 1: Import the information of a migration source.

> **Notice** Incremental migration is supported by SMC client 2.0.0 and later versions. Therefore, we recommend that you use SMC client 2.0.0 and later versions to import the migration source information.

Context

An incremental migration task creates an intermediate instance to facilitate the migration process. The intermediate instance incurs a small amount of fees. For more information, see Pay-as-you-go. The intermediate instance is released only when the incremental migration task is in the **Expired** state or when the task is deleted.

Procedure

The following steps show the best practices for incremental migration:

1. (Optional) Step 1: Exclude dynamic data directories
2. Step 2: Create and start an incremental migration task
3. Step 3: Stop businesses and run an incremental migration task

(Optional) Step 1: Exclude dynamic data directories

To ensure stability, we recommend that you exclude dynamic data directories, such as data directories of large databases, and migrate incremental data after the business is stopped. Skip this step if you do not need to exclude dynamic data directories from migration.

You can exclude dynamic data directories from migration without stopping businesses that run on the source server. Perform the following steps:

1. Log on to the source server.
2. Configure the SMC client to exclude dynamic data directories. For more information, see Exclude files or directories from migration.

Step 2: Create and start an incremental migration task

You can create and start an incremental migration task in the SMC console without stopping businesses that run on the source server. Perform the following steps:

1. Log on to the SMC console.
2. In the left-side navigation pane, click **Migration Sources**.

3. Find the source server from which you want to migrate data.
4. Click **Create Migration Task** in the **Actions** column.
5. In the **Create Migration Task** dialog box that appears, turn on the **Automatic Incremental Synchronization** switch, and set the **Synchronization Interval** and **Upperlimit of Reserved Images** parameters. Set other parameters based on your needs and then click **OK**.

   

   The parameters in the preceding figure are described as follows. For more information about other parameters, see Migration task parameters.

   - **Synchronization Interval**: Specify the time interval between incremental migration tasks.
   - **Upperlimit of Reserved Images**: Specify the maximum number of reserved images. Each incremental migration task generates new images. If the total number of generated image files exceeds the upper limit, the earliest and unused images are deleted.
   - **Method to Run**: Select a method to run the migration task. In this topic, *Run Now* is selected.

   The migration task runs immediately after it is created. The result is described as follows:

   i. The first incremental migration task migrates all data except the excluded directories and files from the source server. The task also generates a full image. You can use this image to create an instance for verification.

   ii. After the first incremental migration task is complete, SMC automatically migrates incremental data and generates new images at specific time points based on the **synchronization interval** that you have configured.

   > **Note** The image generated for each incremental migration task is a full image of the source server at a specific time. The image includes incremental data at the time of migration and all existing data that has already been migrated.

   In image names that are generated during incremental migration, `CYCLE_X` indicates that the image is generated by the Xth incremental migration task. As shown in the following figure, the sample image is generated by the second incremental migration task.

   

Step 3: Stop businesses and run an incremental migration task

After stopping businesses on the source server at a proper time, you can ignore the excluded data directories and run an incremental migration task again. Perform the following steps:

1. Log on to the source server. Stop businesses that run on the source server and ignore the excluded data directories.
2. In the SMC console, manually run the incremental migration task or wait for the task to automatically run. To manually run the incremental migration task, follow these steps:

   i. On the **Migration Tasks** page, find the migration task that you want to run.

   ii. In the **Actions** column, click the More icon and choose **Manual Incremental Migration** from the shortcut menu.

   

iii. In the **Start Migration Task** message that appears, click **OK**.

Result

On the **Migration Tasks** page, wait until the task is complete.

- If the migration task is in the **Waiting** state, the migration succeeds and you can obtain the image that was generated at the latest time point. This image contains all the data for the first full migration and each subsequent incremental migration of the source server.
- If the migration task is in the **InError** state, the migration fails. You must check the log to fix the issue before restarting the task. For more information about common errors and solutions, see SMC FAQ.

What's next

After you obtain the latest full image, you can perform the following operations:

- Create an instance to verify the image. Perform the following steps:
  i. On the **Migration Tasks** page, find the target migration task and click **Create Instance** in the **Actions** column.
  ii. On the **Custom Launch** tab, the **Image** section shows the latest full image. Configure other parameters based on your needs and purchase the instance. For more information, see Create an instance by using the provided wizard.
  iii. Connect to the instance and check the target system of server migration. For more information, see How can I check my system after migrating a Windows server? or How can I check my system after migrating a Linux server?
- Pause the incremental migration task. Perform the following steps:

  > **Note** You can pause an incremental migration task only when the task is in the **Syncing** or **Waiting** state.

  i. On the **Migration Tasks** page, find the target migration task.
  ii. In the **Actions** column, click the icon and choose **Pause** from the shortcut menu.
  iii. In the **Stop Migration Task** dialog box that appears, click **OK**.
- Delete the incremental migration task. Perform the following steps:
  i. On the **Migration Tasks** page, find the target migration task.
  ii. In the **Actions** column, click **Delete**.
  iii. In the **Delete Migration Tasks** dialog box that appears, click **OK**.

4.Migrate source servers to Container Registry

Server Migration Center (SMC) allows you to migrate servers to Container Registry. You can migrate containerized applications to Container Registry at low costs. Application containerization achieves automatic management and distribution of computing resources and ensures fast and secure deployment of applications. This improves resource usage and reduces computing costs. This topic describes how to migrate a server to Container Registry.

Prerequisites

- The server is not based on a Windows operating system.
- Container Registry is activated and a container image repository is created. For more information, see Activate an account and Create a repository.
- A RAM role is created for the intermediate instance that is generated by SMC for migration. Set the following parameters to configure the RAM role. For more information, see Create a RAM role for a trusted Alibaba Cloud service.
  - Select **Alibaba Cloud Service** as the trusted entity type.
  - Select **Normal Service Role** as the role type.
  - Select **Elastic Compute Service** as the trusted service.
- A custom policy is created for the RAM role of the intermediate instance. The policy grants the minimum permissions that are required to migrate a server to Container registry. The following example shows a sample policy. This policy is attached to the RAM role. For more information, see Create a custom policy and Grant permissions to a RAM role.

```
{
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "cr:GetAuthorizationToken",
        "cr:PushRepository",
        "cr:PullRepository",
        "cr:CreateRepository"
      ],
      "Resource": [
        "*"
      ]
    }
  ],
  "Version": "1"
}
```

- The information of the source server is imported to the SMC console. For more information, see

Step 1: Import the information of a migration source.

> **Notice** The SMC client V2.3.0 and later support server migration to Container Registry. You can use these SMC versions to import the information of the source server. Click here to download the latest version of the SMC client.

Context

- For information about Docker container images, see Concepts.
- During migration, SMC creates an intermediate instance. You are charged a small fee for the intermediate instance. For more information, see Pay-as-you-go.
- SMC releases the intermediate instance after the migration task enters the **Finished** or **Expired** state, or when the task is deleted.

Procedure

1. (Optional) Step 1: Exclude dynamic data directories
2. Step 2: Create and start a migration task
3. Step 3: Verify the container image

(Optional) Step 1: Exclude dynamic data directories

To ensure stable migration, we recommend that you exclude dynamic data directories, such as data directories of large databases. Then, you can pause the services on the source server and start the migration task. Skip this step if you do not need to exclude dynamic data directories.

You do not need to stop services on the source server to exclude dynamic data directories. To exclude dynamic data directories, perform the following steps.

1. Log on to the source server.
2. Configure the SMC client and exclude dynamic data directories.For more information, see Exclude files or directories from migration.

Step 2: Create and start a migration task

You can perform the following steps to exclude dynamic data directories. You do not need to stop your services that are running on the source server.

1. Log on to the SMC console.
2. In the left-side navigation pane, click **Migration Sources**.
3. Find the source server from which you want to migrate data.
4. Click **Create Migration Task** in the **Actions** column.
5. On the **Create Migration Task** page, set the container image parameters.Set the following parameters to configure the container image. For information about other parameters, see Step 2: Create and start a migration task.
   - **Target Image Type**: the type of the destination image. Select **Container Image**.
   - **Namespace**: the namespace of the destination image.
   - **Repository Name**: the name of the repository that stores the destination image.
   - **Version**: the version of the destination image.

- **RAM Role**: the RAM role that is attached to the intermediate instance.

The migration task starts immediately after it is created. Then, the migration task enters the Finished or InError state.

- If the migration task enters the Finished state, the task is completed and a container image is generated.
- If the migration task enters the **InError** state, the task fails. You can check the logs to troubleshoot the failure. Then, restart the migration task. For information about common errors and solutions, see SMC FAQ.

Step 3: Verify the container image

After you migrate the source server to Container Registry, a container image is created. Perform the following steps to verify the container image. A container image on which NGINX is deployed is used as an example.

1. Create a Kubernetes cluster in the Container Service for Kubernetes console. For more information, see Create a cluster of ACK Proprietary Edition.
2. Log on to the Container Service for Kubernetes console.
3. In the left-side navigation pane, click **Clusters** to view the created Kubernetes cluster.
4. In the **Actions** column, click **Applications**.
5. On the **Deployments** tab, click **Create from Image** to create a deployment.Set the following parameters. For information about other parameters and operations, see Create deployments by using images.
   - In the **Basic Information** step, set the following parameters:
     - **Name**: the name of the application. Set the value to nginx.
     - **Replicas**: the number of application replicas. Set the value to 1.
     - **Type**: the type of the application. Set the value to **Deployments**.

     
   - In the **Container** step, set the following parameters:
     - **Image Name**: Click **Select Image** to select the container image that is generated after the migration is complete. If the container image repository and the Kubernetes cluster are deployed in the same region, you can use the Virtual Private Cloud (VPC) endpoint of the container image to pull the image.
     - **Image Version**: Click **Select Image Version** to select the version of the container image that is generated after the migration is complete.
     - **Set Image Pull Secret**: This parameter is required if the container image is a private image. You can also use a plug-in to pull the image. This method does not require a secret. For more information, see Use aliyun-acr-credential-helper to pull images without a password.
     - **Port**: Add port 80.

     
     - **Start**: Enter the **/sbin/init** command.

     

- In the **Advanced** step, create a service to access the application.

  Use the example values in the following figure when you set the required parameters.

  

6. After the service is created, click **Details** to view the application status.
7. In the left-side navigation pane, click **Services**. On the Services page, view the **External Endpoint** of the service.
8. You can use a browser to access the external endpoint.

   

5.Estimate the time required for migration and test the transmission speed

The migration period is divided into three parts: pre-migration, migration, and post-migration. The migration period is proportional to the number of servers to be migrated and the actual data volume. We recommend that you estimate the migration time by conducting tests in advance. This topic describes how to estimate the time required for migration and how to test the transmission speed.

Context

During an SMC-based migration, the system first creates an intermediate instance under your account. Then, the system transfers data from the source server to the intermediate instance and creates an Alibaba Cloud ECS image of the intermediate instance. Therefore, the migration time is equal to the sum of the data transfer time and the image creation time. For more information, see Estimate the time required for migration.

During the migration process, the speed of transmission from the source server to the intermediate instance is the primary factor that determines the migration time. For more information about how to test the transmission speed, see Test the transmission speed.

In some cases, the data transmission speed is lower than the actual measured one. The following table lists the possible causes and solutions.

Possible cause	Solution
The source server and the intermediate instance are in different regions or countries. Network transmission across regions and countries is sometimes slower than that in the same region.	Check whether the network for the source server is the same as that for the intermediate instance in the target Alibaba Cloud region. If the problem is caused by cross-region transmission, you can perform the following operations: • Migrate the source server to Alibaba Cloud by generating an image in the same region, and then copy the image to the target region. For more information about how to copy an image, see Copy custom images. • Check whether the problem stems from the network service provider.
The source server has performance bottlenecks. For example, limited CPU, memory, and disk performance results in poor SMC transmission efficiency.	Improve the performance of the source server. For example, you can improve the CPU, memory, and disk performance.
By default, the SMC client uses the single-threaded data transfer model, which may have bottlenecks in some network environments.	Enable multi-threaded transfer acceleration to maximize bandwidth utilization. For more information, see Enable multi-threaded transfer acceleration.

> **Note** The examples in this topic are for reference only.

Estimate the time required for migration

The following figure shows how to estimate the time required for migration. Where:

- The speed for creating a snapshot is about 30 MB/s.
- For more information about how to test the network speed, see Test the transmission speed.

If you have a server with an actual disk usage of 10 GB and an outbound bandwidth of 10 Mbit/s, you can use the following method to estimate the migration time:

1. Convert units.
   - Actual data volume: 10 GB = 10 × 1024 = 10240 MB
   - Actual network speed: 10 Mbit/s = 10/8 = 1.25 MB/s
2. Calculate the data transfer time. Data transfer time: 10240/1.25 = 8192 seconds = 2.27 hours
3. Calculate the time required to create the image. Image creation time: 10240/30 = 341 seconds = 0.09 hours
4. Calculate the time required for migration. Migration time: 2.27 + 0.09 = 2.36 hours

Test the transmission speed

The speed of transmission from the source server to the intermediate instance is determined by the outbound bandwidth of the source server and the inbound bandwidth of the intermediate instance. By default, the inbound bandwidth of the intermediate instance is 200 Mbit/s. You can submit a ticket to increase the bandwidth.

For example:

- If the outbound bandwidth of the source server is 100 Mbit/s and the inbound bandwidth of the intermediate instance is 200 Mbit/s, the actual transmission speed is limited by the source server, and does not exceed 100 Mbit/s.
- If the outbound bandwidth of the source server is 300 Mbit/s and the inbound bandwidth of the intermediate instance is 200 Mbit/s, the actual transmission speed is limited by the intermediate instance, and does not exceed 200 Mbit/s.

> **Note** The instance bandwidth of 1 Mbit/s displayed in the ECS console is the outbound bandwidth of the intermediate instance. The 1 Mbit/s bandwidth does not affect the actual migration speed because the inbound bandwidth of the intermediate instance is used during migration.

To test the transmission speed by using iPerf, perform the following steps:

1. Create a pay-as-you-go ECS instance in the target Alibaba Cloud region.
2. In the ECS instance, perform the following steps:
   i. Install iPerf.
   ii. Start iPerf as a server.
   iii. Add a rule to the security group of the instance to allow traffic on the ports required by iPerf.

3. In the source server system, perform the following steps:
   i. Install iPerf.
   ii. Start iPerf as a client. Set the IP address of the destination server to the public IP address of the pay-as-you-go instance created in step 1.

Example of performing a transmission speed test on a Linux instance

The following example uses a CentOS 7 instance. The operations may vary with the version of your operating system.

1. Create a pay-as-you-go CentOS 7 instance in the target Alibaba Cloud region.
2. Add an inbound rule to the security group of the ECS instance to allow traffic on the ports required by iPerf. This example uses the default port for iPerf, which is TCP 5001.
3. Connect to the CentOS 7 instance.
4. In the CentOS 7 instance, perform the following steps:
   i. Run the following command to install iPerf:

   ```
   yum -y install iperf3
   ```

   ii. Run the following command to start iPerf as a server:

   ```
   iperf3 -s
   ```

5. In the source server system, perform the following steps:
   i. Download and install iPerf.
   ii. Run the following command to start iPerf as a client: Replace `<Instance IP address>` in the command with the public IP address of the created instance.

   ```
   iperf3 -c <Instance IP address> -i 1 -d
   ```

6. Wait for the iPerf test to complete and record the test results.

Example of performing a transmission speed test on a Windows instance

The following example uses a Windows Server 2008 instance. The operations may vary with the version of your operating system.

1. Create a pay-as-you-go Windows Server 2008 instance in the target Alibaba Cloud region.
2. Add an inbound rule to the security group of the ECS instance to allow traffic on the ports required by iPerf. This example uses the default port for iPerf, which is TCP 5001.
3. Connect to the instance.
4. In the Windows Server 2008 instance, perform the following steps:
   i. Download and install iPerf.
   ii. Open the Command Prompt.
   iii. Run the `cd <directory where iPerf is located>` command to go to the tool directory.
   iv. Run the `iperf3.exe -s` command to start iPerf as a server.
5. In the source server system, perform the following steps:
   i. Download and install iPerf.

ii. Run the following command to start iPerf as a client: Replace `<Instance IP address>` in the command with the public IP address of the created instance.

```
iperf3.exe -c <Instance IP address> -i 1 -d
```

6. Wait for the iPerf test to complete and record the test results.

Related information

- Create an instance by using the provided wizard
- Add security group rules
- Overview

6.Enable multi-threaded transfer acceleration

By default, the SMC client uses the single-threaded data transfer model, which may have bottlenecks in some network environments. You can enable multi-threaded transfer acceleration to maximize bandwidth utilization and improve transmission efficiency in high-bandwidth scenarios. SMC client V1.5.1.7 and later support multi-threaded transfer acceleration.

Context

Enabling multithreading increases CPU and bandwidth consumption on the source server. The more the threads, the more resources are consumed. Therefore, you must determine the number of threads based on the CPU cores and bandwidth conditions of the source server.

In a network environment with single-stream limit or low bandwidth, multi-threaded transfer may be not as efficient as single-threaded transfer. If conditions permit, upgrade the CPU of the source server to improve transmission efficiency.

Procedure

1. Download and decompress the SMC client package.
   i. On the migration source, download the SMC client.
   ii. Decompress the SMC client package. The SMC client is available for Windows and Linux in both the 32-bit version (i386) and the 64-bit version (x86_64). Select the version compatible with the migration source. The following figure shows the decompressed client folder.

iii. Decompress the selected client version. The following figure shows the files and directories stored in the decompressed folder.

Description of SMC client files

File or folder	Description
go2aliyun_client.exe	The Windows CLI executable file.
go2aliyun_gui.exe	The Windows GUI executable file. For more information about the GUI version, see Use the Windows GUI version of an SMC client.
go2aliyun_client	The Linux CLI executable file.
user_config.json	The configuration file of the migration source and destination.
Excludes	The folder in which to add directories to exclude from migration.
client_data	The migration data file, which includes the intermediate instance information and migration progress.

2. Go to the directory of the SMC client.
3. Open the *client_data* file and configure the parameters required for multithreading. You only need to set `extra.rsync.multi_threads.number` to a value greater than or equal to 2 to enable multithreading. The following figure shows that four threads have been configured for the SMC client.

Multithreading parameters

Parameter	Type	Description
extra.rsync.multi_threads.number	Integer	The number of threads. ○ If this parameter is set to 0 (default value), multithreading is disabled. ○ If this parameter is set to a value greater than or equal to 2, multithreading is enabled.
extra.rsync.multi_threads.mode	Integer	The multithreading mode. This is a reserved parameter that does not need to be modified. Default value: 0.

Parameter	Type	Description
extra.rsync.multi_threads.bandwidth_limit	Integer	The maximum bandwidth of each thread. Unit: KB/s. The default value is 0, which indicates unlimited bandwidth.

4. Close the *client_data* file and perform migration. For detailed steps on how to use SMC for a migration, see Migration process.

7.Import multiple migration tasks by using an Excel template

You can use the Excel template in Server Migration Center (SMC) to configure multiple migration tasks, and then import the migration tasks into the SMC console.

Prerequisites

Before you import multiple migration tasks, make sure that the migration sources meet the following conditions:

- The information of the migration sources is imported to the SMC console. For more information, see Import Migration Source Information.
- The migration sources are in the Active state. For information about how to restore a migration source to the Active state, see What can I do if I cannot create a migration task because a migration source is not in the Active state?

Procedure

1. Log on to the SMC console.
2. In the left-side navigation pane, click **Migration Tasks**.
3. On the **Migration Tasks** page, click **Import Migration**.
4. In the dialog box that appears, click **Download Template**. Download the Excel template to your local disk.

   
5. Configure migration tasks.
   i. Open the downloaded Excel template.
   ii. Configure migration tasks. The following table describes the parameters of each migration task.

Parameter	Type	Required	Description
SourceId	String	Yes	The ID of the migration source. For information about how to obtain the migration source ID, see Step 1: Import the information of a migration source.
RegionId	String	Yes	The ID of the Alibaba Cloud region to which the source server is migrated. For information about Alibaba Cloud regions, see .

Parameter	Type	Required	Description
Name	String	No	The name of the migration task. The name must meet the following requirements: ■ The name must be unique in an Alibaba Cloud region. ■ The name must be 2 to 128 characters in length, and can contain digits, colons (:), underscores (_), and hyphens (-). It must start with a letter, but cannot start with `http://` or `https://`.
Description	String	No	The description of the migration task. The name must be 2 to 128 characters in length, and can contain digits, colons (:), underscores (_), and hyphens (-). It must start with a letter, but cannot start with `http://` or `https://`.
ImageName	String	No	The name of the Alibaba Cloud image generated by SMC for the migration source. The name of the image must meet the following requirements: ■ The name must be 2 to 128 characters in length, and can contain digits, colons (:), underscores (_), and hyphens (-). It must start with a letter, but cannot start with `http://` or `https://`. ■ The name must be unique in an Alibaba Cloud region. If SMC detects that the image name already exists in the specified region while the migration task is running, SMC adds the migration task ID (JobId) to the image name as a suffix. Example: ImageName_j-2zexxxxxxxxxxxxx.
BandwidthLimit	Integer	No	The maximum bandwidth of data transmission during migration. Unit: KB/s. Valid values: 0 to 999999999. Default value: 0, which indicates that the bandwidth is not limited.

Parameter	Type	Required	Description
CompressLevel	Integer	No	The compression level of data in transmission during migration. Set the compression rate based on your requirements. Valid values: 0 to 10. ■ If the bandwidth is limited, a high compression rate improves the transmission efficiency. ■ If the bandwidth is high, we recommend that you do not compress data during transmission. This reduces the CPU workloads of the migration source. Default value: 0, which indicates that data is not compressed during transmission.
Checksum	Boolean	No	Specifies whether to verify data integrity by using a checksum. If you enable the checksum verification feature, data integrity is ensured while transmission speed may be reduced. Default value: false, which indicates that the checksum verification feature is disabled.
ScheduledStartTime	String	No	The time when the migration task is performed. The parameter value must meet the following requirements: ■ The time follows the ISO 8601 standard in the YYYY-MM-DDThh:mm:ssZ format. The time must be in UTC. Example: 2018-01-01T12:00:00Z. ■ The time is within 30 days after the current time.
SystemDiskSize	Integer	Yes	The system disk size of the destination Alibaba Cloud ECS instance. Unit: GiB. Valid values: 20 to 50. Note The size of the target system disk must be greater than the used space of the system disk on the source server. For example, if the size of the source system disk is 500 GiB and the used space is 100 GiB, the destination system disk must be larger than 100 GiB.

Parameter	Type	Required	Description
Disk<N>Size	Integer	No	The data disk size of the destination Alibaba Cloud ECS instance. Unit: GiB. Valid values: 20 to 32768. You can create destination data disks only for the data disks that already exist at the migration source. The `<N>` variable indicates the sequence number of the data disk. For example, if the migration source has two data disks, you must set the `Disk1Size` and the `Disk2Size` parameters. You can create up to 16 data disks. **Note** The size of the destination data disk must be greater than the used space of the data disk on the source server. For example, if the size of the source data disk is 500 GiB and the used space is 100 GiB, the destination system disk must be larger than 100 GiB.

iii. Save and close the Excel template.

6. Import the migration tasks.
   i. Return to the SMC console.
   ii. In the left-side navigation pane, click **Migration Tasks**.
   iii. On **Migration Tasks** page, click **Import Migration**.
   iv. In the dialog box that appears, click **Import Migration Tasks**.
   v. Select the Excel template, and then click **Open**.
   vi. In the dialog box of **Import Migration Tasks**, select the migration tasks that you want to import and click **OK**. The following figure shows an example of a migration task import list.

Note If the configurations of a migration task are invalid, the migration task cannot be selected. In this case, you can move the pointer over the icon, fix the error based on the error message, and then re-import the migration task.

Result

If the message `The migration task is imported.` appears in the upper-right corner of the **Migration Tasks** page, the selected migration tasks are imported.

What's next

Start the imported migration tasks.

- If you have specified the `ScheduledStartTime` parameter in the Excel template, the migration tasks automatically start at the specified time. You can check the migration progress on the **Migration Tasks** page.
- If the `ScheduledStartTime` parameter is not specified, you must manually start the migration tasks. For more information, see Start Migration Tasks.

> **Note** For information about how to handle a migration task interruption or failure, see What can I do if a migration task is interrupted or fails?

8.Migrate source servers to Alibaba Cloud

8.1. Migrate physical servers to Alibaba Cloud

This topic describes how to migrate your physical servers to Alibaba Cloud.

Context

Before the migration, complete the preparations based on the operating system of the VM. For more information, see the following topics:

- Prepare for the migration of a Windows-based physical servers to Alibaba Cloud
- Prepare for the migration of a Linux-based physical servers to Alibaba Cloud

After the preparations are complete, you can start the migration. For more information, see Migrate physical servers to Alibaba Cloud. If you migrate a VM for the first time, we recommend that you perform a test migration.

Prepare for the migration of a Windows-based physical servers to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Make sure that the VMWare VM has access to the following URLs and ports:
  - The endpoint `https://smc.aliyuncs.com:443` that is used to access SMC.
  - Ports 8080 and 8703 that are required to connect to the intermediate instance during the migration process.

    > **Note** During the migration, SMC creates, starts, stops, and releases the intermediate instance No_Delete_SMC_Transition_Instance. The default security group of the intermediate instance allows access to ports 8080 and 8703. Both ports are the migration service ports of the intermediate instance.

- Check virtualized applications. Elastic Compute Service (ECS) instances of Alibaba Cloud do not support built-in virtualized applications. After the migration, software such as VMware Workstation Pro, VirtualBox, and Hyper-V is not supported because such software can be used only on a physical server.
- Make sure that the Volume Shadow Copy Service (VSS) is enabled.
- Check whether the QEMU Guest Agent is installed. If the QEMU Guest Agent is installed, you must uninstall it. For information about how to uninstall the QEMU Guest Agent, see SMC FAQ.
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become

invalid.

Prepare for the migration of a Linux-based physical servers to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Make sure that the VMWare VM has access to the following URLs and ports:
  - The endpoint `https://smc.aliyuncs.com:443` that is used to access SMC.
  - Ports 8080 and 8703 that are required to connect to the intermediate instance during the migration process.

    > **Note** During the migration, SMC creates, starts, stops, and releases the intermediate instance No_Delete_SMC_Transition_Instance. The default security group of the intermediate instance allows access to ports 8080 and 8703. Both ports are the migration service ports of the intermediate instance.

- Check Security-Enhanced Linux (SELinux). You need to check whether SELinux is disabled on the Community Enterprise Operating System (CentOS) and Red Hat operating systems. You can use one of the following methods to disable SELinux:
  - Run the **setenforce 0** command to temporarily disable SELinux.
  - Open the configuration file in the */etc/selinux/config* directory, and then set SELINUX to `disabled` to permanently disable SELinux. For more information, see Enable or disable SELinux.
- Check the hypervisor. For more information, see Install a virtio driver.
- Check the version of GRand Unified Bootloader (GRUB). For earlier kernel versions such as CentOS 5, Red Hat 5, and Debian 7, you must upgrade GRUB to version 1.99 or later. For more information, see Install GRUB in a Linux server.
- Check virtualized applications. Elastic Compute Service (ECS) instances of Alibaba Cloud do not support built-in virtualized applications. After the migration, software such as VMware Workstation Pro, VirtualBox, and Hyper-V is not supported because such software can be used only on a physical server.
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.

Migrate physical servers to Alibaba Cloud

Create an Alibaba Cloud account. For more information, see Before you begin.

1. Download and decompress the SMC client package.
   i. Download the SMC client package.If the migration source has access to the Internet, you can also download the SMC client package to the migration source.

> **Note** You can log on to the SMC console. In the upper-right corner of the page, click **Download Latest SMC Client** to download the latest version of the SMC client.

ii. Upload the SMC client package to the migration source.

- You can build an FTP site to upload files. For more information, see Manually build an FTP site on a Windows instance or Manually build an FTP site on a CentOS 7 instance.
- You can also use a remote connection tool that supports file transfer. This allows you to upload the SMC client package to the migration source.

iii. Decompress the SMC client package.The SMC client is available for Windows and Linux of the 32-bit version (i386) and the 64-bit version (x86_64). Select the version that is compatible with the migration source. The following figure shows the decompressed client folders for Windows.

> **Note** Linux systems run the **unzip <name of the SMC client package>** command. This allows you to decompress the SMC client package. Make sure that the **unzip** utility is installed on the source server. For example, the installation command for CentOS 7 is **yum -y install unzip**.

iv. Decompress the client package that is compatible with the operating system of your source server.The following figure shows the directories and files in the decompressed folder.

SMC client folders and files

Folder or file	Description
go2aliyun_client.exe	The executable file of the command-line interface (CLI) program for Windows.
go2aliyun_gui.exe	The executable file of the graphical user interface (GUI) program for Windows. For more information, see Use the Windows GUI version of an SMC client.
go2aliyun_client	The executable file of the CLI program for Linux.
user_config.json	The configuration file of the migration source and destination.
Excludes	The folder of the files and directories that are excluded from migration.
client_data	The migration data file. This includes the intermediate instance information and migration progress.

2. Optional. Exclude files or directories from migration.

> **Note** If the source server supports block replication, you cannot exclude files or directories from migration.

The configuration files are located in the *Excludes* directory of the SMC client. If a configuration file is lost or deleted by accident, you can create another one.

- System disk configuration file: *rsync_excludes_win.txt* (for Windows servers) or *rsync_excludes_linux.txt* (for Linux servers)
- Data disk configuration file: named by adding a suffix *disk [disk index number]* to the system disk, for example, *rsync_excludes_win_disk1.txt* (for Windows servers) or *rsync_excludes_linux_disk1.txt* (for Linux servers)
- Example 1: Exclude files or directories from migration of a Windows server
  - System disk
    - Specify the files or directories to be excluded:

      ```
      C:\MyDirs\Docs\Words
      C:\MyDirs\Docs\Excels\Report1.txt
      ```

    - Add the following information to the *rsync_excludes_win.txt* file:

      ```
      /MyDirs/Docs/Words/
      /MyDirs/Docs/Excels/Report1.txt
      ```

  - Data disk
    - Specify the files or directories to be excluded:

      ```
      D:\MyDirs2\Docs2\Words2
      D:\MyDirs2\Docs2\Excels\Report2.txt
      ```

    - Add the following information to the *rsync_excludes_win_disk1.txt* file:

      ```
      /MyDirs2/Docs2/Words2/
      /MyDirs2/Docs2/Excels2/Report2.txt
      ```

    > **Note**
    >
    > To exclude a Windows directory, perform the following operations:
    >
    > - Remove the prefix of the directory (scr_path). In the preceding example, you must remove `D:`.
    > - Replace `\` with `/`.

- Example 2: Exclude files or directories from migration of a Linux server

- System disk (root directory/):
  - Specify the files or directories to be excluded:

    ```
    /var/mydirs/docs/words
    /var/mydirs/docs/excels/report1.txt
    ```

  - Add the following information to the *rsync_excludes_linux.txt* file:

    ```
    /var/mydirs/docs/words/
    /var/mydirs/docs/excels/report1.txt
    ```

- Data disk
  - Specify the files or directories to be excluded:

    ```
    /mnt/disk1/mydirs2/docs2/words2
    /mnt/disk1/mydirs2/docs2/excels2/report2.txt
    ```

  - Add the following information to the *rsync_excludes_linux_disk1.txt* file:

    ```
    /mydirs2/docs2/words2/
    /mydirs2/docs2/excels2/report2.txt
    ```

  > **Note** To exclude a Linux directory, you must remove the prefix of the directory (scr_path). In the preceding example, you must remove */mnt/disk1*.

3. Run the SMC client to import the migration source information.

i. Enter the SMC client folder and run the SMC client.

- For Windows servers, use one of the following methods to run the SMC client:
  - To run the Windows GUI version, double-click the *go2aliyun_gui.exe* file.
  - To run the Windows CLI version, double-click the *go2aliyun_client.exe* file.

> **Note** When you run the program, you must click **OK** to confirm that you have the administrator privilege.

- For Linux servers, run the SMC client as a root or sudo user.
  - In the directory of the *go2aliyun_client* file, run the following commands as a root user:

```
chmod +x go2aliyun_client
```

```
./go2aliyun_client
```

  - In the directory of the *go2aliyun_client* file, run the following commands as a sudo user:

```
sudo chmod +x ./go2aliyun_client
```

```
sudo ./go2aliyun_client
```

If you have required permissions on the migration source system, you can also run the following commands to import the migration source information. In this case, you do not need to enter your AccessKey pair.

- Run the following command as a root user:

```
./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
```

- Run the following command as a sudo user:

```
sudo ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
```

ii. Enter the AccessKey pair of your Alibaba Cloud account.

> Note If the AccessKey pair you entered is invalid, open the *user_config.json* file, delete the access_id and secret_key values, and then run the client again.

- For Windows servers
  - If you use the Windows GUI version, enter the **AccessKey ID** in the **Access Id** field, enter the *AccessKey secret* in the *Secret Key* field, and then click **Start**. For more information, see Use the Windows GUI version of the SMC client.
  - If you use the Windows CLI version, enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.
- For Linux servers

  Enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.

  

  The following prompts may appear:
  - The rsync tool is installed in most mainstream migration sources. If rsync is not installed on the migration source, the SMC client displays a prompt. Enter *yes* to install rsync, as shown in the following figure.

    
  - If SELinux is enabled on the migration source, you are prompted to disable SELinux. Enter *yes* to disable SELinux, as shown in the following figure.

    

> Notice Do not close the client until the migration is complete. Otherwise, the migration source will be disconnected from the SMC console and the migration fails.

4. Log on to the SMC console.
5. Create a migration task.
   i. In the left-side navigation pane, click **Migration Sources**.
   ii. Find the migration source that you want to migrate.You can obtain the ID of the target migration source from the SMC client, as shown in the following figure. Then, you can use the ID to find the target migration source in the SMC console. For more information, see the "How do I find a migration source in the SMC console?" section in SMC FAQ.

   

   iii. Click **Create Migration Task** in the Actions column.
   iv. In the **Create Migration Task** pane, read migration instructions and configure migration task parameters.

   The **Basic configuration** section includes the following parameters:
   - **Target Region**: required. The ID of the destination region. For more information about Alibaba Cloud regions, seeRegions and zones.

- **Task name**: the name of the migration task.

  > **Note** The task name must be unique in the destination region.

- **Description**: the description of the migration task.
- **Target Disk Size (GiB)**: the disk configuration of the destination server.

  The following table describes the parameters.

Parameter	Required	Description
Enable Block Replication	No	■ Selected: Block replication ensures a stable data transmission rate during migration. This also ensures that the source and destination disks use the same partitioning scheme. You cannot modify the size of each partition in the destination disk. When you enable block replication, the **Whether to enable block replication** switch appears next to **Partition <N>**. ■ Cleared: SMC uses the default method to migrate the migration source. You can modify the size of each partition in the destination disk.

Parameter	Required	Description
System Disk	Yes	■ **System Disk**: the system disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 500. The size of the destination system disk must be greater than that of data in the source system disk. For example, if the total size of the source system disk is 500 GiB but the size of data stored in this disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. **Note** The default value of this parameter is the size of the source system disk. We recommend that you retain the default value or specify a greater value. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination system disk based on that of the source system disk. Unit: GiB. Valid values: 0 to 98. `N` indicates the serial number of the partition. For example, if the system disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level.

Parameter	Required	Description
Data Disk <N>	No	■ **Data Disk <N>**: the data disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 32768. ■ If you select the **Data Disk <N>** check box, a destination data disk is generated. ■ `N` indicates the serial number of the data disk. ■ The size of the destination data disk must be greater than that of existing data in the source data disk. For example, if the total size of the source data disk is 500 GiB but the size of data stored in the disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination data disk based on that of the source data disk. Unit: GiB. Valid values: 0 to 141. `N` indicates the serial number of the partition. For example, if a data disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level. Note **Data Disk <N>** is available only if the migration source has a data disk. For more information, see Why are no data disk parameters displayed in the Create Migration Task pane? How can I resolve this issue?

■ **Target Image Type**: the type of the destination image. Valid values:

- **ECS Image.** The following table describes the parameters.

Parameter	Required	Description
Image Name	No	Specifies the name of the destination ECS image generated by SMC for the migration source. Note The image name must be unique in the destination region.
Automatic incremental synchronization	No	Specifies whether SMC automatically synchronizes incremental data of the migration source to Alibaba Cloud. ■ To enable this feature, you must configure the following parameters: ■ **Synchronization Interval**: the interval at which SMC automatically synchronizes incremental data to Alibaba Cloud ■ **Maximum mirror retention**: the maximum number of images that can be retained during incremental migration SMC automatically synchronizes incremental data to Alibaba Cloud at the specified interval. For more information about best practices for incremental migration, see Migrate incremental data from a source server. ■ If you disable this feature, incremental data is not synchronized.

- **Container Image.** The following table describes the parameters.

Note SMC does not allow you to migrate Windows servers to Container Registry. For more information, see Migrate source servers to Container Registry.

Parameter	Required	Description
Namespace	Yes	The namespace of the destination container image
Repository Name	Yes	The name of the repository that stores the destination container image
Version	No	The version of the destination container image
RAM Role	Yes	The instance RAM role that is attached to the intermediate instance

- **Method to Run**: specifies whether to run a task immediately after it is created and whether to automatically run the task.
  - **Run Now**: The migration task runs immediately after it is created.
  - **Run Later**: The migration task automatically runs at the specified time after it is created.

    > **Note** The earliest time that you can specify to run a migration task is 10 minutes after its creation.

  - **Create Only**: After the task is created, you must manually start the task.

  Default value: **Run Now**.

Tag and Network (Optional):

- **Migration Task Tag**: the tags that you specify for the migration task. Each tag contains a key and a value. You can use tags to query and manage migration tasks.

  > **Note** You can specify a maximum of 20 tags for a migration task.

- **Network Type**: the type of the network that is used to migrate data to an intermediate instance. During migration, SMC creates an intermediate instance that connects to a VSwitch in a virtual private cloud (VPC). When you select Public Network, a public IP address is assigned to the intermediate instance.

  The following table describes the valid values.

Parameter value	Description

Parameter value	Description
Public Network	SMC migrates data to the intermediate instance over the Internet. If you select Public Network, make sure that the migration source can access the Internet. You can choose whether to specify a VPC and a VSwitch based on your requirements. ■ If you specify a VPC and a VSwitch, SMC creates an intermediate instance that connects to the specified VPC and VSwitch. When you migrate multiple migration sources at a time, you can specify the same VPC and VSwitch for migration tasks. This improves the usage of VPC resources. You can migrate a maximum of 100 migration sources at a time. ■ If you do not specify a VPC or a VSwitch, SMC automatically creates a VPC and a VSwitch and creates an intermediate instance that connects to the VPC and the VSwitch. If you do not specify a VPC or a VSwitch before you migrate multiple migration sources at a time, SMC creates a VPC for each intermediate instance. Note Each Alibaba Cloud account can have a maximum of 10 VPCs in a region, including the VPCs that you create and the VPCs that are automatically created by SMC. Therefore, you can migrate a maximum of 10 migration sources at a time. To increase the VPC quota, submit a ticket.
VPC	SMC migrates data to the intermediate instance through a VPC. If you select VPC, you must specify a VPC and a VSwitch and make sure that the migration source can connect to the VPC. Note If your server in the on-premises data center, virtual machine, or cloud host can connect to a VPC, we recommend that you select this mode to migrate data. Compared with data migration over the Internet, VPC-based data migration is more efficient and stable. You can use VPN Gateway, Express Connect, and Smart Access Gateway to connect a migration source to a VPC. For more information, see Connect an on-premises data center to a VPC network.

Advanced Settings (Optional):

- **Transmission speed limit (KB/S)**: the maximum bandwidth for data transmission during migration. Unit: Kbit/s.

  The default value is 0, which indicates that the bandwidth is not limited.

- **Compression Level**: the compression ratio of data to be migrated. Set the compression ratio based on your requirements.
  - If the bandwidth is limited, a high compression ratio improves the transmission efficiency.
  - If a high bandwidth is available, we recommend that you do not compress data. Data compression consumes CPU resources of the migration source.

  The default value is 0, which indicates that data to be migrated is not compressed.
- **Checksum**: This feature enhances the verification of data consistency between the migration source and the destination server, but may compromise the data transmission rate.

  By default, this feature is disabled.

v. After the configuration is complete, click **OK**.

6. Start the migration task.

> **Note** If you set the Method to Run parameter to **Run Now**, skip this step. If you set the Method to Run parameter to **Create Only** or **Run Later**, you can perform the following steps to start the migration task.

i. In the left-side navigation pane, click **Migration Tasks**.

ii. Find the target migration task and click **Start** in the Actions column.
   - To start multiple migration tasks at a time, select the target tasks and click **Start/Retry** in the lower part of the Migration Tasks page. The status of the selected tasks must be **Ready**, **Stopped**, or **Error**.
   - To suspend a migration task in the **Syncing** state, click **Pause** in the **Actions** column.

What's next

After the migration is complete, perform the following operations based on the destination image type:

- ECS image: Create ECS instances by using a custom image. For more information, see Create an ECS instance by using a custom image.
- Container image: Deploy applications by using the container image. For more information, see Migrate source servers to Container Registry.

8.2. Migrate VMware VMs to Alibaba Cloud

This topic describes how to migrate VMware virtual machines (VMs) to Alibaba Cloud. After the migration, VMware Tools is no longer required by the Elastic Compute Service (ECS) instances in Alibaba Cloud.

Context

Before the migration, complete the preparations based on the operating system of the VM. For more information, see the following topics:

- Prepare for the migration of a Windows-based VMware VM to Alibaba Cloud
- Prepare for the migration of a Linux-based VMWare VM to Alibaba Cloud

After the preparations are complete, you can start the migration. For more information, see Migrate VMware VMs to Alibaba Cloud. If you migrate a VM for the first time, we recommend that you perform a test migration.

Prepare for the migration of a Windows-based VMware VM to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Make sure that the VMWare VM has access to the following URLs and ports:
  - The endpoint `https://smc.aliyuncs.com:443` that is used to access SMC.
  - Ports 8080 and 8703 that are required to connect to the intermediate instance during the migration process.

    > **Note** During the migration, SMC creates, starts, stops, and releases the intermediate instance No_Delete_SMC_Transition_Instance. The default security group of the intermediate instance allows access to ports 8080 and 8703. Both ports are the migration service ports of the intermediate instance.

- Make sure that the Volume Shadow Copy Service (VSS) is enabled.
- Check whether the QEMU Guest Agent is installed. If the QEMU Guest Agent is installed, you must uninstall it. For information about how to uninstall the QEMU Guest Agent, see SMC FAQ.
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.

Prepare for the migration of a Linux-based VMWare VM to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Make sure that the VMWare VM has access to the following URLs and ports:
  - The endpoint `https://smc.aliyuncs.com:443` that is used to access SMC.
  - Ports 8080 and 8703 that are required to connect to the intermediate instance during the migration process.

    > **Note** During the migration, SMC creates, starts, stops, and releases the intermediate instance No_Delete_SMC_Transition_Instance. The default security group of the intermediate instance allows access to ports 8080 and 8703. Both ports are the migration service ports of the intermediate instance.

- Check Security-Enhanced Linux (SELinux). You need to check whether SELinux is disabled on

the Community Enterprise Operating System (CentOS) and Red Hat operating systems. You can use one of the following methods to disable SELinux:

- Run the **setenforce 0** command to temporarily disable SELinux.
- Open the configuration file in the */etc/selinux/config* directory, and then set SELINUX to `disabled` to permanently disable SELinux. For more information, see Enable or disable SELinux.

- Check the hypervisor. For more information, see Install a virtio driver.
- Check the version of GRand Unified Bootloader (GRUB). For earlier kernel versions such as CentOS 5, Red Hat 5, and Debian 7, you must upgrade GRUB to version 1.99 or later. For more information, see Install GRUB in a Linux server.
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.

Migrate VMware VMs to Alibaba Cloud

Create an Alibaba Cloud account. For more information, see Before you begin.

1. Download and decompress the SMC client package.
   i. Download the SMC client package.If the migration source has access to the Internet, you can also download the SMC client package to the migration source.

   > **Note** You can log on to the SMC console. In the upper-right corner of the page, click **Download Latest SMC Client** to download the latest version of the SMC client.

   ii. Upload the SMC client package to the migration source.
      - You can build an FTP site to upload files. For more information, see Manually build an FTP site on a Windows instance or Manually build an FTP site on a CentOS 7 instance.
      - You can also use a remote connection tool that supports file transfer. This allows you to upload the SMC client package to the migration source.

   iii. Decompress the SMC client package.The SMC client is available for Windows and Linux of the 32-bit version (i386) and the 64-bit version (x86_64). Select the version that is compatible with the migration source. The following figure shows the decompressed client folders for Windows.

   > **Note** Linux systems run the **unzip <name of the SMC client package>** command. This allows you to decompress the SMC client package. Make sure that the **unzip** utility is installed on the source server. For example, the installation command for CentOS 7 is **yum -y install unzip**.

iv. Decompress the client package that is compatible with the operating system of your source server.The following figure shows the directories and files in the decompressed folder.

SMC client folders and files

Folder or file	Description
go2aliyun_client.exe	The executable file of the command-line interface (CLI) program for Windows.
go2aliyun_gui.exe	The executable file of the graphical user interface (GUI) program for Windows. For more information, see Use the Windows GUI version of an SMC client.
go2aliyun_client	The executable file of the CLI program for Linux.
user_config.json	The configuration file of the migration source and destination.
Excludes	The folder of the files and directories that are excluded from migration.
client_data	The migration data file. This includes the intermediate instance information and migration progress.

2. Optional. Exclude files or directories from migration.

> **Note** If the source server supports block replication, you cannot exclude files or directories from migration.

The configuration files are located in the *Excludes* directory of the SMC client. If a configuration file is lost or deleted by accident, you can create another one.

- System disk configuration file: *rsync_excludes_win.txt* (for Windows servers) or *rsync_excludes_linux.txt* (for Linux servers)
- Data disk configuration file: named by adding a suffix *disk [disk index number]* to the system disk, for example, *rsync_excludes_win_disk1.txt* (for Windows servers) or *rsync_excludes_linux_disk1.txt* (for Linux servers)
- Example 1: Exclude files or directories from migration of a Windows server
  - System disk
    - Specify the files or directories to be excluded:

```
C:\MyDirs\Docs\Words
C:\MyDirs\Docs\Excels\Report1.txt
```

- Add the following information to the *rsync_excludes_win.txt* file:

```
/MyDirs/Docs/Words/
/MyDirs/Docs/Excels/Report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

```
D:\MyDirs2\Docs2\Words2
D:\MyDirs2\Docs2\Excels\Report2.txt
```

  - Add the following information to the *rsync_excludes_win_disk1.txt* file:

```
/MyDirs2/Docs2/Words2/
/MyDirs2/Docs2/Excels2/Report2.txt
```

> **Note**
>
> To exclude a Windows directory, perform the following operations:
>
> - Remove the prefix of the directory (scr_path). In the preceding example, you must remove `D:`.
> - Replace `\` with `/`.

- Example 2: Exclude files or directories from migration of a Linux server
  - System disk (root directory/):
    - Specify the files or directories to be excluded:

```
/var/mydirs/docs/words
/var/mydirs/docs/excels/report1.txt
```

    - Add the following information to the *rsync_excludes_linux.txt* file:

```
/var/mydirs/docs/words/
/var/mydirs/docs/excels/report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

    ```
    /mnt/disk1/mydirs2/docs2/words2
    /mnt/disk1/mydirs2/docs2/excels2/report2.txt
    ```

  - Add the following information to the *rsync_excludes_linux_disk1.txt* file:

    ```
    /mydirs2/docs2/words2/
    /mydirs2/docs2/excels2/report2.txt
    ```

  > **Note** To exclude a Linux directory, you must remove the prefix of the directory (scr_path). In the preceding example, you must remove */mnt/disk1*.

3. Run the SMC client to import the migration source information.
   i. Enter the SMC client folder and run the SMC client.
   - For Windows servers, use one of the following methods to run the SMC client:
     - To run the Windows GUI version, double-click the *go2aliyun_gui.exe* file.
     - To run the Windows CLI version, double-click the *go2aliyun_client.exe* file.

     > **Note** When you run the program, you must click **OK** to confirm that you have the administrator privilege.

- For Linux servers, run the SMC client as a root or sudo user.
  - In the directory of the *go2aliyun_client* file, run the following commands as a root user:

    ```
    chmod +x go2aliyun_client
    ```

    ```
    ./go2aliyun_client
    ```

  - In the directory of the *go2aliyun_client* file, run the following commands as a sudo user:

    ```
    sudo chmod +x ./go2aliyun_client
    ```

    ```
    sudo ./go2aliyun_client
    ```

  If you have required permissions on the migration source system, you can also run the following commands to import the migration source information. In this case, you do not need to enter your AccessKey pair.

  - Run the following command as a root user:

    ```
    ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

  - Run the following command as a sudo user:

    ```
    sudo ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

ii. Enter the AccessKey pair of your Alibaba Cloud account.

> Note If the AccessKey pair you entered is invalid, open the *user_config.json* file, delete the access_id and secret_key values, and then run the client again.

- For Windows servers
  - If you use the Windows GUI version, enter the **AccessKey ID** in the **Access Id** field, enter the *AccessKey secret* in the *Secret Key* field, and then click **Start**. For more information, see Use the Windows GUI version of the SMC client.
  - If you use the Windows CLI version, enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.
- For Linux servers

  Enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.

  

  The following prompts may appear:

  - The rsync tool is installed in most mainstream migration sources. If rsync is not installed on the migration source, the SMC client displays a prompt. Enter *yes* to install rsync, as shown in the following figure.

    
  - If SELinux is enabled on the migration source, you are prompted to disable SELinux. Enter *yes* to disable SELinux, as shown in the following figure.

    

> Notice Do not close the client until the migration is complete. Otherwise, the migration source will be disconnected from the SMC console and the migration fails.

4. Log on to the SMC console.
5. Create a migration task.
   i. In the left-side navigation pane, click **Migration Sources**.
   ii. Find the migration source that you want to migrate.You can obtain the ID of the target migration source from the SMC client, as shown in the following figure. Then, you can use the ID to find the target migration source in the SMC console. For more information, see the "How do I find a migration source in the SMC console?" section in SMC FAQ.

   

   iii. Click **Create Migration Task** in the Actions column.
   iv. In the **Create Migration Task** pane, read migration instructions and configure migration task parameters.

   The **Basic configuration** section includes the following parameters:

   - **Target Region**: required. The ID of the destination region. For more information about Alibaba Cloud regions, seeRegions and zones.

- **Task name**: the name of the migration task.

  > **Note** The task name must be unique in the destination region.

- **Description**: the description of the migration task.
- **Target Disk Size (GiB)**: the disk configuration of the destination server.

  The following table describes the parameters.

Parameter	Required	Description
Enable Block Replication	No	■ Selected: Block replication ensures a stable data transmission rate during migration. This also ensures that the source and destination disks use the same partitioning scheme. You cannot modify the size of each partition in the destination disk. When you enable block replication, the **Whether to enable block replication** switch appears next to **Partition <N>**. ■ Cleared: SMC uses the default method to migrate the migration source. You can modify the size of each partition in the destination disk.

Parameter	Required	Description
System Disk	Yes	■ **System Disk**: the system disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 500. The size of the destination system disk must be greater than that of data in the source system disk. For example, if the total size of the source system disk is 500 GiB but the size of data stored in this disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. **Note** The default value of this parameter is the size of the source system disk. We recommend that you retain the default value or specify a greater value. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination system disk based on that of the source system disk. Unit: GiB. Valid values: 0 to 98. `N` indicates the serial number of the partition. For example, if the system disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level.

Parameter	Required	Description
Data Disk <N>	No	■ **Data Disk <N>**: the data disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 32768. ■ If you select the **Data Disk <N>** check box, a destination data disk is generated. ■ `N` indicates the serial number of the data disk. ■ The size of the destination data disk must be greater than that of existing data in the source data disk. For example, if the total size of the source data disk is 500 GiB but the size of data stored in the disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination data disk based on that of the source data disk. Unit: GiB. Valid values: 0 to 141. `N` indicates the serial number of the partition. For example, if a data disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level. Note Data Disk <N> is available only if the migration source has a data disk. For more information, see Why are no data disk parameters displayed in the Create Migration Task pane? How can I resolve this issue?

■ **Target Image Type**: the type of the destination image. Valid values:

- **ECS Image.** The following table describes the parameters.

Parameter	Required	Description
Image Name	No	Specifies the name of the destination ECS image generated by SMC for the migration source. Note The image name must be unique in the destination region.
Automatic incremental synchronization	No	Specifies whether SMC automatically synchronizes incremental data of the migration source to Alibaba Cloud. ■ To enable this feature, you must configure the following parameters: ■ **Synchronization Interval**: the interval at which SMC automatically synchronizes incremental data to Alibaba Cloud ■ **Maximum mirror retention**: the maximum number of images that can be retained during incremental migration SMC automatically synchronizes incremental data to Alibaba Cloud at the specified interval. For more information about best practices for incremental migration, see Migrate incremental data from a source server. ■ If you disable this feature, incremental data is not synchronized.

- **Container Image.** The following table describes the parameters.

Note SMC does not allow you to migrate Windows servers to Container Registry. For more information, see Migrate source servers to Container Registry.

Parameter	Required	Description
Namespace	Yes	The namespace of the destination container image
Repository Name	Yes	The name of the repository that stores the destination container image
Version	No	The version of the destination container image
RAM Role	Yes	The instance RAM role that is attached to the intermediate instance

- **Method to Run**: specifies whether to run a task immediately after it is created and whether to automatically run the task.
  - **Run Now**: The migration task runs immediately after it is created.
  - **Run Later**: The migration task automatically runs at the specified time after it is created.

    > **Note** The earliest time that you can specify to run a migration task is 10 minutes after its creation.

  - **Create Only**: After the task is created, you must manually start the task.

  Default value: **Run Now**.

Tag and Network (Optional):

- **Migration Task Tag**: the tags that you specify for the migration task. Each tag contains a key and a value. You can use tags to query and manage migration tasks.

  > **Note** You can specify a maximum of 20 tags for a migration task.

- **Network Type**: the type of the network that is used to migrate data to an intermediate instance. During migration, SMC creates an intermediate instance that connects to a VSwitch in a virtual private cloud (VPC). When you select Public Network, a public IP address is assigned to the intermediate instance.

  The following table describes the valid values.

Parameter value	Description

Parameter value	Description
Public Network	SMC migrates data to the intermediate instance over the Internet. If you select Public Network, make sure that the migration source can access the Internet. You can choose whether to specify a VPC and a VSwitch based on your requirements. ■ If you specify a VPC and a VSwitch, SMC creates an intermediate instance that connects to the specified VPC and VSwitch. When you migrate multiple migration sources at a time, you can specify the same VPC and VSwitch for migration tasks. This improves the usage of VPC resources. You can migrate a maximum of 100 migration sources at a time. ■ If you do not specify a VPC or a VSwitch, SMC automatically creates a VPC and a VSwitch and creates an intermediate instance that connects to the VPC and the VSwitch. If you do not specify a VPC or a VSwitch before you migrate multiple migration sources at a time, SMC creates a VPC for each intermediate instance. Note Each Alibaba Cloud account can have a maximum of 10 VPCs in a region, including the VPCs that you create and the VPCs that are automatically created by SMC. Therefore, you can migrate a maximum of 10 migration sources at a time. To increase the VPC quota, submit a ticket.
VPC	SMC migrates data to the intermediate instance through a VPC. If you select VPC, you must specify a VPC and a VSwitch and make sure that the migration source can connect to the VPC. Note If your server in the on-premises data center, virtual machine, or cloud host can connect to a VPC, we recommend that you select this mode to migrate data. Compared with data migration over the Internet, VPC-based data migration is more efficient and stable. You can use VPN Gateway, Express Connect, and Smart Access Gateway to connect a migration source to a VPC. For more information, see Connect an on-premises data center to a VPC network.

Advanced Settings (Optional):

- **Transmission speed limit (KB/S)**: the maximum bandwidth for data transmission during migration. Unit: Kbit/s.

  The default value is 0, which indicates that the bandwidth is not limited.

- **Compression Level**: the compression ratio of data to be migrated. Set the compression ratio based on your requirements.
  - If the bandwidth is limited, a high compression ratio improves the transmission efficiency.
  - If a high bandwidth is available, we recommend that you do not compress data. Data compression consumes CPU resources of the migration source.

  The default value is 0, which indicates that data to be migrated is not compressed.
- **Checksum**: This feature enhances the verification of data consistency between the migration source and the destination server, but may compromise the data transmission rate.

  By default, this feature is disabled.

v. After the configuration is complete, click **OK**.

6. Start the migration task.

> **Note** If you set the Method to Run parameter to **Run Now**, skip this step. If you set the Method to Run parameter to **Create Only** or **Run Later**, you can perform the following steps to start the migration task.

i. In the left-side navigation pane, click **Migration Tasks**.

ii. Find the target migration task and click **Start** in the Actions column.
   - To start multiple migration tasks at a time, select the target tasks and click **Start/Retry** in the lower part of the Migration Tasks page. The status of the selected tasks must be **Ready**, **Stopped**, or **Error**.
   - To suspend a migration task in the **Syncing** state, click **Pause** in the **Actions** column.

What's next

After the migration is complete, perform the following operations based on the destination image type:

- ECS image: Create ECS instances by using a custom image. For more information, see Create an ECS instance by using a custom image.
- Container image: Deploy applications by using the container image. For more information, see Migrate source servers to Container Registry.

8.3. Migrate Xen, KVM, or Hyper-V VMs to Alibaba Cloud

This topic describes how to migrate Xen, KVM, or Hyper-V virtual machines (VMs) to Alibaba Cloud.

Context

Before the migration, complete the preparations based on the operating system of the VM. For more information, see the following topics:

- Prepare for the migration of a Windows-based Xen, KVM, or Hyper-V VM to Alibaba Cloud

- Prepare for the migration of a Linux-based Xen, KVM, or Hyper-V VM to Alibaba Cloud

After the preparations are complete, you can start the migration. For more information, see Migrate Xen, KVM, or Hyper-V VMs to Alibaba Cloud. If you migrate a VM for the first time, we recommend that you perform a test migration.

Prepare for the migration of a Windows-based Xen, KVM, or Hyper-V VM to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Make sure that the VMWare VM has access to the following URLs and ports:
  - The endpoint `https://smc.aliyuncs.com:443` that is used to access SMC.
  - Ports 8080 and 8703 that are required to connect to the intermediate instance during the migration process.

    > **Note** During the migration, SMC creates, starts, stops, and releases the intermediate instance No_Delete_SMC_Transition_Instance. The default security group of the intermediate instance allows access to ports 8080 and 8703. Both ports are the migration service ports of the intermediate instance.

- Make sure that the Volume Shadow Copy Service (VSS) is enabled.
- Check whether the QEMU Guest Agent is installed. If the QEMU Guest Agent is installed, you must uninstall it. For information about how to uninstall the QEMU Guest Agent, see SMC FAQ.
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.

Prepare for the migration of a Linux-based Xen, KVM, or Hyper-V VM to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Make sure that the VMWare VM has access to the following URLs and ports:
  - The endpoint `https://smc.aliyuncs.com:443` that is used to access SMC.
  - Ports 8080 and 8703 that are required to connect to the intermediate instance during the migration process.

    > **Note** During the migration, SMC creates, starts, stops, and releases the intermediate instance No_Delete_SMC_Transition_Instance. The default security group of the intermediate instance allows access to ports 8080 and 8703. Both ports are the migration service ports of the intermediate instance.

- Check Security-Enhanced Linux (SELinux). You need to check whether SELinux is disabled on the Community Enterprise Operating System (CentOS) and Red Hat operating systems. You can use one of the following methods to disable SELinux:
  - Run the **setenforce 0** command to temporarily disable SELinux.
  - Open the configuration file in the */etc/selinux/config* directory, and then set SELINUX to `disabled` to permanently disable SELinux. For more information, see Enable or disable SELinux.
- Check the hypervisor. For more information, see Install a virtio driver.
- Check the version of GRand Unified Bootloader (GRUB). For earlier kernel versions such as CentOS 5, Red Hat 5, and Debian 7, you must upgrade GRUB to version 1.99 or later. For more information, see Install GRUB in a Linux server.
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.

Migrate Xen, KVM, or Hyper-V VMs to Alibaba Cloud

Create an Alibaba Cloud account. For more information, see Before you begin.

1. Download and decompress the SMC client package.
   i. Download the SMC client package.If the migration source has access to the Internet, you can also download the SMC client package to the migration source.

   > **Note** You can log on to the SMC console. In the upper-right corner of the page, click **Download Latest SMC Client** to download the latest version of the SMC client.

   ii. Upload the SMC client package to the migration source.
      - You can build an FTP site to upload files. For more information, see Manually build an FTP site on a Windows instance or Manually build an FTP site on a CentOS 7 instance.
      - You can also use a remote connection tool that supports file transfer. This allows you to upload the SMC client package to the migration source.

   iii. Decompress the SMC client package.The SMC client is available for Windows and Linux of the 32-bit version (i386) and the 64-bit version (x86_64). Select the version that is compatible with the migration source. The following figure shows the decompressed client folders for Windows.

   > **Note** Linux systems run the **unzip <name of the SMC client package>** command. This allows you to decompress the SMC client package. Make sure that the **unzip** utility is installed on the source server. For example, the installation command for CentOS 7 is **yum -y install unzip**.

iv. Decompress the client package that is compatible with the operating system of your source server.The following figure shows the directories and files in the decompressed folder.

SMC client folders and files

Folder or file	Description
go2aliyun_client.exe	The executable file of the command-line interface (CLI) program for Windows.
go2aliyun_gui.exe	The executable file of the graphical user interface (GUI) program for Windows. For more information, see Use the Windows GUI version of an SMC client.
go2aliyun_client	The executable file of the CLI program for Linux.
user_config.json	The configuration file of the migration source and destination.
Excludes	The folder of the files and directories that are excluded from migration.
client_data	The migration data file. This includes the intermediate instance information and migration progress.

2. Optional. Exclude files or directories from migration.

> **Note** If the source server supports block replication, you cannot exclude files or directories from migration.

The configuration files are located in the *Excludes* directory of the SMC client. If a configuration file is lost or deleted by accident, you can create another one.

- System disk configuration file: *rsync_excludes_win.txt* (for Windows servers) or *rsync_excludes_linux.txt* (for Linux servers)
- Data disk configuration file: named by adding a suffix *disk [disk index number]* to the system disk, for example, *rsync_excludes_win_disk1.txt* (for Windows servers) or *rsync_excludes_linux_disk1.txt* (for Linux servers)
- Example 1: Exclude files or directories from migration of a Windows server
  - System disk
    - Specify the files or directories to be excluded:

```
C:\MyDirs\Docs\Words
C:\MyDirs\Docs\Excels\Report1.txt
```

- Add the following information to the *rsync_excludes_win.txt* file:

```
/MyDirs/Docs/Words/
/MyDirs/Docs/Excels/Report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

```
D:\MyDirs2\Docs2\Words2
D:\MyDirs2\Docs2\Excels\Report2.txt
```

  - Add the following information to the *rsync_excludes_win_disk1.txt* file:

```
/MyDirs2/Docs2/Words2/
/MyDirs2/Docs2/Excels2/Report2.txt
```

> **Note**
>
> To exclude a Windows directory, perform the following operations:
>
> - Remove the prefix of the directory (scr_path). In the preceding example, you must remove `D:`.
> - Replace `\` with `/`.

- Example 2: Exclude files or directories from migration of a Linux server
  - System disk (root directory/):
    - Specify the files or directories to be excluded:

```
/var/mydirs/docs/words
/var/mydirs/docs/excels/report1.txt
```

    - Add the following information to the *rsync_excludes_linux.txt* file:

```
/var/mydirs/docs/words/
/var/mydirs/docs/excels/report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

    ```
    /mnt/disk1/mydirs2/docs2/words2
    /mnt/disk1/mydirs2/docs2/excels2/report2.txt
    ```

  - Add the following information to the *rsync_excludes_linux_disk1.txt* file:

    ```
    /mydirs2/docs2/words2/
    /mydirs2/docs2/excels2/report2.txt
    ```

> **Note** To exclude a Linux directory, you must remove the prefix of the directory (scr_path). In the preceding example, you must remove */mnt/disk1*.

3. Run the SMC client to import the migration source information.
   i. Enter the SMC client folder and run the SMC client.
   - For Windows servers, use one of the following methods to run the SMC client:
     - To run the Windows GUI version, double-click the *go2aliyun_gui.exe* file.
     - To run the Windows CLI version, double-click the *go2aliyun_client.exe* file.

> **Note** When you run the program, you must click **OK** to confirm that you have the administrator privilege.

- For Linux servers, run the SMC client as a root or sudo user.
  - In the directory of the *go2aliyun_client* file, run the following commands as a root user:

    ```
    chmod +x go2aliyun_client
    ```

    ```
    ./go2aliyun_client
    ```

  - In the directory of the *go2aliyun_client* file, run the following commands as a sudo user:

    ```
    sudo chmod +x ./go2aliyun_client
    ```

    ```
    sudo ./go2aliyun_client
    ```

  If you have required permissions on the migration source system, you can also run the following commands to import the migration source information. In this case, you do not need to enter your AccessKey pair.

  - Run the following command as a root user:

    ```
    ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

  - Run the following command as a sudo user:

    ```
    sudo ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

ii. Enter the AccessKey pair of your Alibaba Cloud account.

> Note If the AccessKey pair you entered is invalid, open the *user_config.json* file, delete the access_id and secret_key values, and then run the client again.

- For Windows servers
  - If you use the Windows GUI version, enter the **AccessKey ID** in the **Access Id** field, enter the *AccessKey secret* in the *Secret Key* field, and then click **Start**. For more information, see Use the Windows GUI version of the SMC client.
  - If you use the Windows CLI version, enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.
- For Linux servers

  Enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.

  

  The following prompts may appear:
  - The rsync tool is installed in most mainstream migration sources. If rsync is not installed on the migration source, the SMC client displays a prompt. Enter *yes* to install rsync, as shown in the following figure.

    
  - If SELinux is enabled on the migration source, you are prompted to disable SELinux. Enter *yes* to disable SELinux, as shown in the following figure.

    

> Notice Do not close the client until the migration is complete. Otherwise, the migration source will be disconnected from the SMC console and the migration fails.

4. Log on to the SMC console.
5. Create a migration task.
   i. In the left-side navigation pane, click **Migration Sources**.
   ii. Find the migration source that you want to migrate.You can obtain the ID of the target migration source from the SMC client, as shown in the following figure. Then, you can use the ID to find the target migration source in the SMC console. For more information, see the "How do I find a migration source in the SMC console?" section in SMC FAQ.

   

   iii. Click **Create Migration Task** in the Actions column.
   iv. In the **Create Migration Task** pane, read migration instructions and configure migration task parameters.

   The **Basic configuration** section includes the following parameters:
   - **Target Region**: required. The ID of the destination region. For more information about Alibaba Cloud regions, seeRegions and zones.

- **Task name**: the name of the migration task.

  > **Note** The task name must be unique in the destination region.

- **Description**: the description of the migration task.
- **Target Disk Size (GiB)**: the disk configuration of the destination server.

  The following table describes the parameters.

Parameter	Required	Description
Enable Block Replication	No	■ Selected: Block replication ensures a stable data transmission rate during migration. This also ensures that the source and destination disks use the same partitioning scheme. You cannot modify the size of each partition in the destination disk. When you enable block replication, the **Whether to enable block replication** switch appears next to **Partition <N>**. ■ Cleared: SMC uses the default method to migrate the migration source. You can modify the size of each partition in the destination disk.

Parameter	Required	Description
System Disk	Yes	■ **System Disk**: the system disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 500. The size of the destination system disk must be greater than that of data in the source system disk. For example, if the total size of the source system disk is 500 GiB but the size of data stored in this disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. **Note** The default value of this parameter is the size of the source system disk. We recommend that you retain the default value or specify a greater value. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination system disk based on that of the source system disk. Unit: GiB. Valid values: 0 to 98. `N` indicates the serial number of the partition. For example, if the system disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level.

Parameter	Required	Description
Data Disk <N>	No	■ **Data Disk <N>**: the data disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 32768. ■ If you select the **Data Disk <N>** check box, a destination data disk is generated. ■ `N` indicates the serial number of the data disk. ■ The size of the destination data disk must be greater than that of existing data in the source data disk. For example, if the total size of the source data disk is 500 GiB but the size of data stored in the disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination data disk based on that of the source data disk. Unit: GiB. Valid values: 0 to 141. `N` indicates the serial number of the partition. For example, if a data disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level. Note **Data Disk <N>** is available only if the migration source has a data disk. For more information, see Why are no data disk parameters displayed in the Create Migration Task pane? How can I resolve this issue?

■ **Target Image Type**: the type of the destination image. Valid values:

- **ECS Image.** The following table describes the parameters.

Parameter	Required	Description
Image Name	No	Specifies the name of the destination ECS image generated by SMC for the migration source. Note The image name must be unique in the destination region.
Automatic incremental synchronization	No	Specifies whether SMC automatically synchronizes incremental data of the migration source to Alibaba Cloud. ■ To enable this feature, you must configure the following parameters: ■ **Synchronization Interval**: the interval at which SMC automatically synchronizes incremental data to Alibaba Cloud ■ **Maximum mirror retention**: the maximum number of images that can be retained during incremental migration SMC automatically synchronizes incremental data to Alibaba Cloud at the specified interval. For more information about best practices for incremental migration, see Migrate incremental data from a source server. ■ If you disable this feature, incremental data is not synchronized.

- **Container Image.** The following table describes the parameters.

Note SMC does not allow you to migrate Windows servers to Container Registry. For more information, see Migrate source servers to Container Registry.

Parameter	Required	Description
Namespace	Yes	The namespace of the destination container image
Repository Name	Yes	The name of the repository that stores the destination container image
Version	No	The version of the destination container image
RAM Role	Yes	The instance RAM role that is attached to the intermediate instance

- **Method to Run**: specifies whether to run a task immediately after it is created and whether to automatically run the task.
  - **Run Now**: The migration task runs immediately after it is created.
  - **Run Later**: The migration task automatically runs at the specified time after it is created.

    > **Note** The earliest time that you can specify to run a migration task is 10 minutes after its creation.

  - **Create Only**: After the task is created, you must manually start the task.

  Default value: **Run Now**.

Tag and Network (Optional):

- **Migration Task Tag**: the tags that you specify for the migration task. Each tag contains a key and a value. You can use tags to query and manage migration tasks.

  > **Note** You can specify a maximum of 20 tags for a migration task.

- **Network Type**: the type of the network that is used to migrate data to an intermediate instance. During migration, SMC creates an intermediate instance that connects to a VSwitch in a virtual private cloud (VPC). When you select Public Network, a public IP address is assigned to the intermediate instance.

  The following table describes the valid values.

Parameter value	Description

Parameter value	Description
Public Network	SMC migrates data to the intermediate instance over the Internet. If you select Public Network, make sure that the migration source can access the Internet. You can choose whether to specify a VPC and a VSwitch based on your requirements. ■ If you specify a VPC and a VSwitch, SMC creates an intermediate instance that connects to the specified VPC and VSwitch. When you migrate multiple migration sources at a time, you can specify the same VPC and VSwitch for migration tasks. This improves the usage of VPC resources. You can migrate a maximum of 100 migration sources at a time. ■ If you do not specify a VPC or a VSwitch, SMC automatically creates a VPC and a VSwitch and creates an intermediate instance that connects to the VPC and the VSwitch. If you do not specify a VPC or a VSwitch before you migrate multiple migration sources at a time, SMC creates a VPC for each intermediate instance. Note Each Alibaba Cloud account can have a maximum of 10 VPCs in a region, including the VPCs that you create and the VPCs that are automatically created by SMC. Therefore, you can migrate a maximum of 10 migration sources at a time. To increase the VPC quota, submit a ticket.
VPC	SMC migrates data to the intermediate instance through a VPC. If you select VPC, you must specify a VPC and a VSwitch and make sure that the migration source can connect to the VPC. Note If your server in the on-premises data center, virtual machine, or cloud host can connect to a VPC, we recommend that you select this mode to migrate data. Compared with data migration over the Internet, VPC-based data migration is more efficient and stable. You can use VPN Gateway, Express Connect, and Smart Access Gateway to connect a migration source to a VPC. For more information, see Connect an on-premises data center to a VPC network.

Advanced Settings (Optional):

- **Transmission speed limit (KB/S)**: the maximum bandwidth for data transmission during migration. Unit: Kbit/s.

  The default value is 0, which indicates that the bandwidth is not limited.

- **Compression Level**: the compression ratio of data to be migrated. Set the compression ratio based on your requirements.
  - If the bandwidth is limited, a high compression ratio improves the transmission efficiency.
  - If a high bandwidth is available, we recommend that you do not compress data. Data compression consumes CPU resources of the migration source.

  The default value is 0, which indicates that data to be migrated is not compressed.
- **Checksum**: This feature enhances the verification of data consistency between the migration source and the destination server, but may compromise the data transmission rate.

  By default, this feature is disabled.

v. After the configuration is complete, click **OK**.

6. Start the migration task.

> **Note** If you set the Method to Run parameter to **Run Now**, skip this step. If you set the Method to Run parameter to **Create Only** or **Run Later**, you can perform the following steps to start the migration task.

i. In the left-side navigation pane, click **Migration Tasks**.

ii. Find the target migration task and click **Start** in the Actions column.
- To start multiple migration tasks at a time, select the target tasks and click **Start/Retry** in the lower part of the Migration Tasks page. The status of the selected tasks must be **Ready**, **Stopped**, or **Error**.
- To suspend a migration task in the **Syncing** state, click **Pause** in the **Actions** column.

What's next

After the migration is complete, perform the following operations based on the destination image type:

- ECS image: Create ECS instances by using a custom image. For more information, see Create an ECS instance by using a custom image.
- Container image: Deploy applications by using the container image. For more information, see Migrate source servers to Container Registry.

8.4. Migrate AWS VMs to Alibaba Cloud

This topic describes how to migrate Amazon Web Services (AWS) virtual machines (VMs) to Alibaba Cloud.

Context

Before the migration, complete the preparations based on the operating system of the VM. For more information, see the following topics:

- Prepare for the migration of a Windows-based AWS VM to Alibaba Cloud
- Prepare for the migration of a Linux-based AWS VM to Alibaba Cloud

After the preparations are complete, you can start the migration. If you migrate a VM for the first time, we recommend that you perform a test migration.

Prepare for the migration of a Windows-based AWS VM to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.
- Check the network environment.
  - For information about how to perform migration across regions outside mainland China, see Migrate AWS VMs to Alibaba Cloud across regions outside mainland China.
  - If a VPC network is available, we recommend that you perform migration over the VPC network. Compared with migration over the Internet, migration over the VPC is more efficient and stable.
- Make sure that the Volume Shadow Copy Service (VSS) is enabled.
- Check whether the QEMU Guest Agent is installed. If the QEMU Guest Agent is installed, you must uninstall it. For information about how to uninstall the QEMU Guest Agent, see SMC FAQ.

Prepare for the migration of a Linux-based AWS VM to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.
- Check the network environment.
  - For information about how to perform migration across regions outside mainland China, see Migrate AWS VMs to Alibaba Cloud across regions outside mainland China.
  - If a VPC network is available, we recommend that you perform migration over the VPC network. Compared with migration over the Internet, migration over the VPC is more efficient and stable.
- Check cloud-init configurations.

  Cloud-init is developed to initialize cloud instances across platforms. However, the cloud-init service configurations of AWS and Alibaba Cloud are not cross-compatible. Instances that are migrated from AWS VMs to Alibaba Cloud may fail to start and the network may fail to connect. We recommend that you use the cloud-init configurations of Alibaba Cloud on the AWS VM. For more information, see Install cloud-init. You can also uninstall cloud-init from your AWS VM.
- Check the version of GRand Unified Bootloader (GRUB).

For Amazon Linux operating systems, you must upgrade GRUB to version 2.02 or later. For earlier kernel versions such as CentOS 5, Red Hat 5, and Debian 7, you must upgrade GRUB to version 1.99 or later. For more information, see Install GRUB in a Linux server.

> Note Use root permission to upgrade GRUB.

Migrate AWS VMs to Alibaba Cloud across regions outside mainland China

Perform the following operations to migrate AWS VMs to Alibaba Cloud and create Elastic Compute Service (ECS) instances based on a custom image.

1. Migrate AWS VMs to Alibaba Cloud across regions outside mainland China. Select ECS Image as the destination image type. For more information, see the section Migrate AWS VMs to Alibaba Cloud.If an AWS VM resides in the United States, you can migrate the VM to an Alibaba Cloud region in the United States. For information about regions and region IDs, see .
2. After the migration is complete, copy the custom image to the destination Alibaba Cloud region. For more information, see Copy custom images.
3. Create ECS instances by using a custom image. For more information, see Create an ECS instance by using a custom image.By default, root logon by using Secure Shell (SSH) is disabled in AWS VMs. You can log on to Alibaba Cloud by using an AWS account and SSH key.

Migrate AWS VMs to Alibaba Cloud

Create an Alibaba Cloud account. For more information, see Before you begin.

1. Download and decompress the SMC client package.
   i. Download the SMC client package.If the migration source has access to the Internet, you can also download the SMC client package to the migration source.

   > Note You can log on to the SMC console. In the upper-right corner of the page, click Download Latest SMC Client to download the latest version of the SMC client.

   ii. Upload the SMC client package to the migration source.
   - You can build an FTP site to upload files. For more information, see Manually build an FTP site on a Windows instance or Manually build an FTP site on a CentOS 7 instance.
   - You can also use a remote connection tool that supports file transfer. This allows you to upload the SMC client package to the migration source.

   iii. Decompress the SMC client package.The SMC client is available for Windows and Linux of the 32-bit version (i386) and the 64-bit version (x86_64). Select the version that is compatible with the migration source. The following figure shows the decompressed client folders for Windows.

   > Note Linux systems run the unzip <name of the SMC client package> command. This allows you to decompress the SMC client package. Make sure that the unzip utility is installed on the source server. For example, the installation command for CentOS 7 is yum -y install unzip.

iv. Decompress the client package that is compatible with the operating system of your source server.The following figure shows the directories and files in the decompressed folder.

SMC client folders and files

Folder or file	Description
go2aliyun_client.exe	The executable file of the command-line interface (CLI) program for Windows.
go2aliyun_gui.exe	The executable file of the graphical user interface (GUI) program for Windows. For more information, see Use the Windows GUI version of an SMC client.
go2aliyun_client	The executable file of the CLI program for Linux.
user_config.json	The configuration file of the migration source and destination.
Excludes	The folder of the files and directories that are excluded from migration.
client_data	The migration data file. This includes the intermediate instance information and migration progress.

2. Optional. Exclude files or directories from migration.

> **Note** If the source server supports block replication, you cannot exclude files or directories from migration.

The configuration files are located in the *Excludes* directory of the SMC client. If a configuration file is lost or deleted by accident, you can create another one.

- System disk configuration file: *rsync_excludes_win.txt* (for Windows servers) or *rsync_excludes_linux.txt* (for Linux servers)
- Data disk configuration file: named by adding a suffix *disk [disk index number]* to the system disk, for example, *rsync_excludes_win_disk1.txt* (for Windows servers) or *rsync_excludes_linux_disk1.txt* (for Linux servers)
- Example 1: Exclude files or directories from migration of a Windows server
  - System disk
    - Specify the files or directories to be excluded:

```
C:\MyDirs\Docs\Words
C:\MyDirs\Docs\Excels\Report1.txt
```

- Add the following information to the *rsync_excludes_win.txt* file:

```
/MyDirs/Docs/Words/
/MyDirs/Docs/Excels/Report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

```
D:\MyDirs2\Docs2\Words2
D:\MyDirs2\Docs2\Excels\Report2.txt
```

  - Add the following information to the *rsync_excludes_win_disk1.txt* file:

```
/MyDirs2/Docs2/Words2/
/MyDirs2/Docs2/Excels2/Report2.txt
```

> **Note**
>
> To exclude a Windows directory, perform the following operations:
>
> - Remove the prefix of the directory (scr_path). In the preceding example, you must remove `D:`.
> - Replace `\` with `/`.

- Example 2: Exclude files or directories from migration of a Linux server
  - System disk (root directory/):
    - Specify the files or directories to be excluded:

```
/var/mydirs/docs/words
/var/mydirs/docs/excels/report1.txt
```

    - Add the following information to the *rsync_excludes_linux.txt* file:

```
/var/mydirs/docs/words/
/var/mydirs/docs/excels/report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

    ```
    /mnt/disk1/mydirs2/docs2/words2
    /mnt/disk1/mydirs2/docs2/excels2/report2.txt
    ```

  - Add the following information to the *rsync_excludes_linux_disk1.txt* file:

    ```
    /mydirs2/docs2/words2/
    /mydirs2/docs2/excels2/report2.txt
    ```

> **Note** To exclude a Linux directory, you must remove the prefix of the directory (scr_path). In the preceding example, you must remove */mnt/disk1*.

3. Run the SMC client to import the migration source information.
   i. Enter the SMC client folder and run the SMC client.
   - For Windows servers, use one of the following methods to run the SMC client:
     - To run the Windows GUI version, double-click the *go2aliyun_gui.exe* file.
     - To run the Windows CLI version, double-click the *go2aliyun_client.exe* file.

> **Note** When you run the program, you must click **OK** to confirm that you have the administrator privilege.

- For Linux servers, run the SMC client as a root or sudo user.
  - In the directory of the *go2aliyun_client* file, run the following commands as a root user:

    ```
    chmod +x go2aliyun_client
    ```

    ```
    ./go2aliyun_client
    ```

  - In the directory of the *go2aliyun_client* file, run the following commands as a sudo user:

    ```
    sudo chmod +x ./go2aliyun_client
    ```

    ```
    sudo ./go2aliyun_client
    ```

  If you have required permissions on the migration source system, you can also run the following commands to import the migration source information. In this case, you do not need to enter your AccessKey pair.

  - Run the following command as a root user:

    ```
    ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

  - Run the following command as a sudo user:

    ```
    sudo ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

ii. Enter the AccessKey pair of your Alibaba Cloud account.

> Note If the AccessKey pair you entered is invalid, open the *user_config.json* file, delete the access_id and secret_key values, and then run the client again.

- For Windows servers
  - If you use the Windows GUI version, enter the **AccessKey ID** in the **Access Id** field, enter the *AccessKey secret* in the *Secret Key* field, and then click **Start**. For more information, see Use the Windows GUI version of the SMC client.
  - If you use the Windows CLI version, enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.
- For Linux servers

  Enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.

  

  The following prompts may appear:

  - The rsync tool is installed in most mainstream migration sources. If rsync is not installed on the migration source, the SMC client displays a prompt. Enter *yes* to install rsync, as shown in the following figure.

    
  - If SELinux is enabled on the migration source, you are prompted to disable SELinux. Enter *yes* to disable SELinux, as shown in the following figure.

    

> Notice Do not close the client until the migration is complete. Otherwise, the migration source will be disconnected from the SMC console and the migration fails.

4. Log on to the SMC console.
5. Create a migration task.
   i. In the left-side navigation pane, click **Migration Sources**.
   ii. Find the migration source that you want to migrate.You can obtain the ID of the target migration source from the SMC client, as shown in the following figure. Then, you can use the ID to find the target migration source in the SMC console. For more information, see the "How do I find a migration source in the SMC console?" section in SMC FAQ.

   

   iii. Click **Create Migration Task** in the Actions column.
   iv. In the **Create Migration Task** pane, read migration instructions and configure migration task parameters.

   The **Basic configuration** section includes the following parameters:

   - **Target Region**: required. The ID of the destination region. For more information about Alibaba Cloud regions, seeRegions and zones.

- **Task name**: the name of the migration task.

  > **Note** The task name must be unique in the destination region.

- **Description**: the description of the migration task.
- **Target Disk Size (GiB)**: the disk configuration of the destination server.

  The following table describes the parameters.

Parameter	Required	Description
Enable Block Replication	No	■ Selected: Block replication ensures a stable data transmission rate during migration. This also ensures that the source and destination disks use the same partitioning scheme. You cannot modify the size of each partition in the destination disk. When you enable block replication, the **Whether to enable block replication** switch appears next to **Partition <N>**. ■ Cleared: SMC uses the default method to migrate the migration source. You can modify the size of each partition in the destination disk.

Parameter	Required	Description
System Disk	Yes	■ **System Disk**: the system disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 500. The size of the destination system disk must be greater than that of data in the source system disk. For example, if the total size of the source system disk is 500 GiB but the size of data stored in this disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. **Note** The default value of this parameter is the size of the source system disk. We recommend that you retain the default value or specify a greater value. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination system disk based on that of the source system disk. Unit: GiB. Valid values: 0 to 98. `N` indicates the serial number of the partition. For example, if the system disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level.

Parameter	Required	Description
Data Disk <N>	No	■ **Data Disk <N>**: the data disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 32768. ■ If you select the **Data Disk <N>** check box, a destination data disk is generated. ■ `N` indicates the serial number of the data disk. ■ The size of the destination data disk must be greater than that of existing data in the source data disk. For example, if the total size of the source data disk is 500 GiB but the size of data stored in the disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination data disk based on that of the source data disk. Unit: GiB. Valid values: 0 to 141. `N` indicates the serial number of the partition. For example, if a data disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level. Note **Data Disk <N>** is available only if the migration source has a data disk. For more information, see Why are no data disk parameters displayed in the Create Migration Task pane? How can I resolve this issue?

■ **Target Image Type**: the type of the destination image. Valid values:

- **ECS Image.** The following table describes the parameters.

Parameter	Required	Description
Image Name	No	Specifies the name of the destination ECS image generated by SMC for the migration source. Note The image name must be unique in the destination region.
Automatic incremental synchronization	No	Specifies whether SMC automatically synchronizes incremental data of the migration source to Alibaba Cloud. ■ To enable this feature, you must configure the following parameters: ■ **Synchronization Interval**: the interval at which SMC automatically synchronizes incremental data to Alibaba Cloud ■ **Maximum mirror retention**: the maximum number of images that can be retained during incremental migration SMC automatically synchronizes incremental data to Alibaba Cloud at the specified interval. For more information about best practices for incremental migration, see Migrate incremental data from a source server. ■ If you disable this feature, incremental data is not synchronized.

- **Container Image.** The following table describes the parameters.

Note SMC does not allow you to migrate Windows servers to Container Registry. For more information, see Migrate source servers to Container Registry.

Parameter	Required	Description
Namespace	Yes	The namespace of the destination container image
Repository Name	Yes	The name of the repository that stores the destination container image
Version	No	The version of the destination container image
RAM Role	Yes	The instance RAM role that is attached to the intermediate instance

- **Method to Run**: specifies whether to run a task immediately after it is created and whether to automatically run the task.
  - **Run Now**: The migration task runs immediately after it is created.
  - **Run Later**: The migration task automatically runs at the specified time after it is created.

    > **Note** The earliest time that you can specify to run a migration task is 10 minutes after its creation.

  - **Create Only**: After the task is created, you must manually start the task.

  Default value: **Run Now**.

Tag and Network (Optional):

- **Migration Task Tag**: the tags that you specify for the migration task. Each tag contains a key and a value. You can use tags to query and manage migration tasks.

  > **Note** You can specify a maximum of 20 tags for a migration task.

- **Network Type**: the type of the network that is used to migrate data to an intermediate instance. During migration, SMC creates an intermediate instance that connects to a VSwitch in a virtual private cloud (VPC). When you select Public Network, a public IP address is assigned to the intermediate instance.

  The following table describes the valid values.

Parameter value	Description

Parameter value	Description
Public Network	SMC migrates data to the intermediate instance over the Internet. If you select Public Network, make sure that the migration source can access the Internet. You can choose whether to specify a VPC and a VSwitch based on your requirements. ■ If you specify a VPC and a VSwitch, SMC creates an intermediate instance that connects to the specified VPC and VSwitch. When you migrate multiple migration sources at a time, you can specify the same VPC and VSwitch for migration tasks. This improves the usage of VPC resources. You can migrate a maximum of 100 migration sources at a time. ■ If you do not specify a VPC or a VSwitch, SMC automatically creates a VPC and a VSwitch and creates an intermediate instance that connects to the VPC and the VSwitch. If you do not specify a VPC or a VSwitch before you migrate multiple migration sources at a time, SMC creates a VPC for each intermediate instance. Note Each Alibaba Cloud account can have a maximum of 10 VPCs in a region, including the VPCs that you create and the VPCs that are automatically created by SMC. Therefore, you can migrate a maximum of 10 migration sources at a time. To increase the VPC quota, submit a ticket.
VPC	SMC migrates data to the intermediate instance through a VPC. If you select VPC, you must specify a VPC and a VSwitch and make sure that the migration source can connect to the VPC. Note If your server in the on-premises data center, virtual machine, or cloud host can connect to a VPC, we recommend that you select this mode to migrate data. Compared with data migration over the Internet, VPC-based data migration is more efficient and stable. You can use VPN Gateway, Express Connect, and Smart Access Gateway to connect a migration source to a VPC. For more information, see Connect an on-premises data center to a VPC network.

Advanced Settings (Optional):

- **Transmission speed limit (KB/S)**: the maximum bandwidth for data transmission during migration. Unit: Kbit/s.

  The default value is 0, which indicates that the bandwidth is not limited.

- **Compression Level**: the compression ratio of data to be migrated. Set the compression ratio based on your requirements.
  - If the bandwidth is limited, a high compression ratio improves the transmission efficiency.
  - If a high bandwidth is available, we recommend that you do not compress data. Data compression consumes CPU resources of the migration source.

  The default value is 0, which indicates that data to be migrated is not compressed.
- **Checksum**: This feature enhances the verification of data consistency between the migration source and the destination server, but may compromise the data transmission rate.

  By default, this feature is disabled.

v. After the configuration is complete, click **OK**.

6. Start the migration task.

> **Note** If you set the Method to Run parameter to **Run Now**, skip this step. If you set the Method to Run parameter to **Create Only** or **Run Later**, you can perform the following steps to start the migration task.

i. In the left-side navigation pane, click **Migration Tasks**.

ii. Find the target migration task and click **Start** in the Actions column.
   - To start multiple migration tasks at a time, select the target tasks and click **Start/Retry** in the lower part of the Migration Tasks page. The status of the selected tasks must be **Ready**, **Stopped**, or **Error**.
   - To suspend a migration task in the **Syncing** state, click **Pause** in the **Actions** column.

After the migration is complete, perform the following operations based on the destination image type:

- ECS image: Create ECS instances by using a custom image. For more information, see Create an ECS instance by using a custom image.
- Container image: Deploy applications by using the container image. For more information, see Migrate source servers to Container Registry.

8.5. Migrate Azure VMs to Alibaba Cloud

This topic describes how to migrate Azure virtual machines (VMs) to Alibaba Cloud.

Context

Before the migration, complete the preparations based on the operating system of the VM. For more information, see the following topics:

- Prepare for the migration of a Windows-based Azure VM to Alibaba Cloud
- Prepare for the migration of a Linux-based Azure VM to Alibaba Cloud

After the preparations are complete, you can start the migration. If you migrate a VM for the first time, we recommend that you perform a test migration.

Prepare for the migration of a Windows-based Azure VM to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.
- Check the network environment.
  - For information about how to perform migration across regions outside mainland China, see Migrate Azure VMs to Alibaba Cloud across regions outside mainland China.
  - If a VPC network is available, we recommend that you perform migration over the VPC network. Compared with migration over the Internet, migration over the VPC is more efficient and stable.
- Make sure that the Volume Shadow Copy Service (VSS) is enabled.
- Check whether the QEMU Guest Agent is installed. If the QEMU Guest Agent is installed, you must uninstall it. For information about how to uninstall the QEMU Guest Agent, see SMC FAQ.
-

Prepare for the migration of a Linux-based Azure VM to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Check the network environment.
  - For information about how to perform migration across regions outside mainland China, see Migrate Azure VMs to Alibaba Cloud across regions outside mainland China.
  - If a VPC network is available, we recommend that you perform migration over the VPC network. Compared with migration over the Internet, migration over the VPC is more efficient and stable.
- Check cloud-init configurations. For more information, see Install cloud-init.
- Check the version of GRand Unified Bootloader (GRUB). For earlier kernel versions such as CentOS 5, Red Hat 5, and Debian 7, you must upgrade GRUB to version 1.99 or later. For more information, see Install GRUB in a Linux server.

Migrate Azure VMs to Alibaba Cloud across regions outside mainland China

Perform the following operations to migrate Azure VMs to Alibaba Cloud and create Elastic Compute Service (ECS) instances based on a custom image.

1. Migrate Azure VMs to Alibaba Cloud across regions outside mainland China. Select ECS Image as the destination image type. For more information, see the section Migrate Azure VMs to Alibaba Cloud.If an Azure VM resides in the United States, you can migrate the VM to an

Alibaba Cloud region in the United States. For information about regions and region IDs, see .

2. After the migration is complete, copy the custom image to the destination Alibaba Cloud region. For more information, see Copy custom images.
3. Create ECS instances by using a custom image. For more information, see Create an ECS instance by using a custom image.

Migrate Azure VMs to Alibaba Cloud

Create an Alibaba Cloud account. For more information, see Before you begin.

1. Download and decompress the SMC client package.
   i. Download the SMC client package.If the migration source has access to the Internet, you can also download the SMC client package to the migration source.

   > Note You can log on to the SMC console. In the upper-right corner of the page, click Download Latest SMC Client to download the latest version of the SMC client.

   ii. Upload the SMC client package to the migration source.
   - You can build an FTP site to upload files. For more information, see Manually build an FTP site on a Windows instance or Manually build an FTP site on a CentOS 7 instance.
   - You can also use a remote connection tool that supports file transfer. This allows you to upload the SMC client package to the migration source.

   iii. Decompress the SMC client package.The SMC client is available for Windows and Linux of the 32-bit version (i386) and the 64-bit version (x86_64). Select the version that is compatible with the migration source. The following figure shows the decompressed client folders for Windows.

   > Note Linux systems run the unzip <name of the SMC client package> command. This allows you to decompress the SMC client package. Make sure that the unzip utility is installed on the source server. For example, the installation command for CentOS 7 is yum -y install unzip.

iv. Decompress the client package that is compatible with the operating system of your source server.The following figure shows the directories and files in the decompressed folder.

SMC client folders and files

Folder or file	Description
go2aliyun_client.exe	The executable file of the command-line interface (CLI) program for Windows.
go2aliyun_gui.exe	The executable file of the graphical user interface (GUI) program for Windows. For more information, see Use the Windows GUI version of an SMC client.
go2aliyun_client	The executable file of the CLI program for Linux.
user_config.json	The configuration file of the migration source and destination.
Excludes	The folder of the files and directories that are excluded from migration.
client_data	The migration data file. This includes the intermediate instance information and migration progress.

2. Optional. Exclude files or directories from migration.

> **Note** If the source server supports block replication, you cannot exclude files or directories from migration.

The configuration files are located in the *Excludes* directory of the SMC client. If a configuration file is lost or deleted by accident, you can create another one.

- System disk configuration file: *rsync_excludes_win.txt* (for Windows servers) or *rsync_excludes_linux.txt* (for Linux servers)
- Data disk configuration file: named by adding a suffix *disk [disk index number]* to the system disk, for example, *rsync_excludes_win_disk1.txt* (for Windows servers) or *rsync_excludes_linux_disk1.txt* (for Linux servers)
- Example 1: Exclude files or directories from migration of a Windows server
  - System disk
    - Specify the files or directories to be excluded:

```
C:\MyDirs\Docs\Words
C:\MyDirs\Docs\Excels\Report1.txt
```

- Add the following information to the *rsync_excludes_win.txt* file:

```
/MyDirs/Docs/Words/
/MyDirs/Docs/Excels/Report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

```
D:\MyDirs2\Docs2\Words2
D:\MyDirs2\Docs2\Excels\Report2.txt
```

  - Add the following information to the *rsync_excludes_win_disk1.txt* file:

```
/MyDirs2/Docs2/Words2/
/MyDirs2/Docs2/Excels2/Report2.txt
```

> **Note**
>
> To exclude a Windows directory, perform the following operations:
>
> - Remove the prefix of the directory (scr_path). In the preceding example, you must remove `D:`.
> - Replace `\` with `/`.

- Example 2: Exclude files or directories from migration of a Linux server
  - System disk (root directory/):
    - Specify the files or directories to be excluded:

```
/var/mydirs/docs/words
/var/mydirs/docs/excels/report1.txt
```

    - Add the following information to the *rsync_excludes_linux.txt* file:

```
/var/mydirs/docs/words/
/var/mydirs/docs/excels/report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

    ```
    /mnt/disk1/mydirs2/docs2/words2
    /mnt/disk1/mydirs2/docs2/excels2/report2.txt
    ```

  - Add the following information to the *rsync_excludes_linux_disk1.txt* file:

    ```
    /mydirs2/docs2/words2/
    /mydirs2/docs2/excels2/report2.txt
    ```

  > **Note** To exclude a Linux directory, you must remove the prefix of the directory (scr_path). In the preceding example, you must remove */mnt/disk1*.

3. Run the SMC client to import the migration source information.
   i. Enter the SMC client folder and run the SMC client.
   - For Windows servers, use one of the following methods to run the SMC client:
     - To run the Windows GUI version, double-click the *go2aliyun_gui.exe* file.
     - To run the Windows CLI version, double-click the *go2aliyun_client.exe* file.

     > **Note** When you run the program, you must click **OK** to confirm that you have the administrator privilege.

- For Linux servers, run the SMC client as a root or sudo user.
  - In the directory of the *go2aliyun_client* file, run the following commands as a root user:

    ```
    chmod +x go2aliyun_client
    ```

    ```
    ./go2aliyun_client
    ```

  - In the directory of the *go2aliyun_client* file, run the following commands as a sudo user:

    ```
    sudo chmod +x ./go2aliyun_client
    ```

    ```
    sudo ./go2aliyun_client
    ```

  If you have required permissions on the migration source system, you can also run the following commands to import the migration source information. In this case, you do not need to enter your AccessKey pair.

  - Run the following command as a root user:

    ```
    ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

  - Run the following command as a sudo user:

    ```
    sudo ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

ii. Enter the AccessKey pair of your Alibaba Cloud account.

> Note If the AccessKey pair you entered is invalid, open the *user_config.json* file, delete the access_id and secret_key values, and then run the client again.

- For Windows servers
  - If you use the Windows GUI version, enter the **AccessKey ID** in the **Access Id** field, enter the *AccessKey secret* in the *Secret Key* field, and then click **Start**. For more information, see Use the Windows GUI version of the SMC client.
  - If you use the Windows CLI version, enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.
- For Linux servers

  Enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.

  

  The following prompts may appear:
  - The rsync tool is installed in most mainstream migration sources. If rsync is not installed on the migration source, the SMC client displays a prompt. Enter *yes* to install rsync, as shown in the following figure.

    
  - If SELinux is enabled on the migration source, you are prompted to disable SELinux. Enter *yes* to disable SELinux, as shown in the following figure.

    

> Notice Do not close the client until the migration is complete. Otherwise, the migration source will be disconnected from the SMC console and the migration fails.

4. Log on to the SMC console.
5. Create a migration task.
   i. In the left-side navigation pane, click **Migration Sources**.
   ii. Find the migration source that you want to migrate.You can obtain the ID of the target migration source from the SMC client, as shown in the following figure. Then, you can use the ID to find the target migration source in the SMC console. For more information, see the "How do I find a migration source in the SMC console?" section in SMC FAQ.

   

   iii. Click **Create Migration Task** in the Actions column.
   iv. In the **Create Migration Task** pane, read migration instructions and configure migration task parameters.

   The **Basic configuration** section includes the following parameters:
   - **Target Region**: required. The ID of the destination region. For more information about Alibaba Cloud regions, seeRegions and zones.

- **Task name**: the name of the migration task.

  > **Note** The task name must be unique in the destination region.

- **Description**: the description of the migration task.
- **Target Disk Size (GiB)**: the disk configuration of the destination server.

  The following table describes the parameters.

Parameter	Required	Description
Enable Block Replication	No	■ Selected: Block replication ensures a stable data transmission rate during migration. This also ensures that the source and destination disks use the same partitioning scheme. You cannot modify the size of each partition in the destination disk. When you enable block replication, the **Whether to enable block replication** switch appears next to **Partition <N>**. ■ Cleared: SMC uses the default method to migrate the migration source. You can modify the size of each partition in the destination disk.

Parameter	Required	Description
System Disk	Yes	■ **System Disk**: the system disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 500. The size of the destination system disk must be greater than that of data in the source system disk. For example, if the total size of the source system disk is 500 GiB but the size of data stored in this disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. **Note** The default value of this parameter is the size of the source system disk. We recommend that you retain the default value or specify a greater value. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination system disk based on that of the source system disk. Unit: GiB. Valid values: 0 to 98. `N` indicates the serial number of the partition. For example, if the system disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level.

Parameter	Required	Description
Data Disk <N>	No	■ **Data Disk <N>**: the data disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 32768. ■ If you select the **Data Disk <N>** check box, a destination data disk is generated. ■ `N` indicates the serial number of the data disk. ■ The size of the destination data disk must be greater than that of existing data in the source data disk. For example, if the total size of the source data disk is 500 GiB but the size of data stored in the disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination data disk based on that of the source data disk. Unit: GiB. Valid values: 0 to 141. `N` indicates the serial number of the partition. For example, if a data disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level. Note **Data Disk <N>** is available only if the migration source has a data disk. For more information, see Why are no data disk parameters displayed in the Create Migration Task pane? How can I resolve this issue?

■ **Target Image Type**: the type of the destination image. Valid values:

- **ECS Image.** The following table describes the parameters.

Parameter	Required	Description
Image Name	No	Specifies the name of the destination ECS image generated by SMC for the migration source. Note The image name must be unique in the destination region.
Automatic incremental synchronization	No	Specifies whether SMC automatically synchronizes incremental data of the migration source to Alibaba Cloud. ■ To enable this feature, you must configure the following parameters: ■ **Synchronization Interval**: the interval at which SMC automatically synchronizes incremental data to Alibaba Cloud ■ **Maximum mirror retention**: the maximum number of images that can be retained during incremental migration SMC automatically synchronizes incremental data to Alibaba Cloud at the specified interval. For more information about best practices for incremental migration, see Migrate incremental data from a source server. ■ If you disable this feature, incremental data is not synchronized.

- **Container Image.** The following table describes the parameters.

Note SMC does not allow you to migrate Windows servers to Container Registry. For more information, see Migrate source servers to Container Registry.

Parameter	Required	Description
Namespace	Yes	The namespace of the destination container image
Repository Name	Yes	The name of the repository that stores the destination container image
Version	No	The version of the destination container image
RAM Role	Yes	The instance RAM role that is attached to the intermediate instance

- **Method to Run**: specifies whether to run a task immediately after it is created and whether to automatically run the task.
  - **Run Now**: The migration task runs immediately after it is created.
  - **Run Later**: The migration task automatically runs at the specified time after it is created.

    > **Note** The earliest time that you can specify to run a migration task is 10 minutes after its creation.

  - **Create Only**: After the task is created, you must manually start the task.

  Default value: **Run Now**.

Tag and Network (Optional):

- **Migration Task Tag**: the tags that you specify for the migration task. Each tag contains a key and a value. You can use tags to query and manage migration tasks.

  > **Note** You can specify a maximum of 20 tags for a migration task.

- **Network Type**: the type of the network that is used to migrate data to an intermediate instance. During migration, SMC creates an intermediate instance that connects to a VSwitch in a virtual private cloud (VPC). When you select Public Network, a public IP address is assigned to the intermediate instance.

  The following table describes the valid values.

Parameter value	Description

Parameter value	Description
Public Network	SMC migrates data to the intermediate instance over the Internet. If you select Public Network, make sure that the migration source can access the Internet. You can choose whether to specify a VPC and a VSwitch based on your requirements. ■ If you specify a VPC and a VSwitch, SMC creates an intermediate instance that connects to the specified VPC and VSwitch. When you migrate multiple migration sources at a time, you can specify the same VPC and VSwitch for migration tasks. This improves the usage of VPC resources. You can migrate a maximum of 100 migration sources at a time. ■ If you do not specify a VPC or a VSwitch, SMC automatically creates a VPC and a VSwitch and creates an intermediate instance that connects to the VPC and the VSwitch. If you do not specify a VPC or a VSwitch before you migrate multiple migration sources at a time, SMC creates a VPC for each intermediate instance. Note Each Alibaba Cloud account can have a maximum of 10 VPCs in a region, including the VPCs that you create and the VPCs that are automatically created by SMC. Therefore, you can migrate a maximum of 10 migration sources at a time. To increase the VPC quota, submit a ticket.
VPC	SMC migrates data to the intermediate instance through a VPC. If you select VPC, you must specify a VPC and a VSwitch and make sure that the migration source can connect to the VPC. Note If your server in the on-premises data center, virtual machine, or cloud host can connect to a VPC, we recommend that you select this mode to migrate data. Compared with data migration over the Internet, VPC-based data migration is more efficient and stable. You can use VPN Gateway, Express Connect, and Smart Access Gateway to connect a migration source to a VPC. For more information, see Connect an on-premises data center to a VPC network.

Advanced Settings (Optional):

- **Transmission speed limit (KB/S)**: the maximum bandwidth for data transmission during migration. Unit: Kbit/s.

  The default value is 0, which indicates that the bandwidth is not limited.

- **Compression Level**: the compression ratio of data to be migrated. Set the compression ratio based on your requirements.
  - If the bandwidth is limited, a high compression ratio improves the transmission efficiency.
  - If a high bandwidth is available, we recommend that you do not compress data. Data compression consumes CPU resources of the migration source.

  The default value is 0, which indicates that data to be migrated is not compressed.
- **Checksum**: This feature enhances the verification of data consistency between the migration source and the destination server, but may compromise the data transmission rate.

  By default, this feature is disabled.

v. After the configuration is complete, click **OK**.

6. Start the migration task.

> **Note** If you set the Method to Run parameter to **Run Now**, skip this step. If you set the Method to Run parameter to **Create Only** or **Run Later**, you can perform the following steps to start the migration task.

i. In the left-side navigation pane, click **Migration Tasks**.

ii. Find the target migration task and click **Start** in the Actions column.

- To start multiple migration tasks at a time, select the target tasks and click **Start/Retry** in the lower part of the Migration Tasks page. The status of the selected tasks must be **Ready**, **Stopped**, or **Error**.
- To suspend a migration task in the **Syncing** state, click **Pause** in the **Actions** column.

After the migration is complete, perform the following operations based on the destination image type:

- ECS image: Create ECS instances by using a custom image. For more information, see Create an ECS instance by using a custom image.
- Container image: Deploy applications by using the container image. For more information, see Migrate source servers to Container Registry.

8.6. Migrate Google Cloud VMs to Alibaba Cloud

This topic describes how to migrate Google Cloud virtual machines (VMs) to Alibaba Cloud.

Context

Before the migration, complete the following preparations based on the operating system of the VM. For more information, see the following topics:

- Prepare for the migration of a Windows-based Google Cloud VM to Alibaba Cloud
- Prepare for the migration of a Linux-based Google Cloud VM to Alibaba Cloud

After the preparations are complete, you can start the migration. If you migrate a VM for the first time, we recommend that you perform a test migration.

Prepare for the migration of a Windows-based Google Cloud VM to Alibaba Cloud

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.
- Check the network environment.
  - For information about how to perform migration across regions outside mainland China, see Migrate Google Cloud VMs to Alibaba Cloud across regions outside mainland China.
  - If a virtual private cloud (VPC) is available, we recommend that you perform migration over the VPC. Compared with migration over the Internet, migration over a VPC is more efficient and stable.
- Make sure that the Volume Shadow Copy Service (VSS) is enabled.
- Check whether the QEMU Guest Agent is installed. If the QEMU Guest Agent is installed, you must uninstall it. For information about how to uninstall the QEMU Guest Agent, see SMC FAQ.

Prepare for the migration of a Linux-based Google Cloud VM to Alibaba Cloud

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Check Security-Enhanced Linux (SELinux). You need to check whether SELinux is disabled on the Community Enterprise Operating System (CentOS) and Red Hat operating systems. You can use one of the following methods to disable SELinux:
  - Run the **setenforce 0** command to temporarily disable SELinux.
  - Open the configuration file in the */etc/selinux/config* directory, and then set SELINUX to `disabled` to permanently disable SELinux. For more information, see Enable or disable SELinux.
- Check the network environment.
  - For information about how to perform migration across regions outside mainland China, see Migrate Google Cloud VMs to Alibaba Cloud across regions outside mainland China.
  - If a VPC is available, we recommend that you perform migration over the VPC. Compared with migration over the Internet, migration over a VPC is more efficient and stable.
- Check cloud-init configurations. For more information, see Install cloud-init.
- Check the version of GRand Unified Bootloader (GRUB). For earlier kernel versions such as CentOS 5, Red Hat 5, and Debian 7, you must upgrade GRUB to version 1.99 or later. For more information, see Install GRUB in a Linux server.

Migrate Google Cloud VMs to Alibaba Cloud across regions outside mainland China

To migrate a Google Cloud VMs to Alibaba Cloud and create Elastic Compute Service (ECS) instances based on a custom image, perform the following steps:

1. Migrate a Google Cloud VM to Alibaba Cloud across regions outside mainland China. Select ECS Image as the destination image type. For more information, see the "Migrate a Google Cloud VM to Alibaba Cloud" section.For example, if the Google Cloud VM resides in the United States, you can migrate the VM to an Alibaba Cloud region in the United States. For information about regions and region IDs, see Regions and Zones.
2. After the migration is complete, copy the custom image to the destination Alibaba Cloud region. For more information, see Copy custom images.
3. Create ECS instances by using the custom image. For more information, see Create an ECS instance by using a custom image.

Migrate Google Cloud VMs to Alibaba Cloud

Create an Alibaba Cloud account. For more information, see Before you begin.

1. Download and decompress the SMC client package.
   i. Download the SMC client package.If the migration source has access to the Internet, you can also download the SMC client package to the migration source.

      > **Note** You can log on to the SMC console. In the upper-right corner of the page, click **Download Latest SMC Client** to download the latest version of the SMC client.

   ii. Upload the SMC client package to the migration source.
      - You can build an FTP site to upload files. For more information, see Manually build an FTP site on a Windows instance or Manually build an FTP site on a CentOS 7 instance.
      - You can also use a remote connection tool that supports file transfer. This allows you to upload the SMC client package to the migration source.

   iii. Decompress the SMC client package.The SMC client is available for Windows and Linux of the 32-bit version (i386) and the 64-bit version (x86_64). Select the version that is compatible with the migration source. The following figure shows the decompressed client folders for Windows.

      > **Note** Linux systems run the **unzip <name of the SMC client package>** command. This allows you to decompress the SMC client package. Make sure that the **unzip** utility is installed on the source server. For example, the installation command for CentOS 7 is **yum -y install unzip**.

iv. Decompress the client package that is compatible with the operating system of your source server.The following figure shows the directories and files in the decompressed folder.

SMC client folders and files

Folder or file	Description
go2aliyun_client.exe	The executable file of the command-line interface (CLI) program for Windows.
go2aliyun_gui.exe	The executable file of the graphical user interface (GUI) program for Windows. For more information, see Use the Windows GUI version of an SMC client.
go2aliyun_client	The executable file of the CLI program for Linux.
user_config.json	The configuration file of the migration source and destination.
Excludes	The folder of the files and directories that are excluded from migration.
client_data	The migration data file. This includes the intermediate instance information and migration progress.

2. Optional. Exclude files or directories from migration.

> **Note** If the source server supports block replication, you cannot exclude files or directories from migration.

The configuration files are located in the *Excludes* directory of the SMC client. If a configuration file is lost or deleted by accident, you can create another one.

- System disk configuration file: *rsync_excludes_win.txt* (for Windows servers) or *rsync_excludes_linux.txt* (for Linux servers)
- Data disk configuration file: named by adding a suffix *disk [disk index number]* to the system disk, for example, *rsync_excludes_win_disk1.txt* (for Windows servers) or *rsync_excludes_linux_disk1.txt* (for Linux servers)
- Example 1: Exclude files or directories from migration of a Windows server
  - System disk
    - Specify the files or directories to be excluded:

```
C:\MyDirs\Docs\Words
C:\MyDirs\Docs\Excels\Report1.txt
```

- Add the following information to the *rsync_excludes_win.txt* file:

```
/MyDirs/Docs/Words/
/MyDirs/Docs/Excels/Report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

```
D:\MyDirs2\Docs2\Words2
D:\MyDirs2\Docs2\Excels\Report2.txt
```

  - Add the following information to the *rsync_excludes_win_disk1.txt* file:

```
/MyDirs2/Docs2/Words2/
/MyDirs2/Docs2/Excels2/Report2.txt
```

> **Note**
>
> To exclude a Windows directory, perform the following operations:
>
> - Remove the prefix of the directory (scr_path). In the preceding example, you must remove `D:`.
> - Replace `\` with `/`.

- Example 2: Exclude files or directories from migration of a Linux server
  - System disk (root directory/):
    - Specify the files or directories to be excluded:

```
/var/mydirs/docs/words
/var/mydirs/docs/excels/report1.txt
```

    - Add the following information to the *rsync_excludes_linux.txt* file:

```
/var/mydirs/docs/words/
/var/mydirs/docs/excels/report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

    ```
    /mnt/disk1/mydirs2/docs2/words2
    /mnt/disk1/mydirs2/docs2/excels2/report2.txt
    ```

  - Add the following information to the *rsync_excludes_linux_disk1.txt* file:

    ```
    /mydirs2/docs2/words2/
    /mydirs2/docs2/excels2/report2.txt
    ```

> **Note** To exclude a Linux directory, you must remove the prefix of the directory (scr_path). In the preceding example, you must remove */mnt/disk1*.

3. Run the SMC client to import the migration source information.
   i. Enter the SMC client folder and run the SMC client.
   - For Windows servers, use one of the following methods to run the SMC client:
     - To run the Windows GUI version, double-click the *go2aliyun_gui.exe* file.
     - To run the Windows CLI version, double-click the *go2aliyun_client.exe* file.

> **Note** When you run the program, you must click **OK** to confirm that you have the administrator privilege.

- For Linux servers, run the SMC client as a root or sudo user.
  - In the directory of the *go2aliyun_client* file, run the following commands as a root user:

    ```
    chmod +x go2aliyun_client
    ```

    ```
    ./go2aliyun_client
    ```

  - In the directory of the *go2aliyun_client* file, run the following commands as a sudo user:

    ```
    sudo chmod +x ./go2aliyun_client
    ```

    ```
    sudo ./go2aliyun_client
    ```

  If you have required permissions on the migration source system, you can also run the following commands to import the migration source information. In this case, you do not need to enter your AccessKey pair.

  - Run the following command as a root user:

    ```
    ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

  - Run the following command as a sudo user:

    ```
    sudo ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

ii. Enter the AccessKey pair of your Alibaba Cloud account.

> Note If the AccessKey pair you entered is invalid, open the *user_config.json* file, delete the access_id and secret_key values, and then run the client again.

- For Windows servers
  - If you use the Windows GUI version, enter the **AccessKey ID** in the **Access Id** field, enter the *AccessKey secret* in the *Secret Key* field, and then click **Start**. For more information, see Use the Windows GUI version of the SMC client.
  - If you use the Windows CLI version, enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.
- For Linux servers

  Enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.

  

  The following prompts may appear:
  - The rsync tool is installed in most mainstream migration sources. If rsync is not installed on the migration source, the SMC client displays a prompt. Enter *yes* to install rsync, as shown in the following figure.

    
  - If SELinux is enabled on the migration source, you are prompted to disable SELinux. Enter *yes* to disable SELinux, as shown in the following figure.

    

> Notice Do not close the client until the migration is complete. Otherwise, the migration source will be disconnected from the SMC console and the migration fails.

4. Log on to the SMC console.
5. Create a migration task.
   i. In the left-side navigation pane, click **Migration Sources**.
   ii. Find the migration source that you want to migrate.You can obtain the ID of the target migration source from the SMC client, as shown in the following figure. Then, you can use the ID to find the target migration source in the SMC console. For more information, see the "How do I find a migration source in the SMC console?" section in SMC FAQ.

   

   iii. Click **Create Migration Task** in the Actions column.
   iv. In the **Create Migration Task** pane, read migration instructions and configure migration task parameters.

   The **Basic configuration** section includes the following parameters:
   - **Target Region**: required. The ID of the destination region. For more information about Alibaba Cloud regions, seeRegions and zones.

- **Task name**: the name of the migration task.

  > **Note** The task name must be unique in the destination region.

- **Description**: the description of the migration task.
- **Target Disk Size (GiB)**: the disk configuration of the destination server.

  The following table describes the parameters.

Parameter	Required	Description
Enable Block Replication	No	■ Selected: Block replication ensures a stable data transmission rate during migration. This also ensures that the source and destination disks use the same partitioning scheme. You cannot modify the size of each partition in the destination disk. When you enable block replication, the **Whether to enable block replication** switch appears next to **Partition <N>**. ■ Cleared: SMC uses the default method to migrate the migration source. You can modify the size of each partition in the destination disk.

Parameter	Required	Description
System Disk	Yes	■ **System Disk**: the system disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 500. The size of the destination system disk must be greater than that of data in the source system disk. For example, if the total size of the source system disk is 500 GiB but the size of data stored in this disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. **Note** The default value of this parameter is the size of the source system disk. We recommend that you retain the default value or specify a greater value. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination system disk based on that of the source system disk. Unit: GiB. Valid values: 0 to 98. `N` indicates the serial number of the partition. For example, if the system disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level.

Parameter	Required	Description
Data Disk <N>	No	■ **Data Disk <N>**: the data disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 32768. ■ If you select the **Data Disk <N>** check box, a destination data disk is generated. ■ `N` indicates the serial number of the data disk. ■ The size of the destination data disk must be greater than that of existing data in the source data disk. For example, if the total size of the source data disk is 500 GiB but the size of data stored in the disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination data disk based on that of the source data disk. Unit: GiB. Valid values: 0 to 141. `N` indicates the serial number of the partition. For example, if a data disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level. Note Data Disk <N> is available only if the migration source has a data disk. For more information, see Why are no data disk parameters displayed in the Create Migration Task pane? How can I resolve this issue?

■ **Target Image Type**: the type of the destination image. Valid values:

- **ECS Image.** The following table describes the parameters.

Parameter	Required	Description
Image Name	No	Specifies the name of the destination ECS image generated by SMC for the migration source. Note The image name must be unique in the destination region.
Automatic incremental synchronization	No	Specifies whether SMC automatically synchronizes incremental data of the migration source to Alibaba Cloud. ■ To enable this feature, you must configure the following parameters: ■ **Synchronization Interval**: the interval at which SMC automatically synchronizes incremental data to Alibaba Cloud ■ **Maximum mirror retention**: the maximum number of images that can be retained during incremental migration SMC automatically synchronizes incremental data to Alibaba Cloud at the specified interval. For more information about best practices for incremental migration, see Migrate incremental data from a source server. ■ If you disable this feature, incremental data is not synchronized.

- **Container Image.** The following table describes the parameters.

Note SMC does not allow you to migrate Windows servers to Container Registry. For more information, see Migrate source servers to Container Registry.

Parameter	Required	Description
Namespace	Yes	The namespace of the destination container image
Repository Name	Yes	The name of the repository that stores the destination container image
Version	No	The version of the destination container image
RAM Role	Yes	The instance RAM role that is attached to the intermediate instance

- **Method to Run**: specifies whether to run a task immediately after it is created and whether to automatically run the task.
  - **Run Now**: The migration task runs immediately after it is created.
  - **Run Later**: The migration task automatically runs at the specified time after it is created.

    > **Note** The earliest time that you can specify to run a migration task is 10 minutes after its creation.

  - **Create Only**: After the task is created, you must manually start the task.

  Default value: **Run Now**.

Tag and Network (Optional):

- **Migration Task Tag**: the tags that you specify for the migration task. Each tag contains a key and a value. You can use tags to query and manage migration tasks.

  > **Note** You can specify a maximum of 20 tags for a migration task.

- **Network Type**: the type of the network that is used to migrate data to an intermediate instance. During migration, SMC creates an intermediate instance that connects to a VSwitch in a virtual private cloud (VPC). When you select Public Network, a public IP address is assigned to the intermediate instance.

  The following table describes the valid values.

Parameter value	Description

Parameter value	Description
Public Network	SMC migrates data to the intermediate instance over the Internet. If you select Public Network, make sure that the migration source can access the Internet. You can choose whether to specify a VPC and a VSwitch based on your requirements. ■ If you specify a VPC and a VSwitch, SMC creates an intermediate instance that connects to the specified VPC and VSwitch. When you migrate multiple migration sources at a time, you can specify the same VPC and VSwitch for migration tasks. This improves the usage of VPC resources. You can migrate a maximum of 100 migration sources at a time. ■ If you do not specify a VPC or a VSwitch, SMC automatically creates a VPC and a VSwitch and creates an intermediate instance that connects to the VPC and the VSwitch. If you do not specify a VPC or a VSwitch before you migrate multiple migration sources at a time, SMC creates a VPC for each intermediate instance. Note Each Alibaba Cloud account can have a maximum of 10 VPCs in a region, including the VPCs that you create and the VPCs that are automatically created by SMC. Therefore, you can migrate a maximum of 10 migration sources at a time. To increase the VPC quota, submit a ticket.
VPC	SMC migrates data to the intermediate instance through a VPC. If you select VPC, you must specify a VPC and a VSwitch and make sure that the migration source can connect to the VPC. Note If your server in the on-premises data center, virtual machine, or cloud host can connect to a VPC, we recommend that you select this mode to migrate data. Compared with data migration over the Internet, VPC-based data migration is more efficient and stable. You can use VPN Gateway, Express Connect, and Smart Access Gateway to connect a migration source to a VPC. For more information, see Connect an on-premises data center to a VPC network.

Advanced Settings (Optional):

- **Transmission speed limit (KB/S)**: the maximum bandwidth for data transmission during migration. Unit: Kbit/s.

  The default value is 0, which indicates that the bandwidth is not limited.

- **Compression Level**: the compression ratio of data to be migrated. Set the compression ratio based on your requirements.
  - If the bandwidth is limited, a high compression ratio improves the transmission efficiency.
  - If a high bandwidth is available, we recommend that you do not compress data. Data compression consumes CPU resources of the migration source.

  The default value is 0, which indicates that data to be migrated is not compressed.
- **Checksum**: This feature enhances the verification of data consistency between the migration source and the destination server, but may compromise the data transmission rate.

  By default, this feature is disabled.

v. After the configuration is complete, click **OK**.

6. Start the migration task.

> **Note** If you set the Method to Run parameter to **Run Now**, skip this step. If you set the Method to Run parameter to **Create Only** or **Run Later**, you can perform the following steps to start the migration task.

i. In the left-side navigation pane, click **Migration Tasks**.

ii. Find the target migration task and click **Start** in the Actions column.

- To start multiple migration tasks at a time, select the target tasks and click **Start/Retry** in the lower part of the Migration Tasks page. The status of the selected tasks must be **Ready**, **Stopped**, or **Error**.
- To suspend a migration task in the **Syncing** state, click **Pause** in the **Actions** column.

After the migration is complete, perform the following operations based on the destination image type:

- If your destination image is an ECS image, create ECS instances by using the custom image. For more information, see Create an ECS instance by using a custom image.
- If your destination image is a container image, deploy applications by using the container image. For more information, see Migrate source servers to Container Registry.

8.7. Migrate HUAWEI CLOUD VMs to Alibaba Cloud

This topic describes how to migrate HUAWEI CLOUD virtual machines (VMs) to Alibaba Cloud.

Context

Before the migration, complete the preparations based on the operating system of the VM. For more information, see the following topics:

- Prepare for the migration of a Windows-based HUAWEI CLOUD VM to Alibaba Cloud
- Prepare for the migration of a Linux HUAWEI CLOUD VM to Alibaba Cloud

After the preparations are complete, you can start the migration. For more information, see Migrate HUAWEI CLOUD VMs to Alibaba Cloud. If you migrate a VM for the first time, we recommend that you perform a test migration.

Prepare for the migration of a Windows-based HUAWEI CLOUD VM to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Make sure that the VMWare VM has access to the following URLs and ports:
  - The endpoint `https://smc.aliyuncs.com:443` that is used to access SMC.
  - Ports 8080 and 8703 that are required to connect to the intermediate instance during the migration process.

    > **Note** During the migration, SMC creates, starts, stops, and releases the intermediate instance No_Delete_SMC_Transition_Instance. The default security group of the intermediate instance allows access to ports 8080 and 8703. Both ports are the migration service ports of the intermediate instance.

- Check whether the QEMU Guest Agent VSS Provider service is installed.

  If the QEMU Guest Agent VSS Provider service is installed, find the uninstall.bat script in the *C:\Program Files (x86)\virtio\monitor* directory and run the script to uninstall the service.
- Make sure that the Volume Shadow Copy Service (VSS) is enabled.
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.

Prepare for the migration of a Linux HUAWEI CLOUD VM to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Make sure that the VMWare VM has access to the following URLs and ports:
  - The endpoint `https://smc.aliyuncs.com:443` that is used to access SMC.

- Ports 8080 and 8703 that are required to connect to the intermediate instance during the migration process.

  > **Note** During the migration, SMC creates, starts, stops, and releases the intermediate instance No_Delete_SMC_Transition_Instance. The default security group of the intermediate instance allows access to ports 8080 and 8703. Both ports are the migration service ports of the intermediate instance.

- Make sure that rsync is installed. For more information, see How do I install Rsync?
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.

Migrate HUAWEI CLOUD VMs to Alibaba Cloud

Create an Alibaba Cloud account. For more information, see Before you begin.

1. Download and decompress the SMC client package.
   i. Download the SMC client package.If the migration source has access to the Internet, you can also download the SMC client package to the migration source.

   > **Note** You can log on to the SMC console. In the upper-right corner of the page, click **Download Latest SMC Client** to download the latest version of the SMC client.

   ii. Upload the SMC client package to the migration source.
   - You can build an FTP site to upload files. For more information, see Manually build an FTP site on a Windows instance or Manually build an FTP site on a CentOS 7 instance.
   - You can also use a remote connection tool that supports file transfer. This allows you to upload the SMC client package to the migration source.

   iii. Decompress the SMC client package.The SMC client is available for Windows and Linux of the 32-bit version (i386) and the 64-bit version (x86_64). Select the version that is compatible with the migration source. The following figure shows the decompressed client folders for Windows.

   > **Note** Linux systems run the **unzip <name of the SMC client package>** command. This allows you to decompress the SMC client package. Make sure that the **unzip** utility is installed on the source server. For example, the installation command for CentOS 7 is **yum -y install unzip**.

iv. Decompress the client package that is compatible with the operating system of your source server.The following figure shows the directories and files in the decompressed folder.

SMC client folders and files

Folder or file	Description
go2aliyun_client.exe	The executable file of the command-line interface (CLI) program for Windows.
go2aliyun_gui.exe	The executable file of the graphical user interface (GUI) program for Windows. For more information, see Use the Windows GUI version of an SMC client.
go2aliyun_client	The executable file of the CLI program for Linux.
user_config.json	The configuration file of the migration source and destination.
Excludes	The folder of the files and directories that are excluded from migration.
client_data	The migration data file. This includes the intermediate instance information and migration progress.

2. Optional. Exclude files or directories from migration.

> **Note** If the source server supports block replication, you cannot exclude files or directories from migration.

The configuration files are located in the *Excludes* directory of the SMC client. If a configuration file is lost or deleted by accident, you can create another one.

- System disk configuration file: *rsync_excludes_win.txt* (for Windows servers) or *rsync_excludes_linux.txt* (for Linux servers)
- Data disk configuration file: named by adding a suffix *disk [disk index number]* to the system disk, for example, *rsync_excludes_win_disk1.txt* (for Windows servers) or *rsync_excludes_linux_disk1.txt* (for Linux servers)
- Example 1: Exclude files or directories from migration of a Windows server
  - System disk
    - Specify the files or directories to be excluded:

```
C:\MyDirs\Docs\Words
C:\MyDirs\Docs\Excels\Report1.txt
```

- Add the following information to the *rsync_excludes_win.txt* file:

```
/MyDirs/Docs/Words/
/MyDirs/Docs/Excels/Report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

```
D:\MyDirs2\Docs2\Words2
D:\MyDirs2\Docs2\Excels\Report2.txt
```

  - Add the following information to the *rsync_excludes_win_disk1.txt* file:

```
/MyDirs2/Docs2/Words2/
/MyDirs2/Docs2/Excels2/Report2.txt
```

> **Note**
>
> To exclude a Windows directory, perform the following operations:
>
> - Remove the prefix of the directory (scr_path). In the preceding example, you must remove `D:`.
> - Replace `\` with `/`.

- Example 2: Exclude files or directories from migration of a Linux server
  - System disk (root directory/):
    - Specify the files or directories to be excluded:

```
/var/mydirs/docs/words
/var/mydirs/docs/excels/report1.txt
```

    - Add the following information to the *rsync_excludes_linux.txt* file:

```
/var/mydirs/docs/words/
/var/mydirs/docs/excels/report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

    ```
    /mnt/disk1/mydirs2/docs2/words2
    /mnt/disk1/mydirs2/docs2/excels2/report2.txt
    ```

  - Add the following information to the *rsync_excludes_linux_disk1.txt* file:

    ```
    /mydirs2/docs2/words2/
    /mydirs2/docs2/excels2/report2.txt
    ```

  > **Note** To exclude a Linux directory, you must remove the prefix of the directory (scr_path). In the preceding example, you must remove */mnt/disk1*.

3. Run the SMC client to import the migration source information.
   i. Enter the SMC client folder and run the SMC client.
   - For Windows servers, use one of the following methods to run the SMC client:
     - To run the Windows GUI version, double-click the *go2aliyun_gui.exe* file.
     - To run the Windows CLI version, double-click the *go2aliyun_client.exe* file.

     > **Note** When you run the program, you must click **OK** to confirm that you have the administrator privilege.

- For Linux servers, run the SMC client as a root or sudo user.
  - In the directory of the *go2aliyun_client* file, run the following commands as a root user:

    ```
    chmod +x go2aliyun_client
    ```

    ```
    ./go2aliyun_client
    ```

  - In the directory of the *go2aliyun_client* file, run the following commands as a sudo user:

    ```
    sudo chmod +x ./go2aliyun_client
    ```

    ```
    sudo ./go2aliyun_client
    ```

  If you have required permissions on the migration source system, you can also run the following commands to import the migration source information. In this case, you do not need to enter your AccessKey pair.

  - Run the following command as a root user:

    ```
    ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

  - Run the following command as a sudo user:

    ```
    sudo ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

ii. Enter the AccessKey pair of your Alibaba Cloud account.

> Note If the AccessKey pair you entered is invalid, open the *user_config.json* file, delete the access_id and secret_key values, and then run the client again.

- For Windows servers
  - If you use the Windows GUI version, enter the **AccessKey ID** in the **Access Id** field, enter the *AccessKey secret* in the *Secret Key* field, and then click **Start**. For more information, see Use the Windows GUI version of the SMC client.
  - If you use the Windows CLI version, enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.
- For Linux servers

  Enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.

  

  The following prompts may appear:

  - The rsync tool is installed in most mainstream migration sources. If rsync is not installed on the migration source, the SMC client displays a prompt. Enter *yes* to install rsync, as shown in the following figure.

    
  - If SELinux is enabled on the migration source, you are prompted to disable SELinux. Enter *yes* to disable SELinux, as shown in the following figure.

    

> Notice Do not close the client until the migration is complete. Otherwise, the migration source will be disconnected from the SMC console and the migration fails.

4. Log on to the SMC console.
5. Create a migration task.
   i. In the left-side navigation pane, click **Migration Sources**.
   ii. Find the migration source that you want to migrate.You can obtain the ID of the target migration source from the SMC client, as shown in the following figure. Then, you can use the ID to find the target migration source in the SMC console. For more information, see the "How do I find a migration source in the SMC console?" section in SMC FAQ.

   

   iii. Click **Create Migration Task** in the Actions column.
   iv. In the **Create Migration Task** pane, read migration instructions and configure migration task parameters.

   The **Basic configuration** section includes the following parameters:

   - **Target Region**: required. The ID of the destination region. For more information about Alibaba Cloud regions, seeRegions and zones.

- **Task name**: the name of the migration task.

  > **Note** The task name must be unique in the destination region.

- **Description**: the description of the migration task.
- **Target Disk Size (GiB)**: the disk configuration of the destination server.

  The following table describes the parameters.

Parameter	Required	Description
Enable Block Replication	No	■ Selected: Block replication ensures a stable data transmission rate during migration. This also ensures that the source and destination disks use the same partitioning scheme. You cannot modify the size of each partition in the destination disk. When you enable block replication, the **Whether to enable block replication** switch appears next to **Partition <N>**. ■ Cleared: SMC uses the default method to migrate the migration source. You can modify the size of each partition in the destination disk.

Parameter	Required	Description
System Disk	Yes	■ **System Disk**: the system disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 500. The size of the destination system disk must be greater than that of data in the source system disk. For example, if the total size of the source system disk is 500 GiB but the size of data stored in this disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. **Note** The default value of this parameter is the size of the source system disk. We recommend that you retain the default value or specify a greater value. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination system disk based on that of the source system disk. Unit: GiB. Valid values: 0 to 98. `N` indicates the serial number of the partition. For example, if the system disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level.

Parameter	Required	Description
Data Disk <N>	No	■ **Data Disk <N>**: the data disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 32768. ■ If you select the **Data Disk <N>** check box, a destination data disk is generated. ■ `N` indicates the serial number of the data disk. ■ The size of the destination data disk must be greater than that of existing data in the source data disk. For example, if the total size of the source data disk is 500 GiB but the size of data stored in the disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination data disk based on that of the source data disk. Unit: GiB. Valid values: 0 to 141. `N` indicates the serial number of the partition. For example, if a data disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level. Note Data Disk <N> is available only if the migration source has a data disk. For more information, see Why are no data disk parameters displayed in the Create Migration Task pane? How can I resolve this issue?

■ **Target Image Type**: the type of the destination image. Valid values:

- **ECS Image.** The following table describes the parameters.

Parameter	Required	Description
Image Name	No	Specifies the name of the destination ECS image generated by SMC for the migration source. Note The image name must be unique in the destination region.
Automatic incremental synchronization	No	Specifies whether SMC automatically synchronizes incremental data of the migration source to Alibaba Cloud. ■ To enable this feature, you must configure the following parameters: ■ **Synchronization Interval**: the interval at which SMC automatically synchronizes incremental data to Alibaba Cloud ■ **Maximum mirror retention**: the maximum number of images that can be retained during incremental migration SMC automatically synchronizes incremental data to Alibaba Cloud at the specified interval. For more information about best practices for incremental migration, see Migrate incremental data from a source server. ■ If you disable this feature, incremental data is not synchronized.

- **Container Image.** The following table describes the parameters.

Note SMC does not allow you to migrate Windows servers to Container Registry. For more information, see Migrate source servers to Container Registry.

Parameter	Required	Description
Namespace	Yes	The namespace of the destination container image
Repository Name	Yes	The name of the repository that stores the destination container image
Version	No	The version of the destination container image
RAM Role	Yes	The instance RAM role that is attached to the intermediate instance

- **Method to Run**: specifies whether to run a task immediately after it is created and whether to automatically run the task.
  - **Run Now**: The migration task runs immediately after it is created.
  - **Run Later**: The migration task automatically runs at the specified time after it is created.

    > **Note** The earliest time that you can specify to run a migration task is 10 minutes after its creation.

  - **Create Only**: After the task is created, you must manually start the task.

  Default value: **Run Now**.

Tag and Network (Optional):

- **Migration Task Tag**: the tags that you specify for the migration task. Each tag contains a key and a value. You can use tags to query and manage migration tasks.

  > **Note** You can specify a maximum of 20 tags for a migration task.

- **Network Type**: the type of the network that is used to migrate data to an intermediate instance. During migration, SMC creates an intermediate instance that connects to a VSwitch in a virtual private cloud (VPC). When you select Public Network, a public IP address is assigned to the intermediate instance.

  The following table describes the valid values.

Parameter value	Description

Parameter value	Description
Public Network	SMC migrates data to the intermediate instance over the Internet. If you select Public Network, make sure that the migration source can access the Internet. You can choose whether to specify a VPC and a VSwitch based on your requirements. ■ If you specify a VPC and a VSwitch, SMC creates an intermediate instance that connects to the specified VPC and VSwitch. When you migrate multiple migration sources at a time, you can specify the same VPC and VSwitch for migration tasks. This improves the usage of VPC resources. You can migrate a maximum of 100 migration sources at a time. ■ If you do not specify a VPC or a VSwitch, SMC automatically creates a VPC and a VSwitch and creates an intermediate instance that connects to the VPC and the VSwitch. If you do not specify a VPC or a VSwitch before you migrate multiple migration sources at a time, SMC creates a VPC for each intermediate instance. Note Each Alibaba Cloud account can have a maximum of 10 VPCs in a region, including the VPCs that you create and the VPCs that are automatically created by SMC. Therefore, you can migrate a maximum of 10 migration sources at a time. To increase the VPC quota, submit a ticket.
VPC	SMC migrates data to the intermediate instance through a VPC. If you select VPC, you must specify a VPC and a VSwitch and make sure that the migration source can connect to the VPC. Note If your server in the on-premises data center, virtual machine, or cloud host can connect to a VPC, we recommend that you select this mode to migrate data. Compared with data migration over the Internet, VPC-based data migration is more efficient and stable. You can use VPN Gateway, Express Connect, and Smart Access Gateway to connect a migration source to a VPC. For more information, see Connect an on-premises data center to a VPC network.

Advanced Settings (Optional):

- **Transmission speed limit (KB/S)**: the maximum bandwidth for data transmission during migration. Unit: Kbit/s.

  The default value is 0, which indicates that the bandwidth is not limited.

- **Compression Level**: the compression ratio of data to be migrated. Set the compression ratio based on your requirements.
  - If the bandwidth is limited, a high compression ratio improves the transmission efficiency.
  - If a high bandwidth is available, we recommend that you do not compress data. Data compression consumes CPU resources of the migration source.

  The default value is 0, which indicates that data to be migrated is not compressed.
- **Checksum**: This feature enhances the verification of data consistency between the migration source and the destination server, but may compromise the data transmission rate.

  By default, this feature is disabled.

v. After the configuration is complete, click **OK**.

6. Start the migration task.

> **Note** If you set the Method to Run parameter to **Run Now**, skip this step. If you set the Method to Run parameter to **Create Only** or **Run Later**, you can perform the following steps to start the migration task.

i. In the left-side navigation pane, click **Migration Tasks**.

ii. Find the target migration task and click **Start** in the Actions column.
   - To start multiple migration tasks at a time, select the target tasks and click **Start/Retry** in the lower part of the Migration Tasks page. The status of the selected tasks must be **Ready**, **Stopped**, or **Error**.
   - To suspend a migration task in the **Syncing** state, click **Pause** in the **Actions** column.

What's next

After the migration is complete, perform the following operations based on the destination image type:

- ECS image: Create ECS instances by using a custom image. For more information, see Create an ECS instance by using a custom image.
- Container image: Deploy applications by using the container image. For more information, see Migrate source servers to Container Registry.

8.8. Migrate Tencent Cloud VMs to Alibaba Cloud

This topic describes how to migrate Tencent Cloud virtual machines (VMs) to Alibaba Cloud.

Context

Before the migration, complete the preparations based on the operating system of the VM. For more information, see the following topics:

- Prepare for the migration of a Windows-based Tencent Cloud VM to Alibaba Cloud
- Prepare for the migration of a Linux-based Tencent Cloud VM to Alibaba Cloud

After the preparations are complete, you can start the migration. For more information, see Migrate Tencent Cloud VMs to Alibaba Cloud. If you migrate a VM for the first time, we recommend that you perform a test migration.

Prepare for the migration of a Windows-based Tencent Cloud VM to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Make sure that the VMWare VM has access to the following URLs and ports:
  - The endpoint `https://smc.aliyuncs.com:443` that is used to access SMC.
  - Ports 8080 and 8703 that are required to connect to the intermediate instance during the migration process.

    > **Note** During the migration, SMC creates, starts, stops, and releases the intermediate instance No_Delete_SMC_Transition_Instance. The default security group of the intermediate instance allows access to ports 8080 and 8703. Both ports are the migration service ports of the intermediate instance.

- Make sure that the Volume Shadow Copy Service (VSS) is enabled.
- Check whether the QEMU Guest Agent is installed. If the QEMU Guest Agent is installed, you must uninstall it. For information about how to uninstall the QEMU Guest Agent, see SMC FAQ.
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.

Prepare for the migration of a Linux-based Tencent Cloud VM to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Make sure that the VMWare VM has access to the following URLs and ports:
  - The endpoint `https://smc.aliyuncs.com:443` that is used to access SMC.
  - Ports 8080 and 8703 that are required to connect to the intermediate instance during the migration process.

    > **Note** During the migration, SMC creates, starts, stops, and releases the intermediate instance No_Delete_SMC_Transition_Instance. The default security group of the intermediate instance allows access to ports 8080 and 8703. Both ports are the migration service ports of the intermediate instance.

- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba

Cloud, the application licenses that are associated with the underlying hardware may become invalid.

Migrate Tencent Cloud VMs to Alibaba Cloud

Create an Alibaba Cloud account. For more information, see Before you begin.

1. Download and decompress the SMC client package.
   i. Download the SMC client package.If the migration source has access to the Internet, you can also download the SMC client package to the migration source.

   > Note You can log on to the SMC console. In the upper-right corner of the page, click Download Latest SMC Client to download the latest version of the SMC client.

   ii. Upload the SMC client package to the migration source.
   - You can build an FTP site to upload files. For more information, see Manually build an FTP site on a Windows instance or Manually build an FTP site on a CentOS 7 instance.
   - You can also use a remote connection tool that supports file transfer. This allows you to upload the SMC client package to the migration source.

   iii. Decompress the SMC client package.The SMC client is available for Windows and Linux of the 32-bit version (i386) and the 64-bit version (x86_64). Select the version that is compatible with the migration source. The following figure shows the decompressed client folders for Windows.

   > Note Linux systems run the unzip <name of the SMC client package> command. This allows you to decompress the SMC client package. Make sure that the unzip utility is installed on the source server. For example, the installation command for CentOS 7 is yum -y install unzip.

iv. Decompress the client package that is compatible with the operating system of your source server.The following figure shows the directories and files in the decompressed folder.

SMC client folders and files

Folder or file	Description
go2aliyun_client.exe	The executable file of the command-line interface (CLI) program for Windows.
go2aliyun_gui.exe	The executable file of the graphical user interface (GUI) program for Windows. For more information, see Use the Windows GUI version of an SMC client.
go2aliyun_client	The executable file of the CLI program for Linux.
user_config.json	The configuration file of the migration source and destination.
Excludes	The folder of the files and directories that are excluded from migration.
client_data	The migration data file. This includes the intermediate instance information and migration progress.

2. Optional. Exclude files or directories from migration.

> **Note** If the source server supports block replication, you cannot exclude files or directories from migration.

The configuration files are located in the *Excludes* directory of the SMC client. If a configuration file is lost or deleted by accident, you can create another one.

- System disk configuration file: *rsync_excludes_win.txt* (for Windows servers) or *rsync_excludes_linux.txt* (for Linux servers)
- Data disk configuration file: named by adding a suffix *disk [disk index number]* to the system disk, for example, *rsync_excludes_win_disk1.txt* (for Windows servers) or *rsync_excludes_linux_disk1.txt* (for Linux servers)
- Example 1: Exclude files or directories from migration of a Windows server
  - System disk
    - Specify the files or directories to be excluded:

```
C:\MyDirs\Docs\Words
C:\MyDirs\Docs\Excels\Report1.txt
```

- Add the following information to the *rsync_excludes_win.txt* file:

```
/MyDirs/Docs/Words/
/MyDirs/Docs/Excels/Report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

```
D:\MyDirs2\Docs2\Words2
D:\MyDirs2\Docs2\Excels\Report2.txt
```

  - Add the following information to the *rsync_excludes_win_disk1.txt* file:

```
/MyDirs2/Docs2/Words2/
/MyDirs2/Docs2/Excels2/Report2.txt
```

> **Note**
>
> To exclude a Windows directory, perform the following operations:
>
> - Remove the prefix of the directory (scr_path). In the preceding example, you must remove `D:`.
> - Replace `\` with `/`.

- Example 2: Exclude files or directories from migration of a Linux server
  - System disk (root directory/):
    - Specify the files or directories to be excluded:

```
/var/mydirs/docs/words
/var/mydirs/docs/excels/report1.txt
```

    - Add the following information to the *rsync_excludes_linux.txt* file:

```
/var/mydirs/docs/words/
/var/mydirs/docs/excels/report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

    ```
    /mnt/disk1/mydirs2/docs2/words2
    /mnt/disk1/mydirs2/docs2/excels2/report2.txt
    ```

  - Add the following information to the *rsync_excludes_linux_disk1.txt* file:

    ```
    /mydirs2/docs2/words2/
    /mydirs2/docs2/excels2/report2.txt
    ```

  > **Note** To exclude a Linux directory, you must remove the prefix of the directory (scr_path). In the preceding example, you must remove */mnt/disk1*.

3. Run the SMC client to import the migration source information.
   i. Enter the SMC client folder and run the SMC client.
   - For Windows servers, use one of the following methods to run the SMC client:
     - To run the Windows GUI version, double-click the *go2aliyun_gui.exe* file.
     - To run the Windows CLI version, double-click the *go2aliyun_client.exe* file.

     > **Note** When you run the program, you must click **OK** to confirm that you have the administrator privilege.

- For Linux servers, run the SMC client as a root or sudo user.
  - In the directory of the *go2aliyun_client* file, run the following commands as a root user:

    ```
    chmod +x go2aliyun_client
    ```

    ```
    ./go2aliyun_client
    ```

  - In the directory of the *go2aliyun_client* file, run the following commands as a sudo user:

    ```
    sudo chmod +x ./go2aliyun_client
    ```

    ```
    sudo ./go2aliyun_client
    ```

  If you have required permissions on the migration source system, you can also run the following commands to import the migration source information. In this case, you do not need to enter your AccessKey pair.

  - Run the following command as a root user:

    ```
    ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

  - Run the following command as a sudo user:

    ```
    sudo ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

ii. Enter the AccessKey pair of your Alibaba Cloud account.

> Note If the AccessKey pair you entered is invalid, open the *user_config.json* file, delete the access_id and secret_key values, and then run the client again.

- For Windows servers
  - If you use the Windows GUI version, enter the **AccessKey ID** in the **Access Id** field, enter the *AccessKey secret* in the *Secret Key* field, and then click **Start**. For more information, see Use the Windows GUI version of the SMC client.
  - If you use the Windows CLI version, enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.
- For Linux servers

  Enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.

  

  The following prompts may appear:
  - The rsync tool is installed in most mainstream migration sources. If rsync is not installed on the migration source, the SMC client displays a prompt. Enter *yes* to install rsync, as shown in the following figure.

    
  - If SELinux is enabled on the migration source, you are prompted to disable SELinux. Enter *yes* to disable SELinux, as shown in the following figure.

    

> Notice Do not close the client until the migration is complete. Otherwise, the migration source will be disconnected from the SMC console and the migration fails.

4. Log on to the SMC console.
5. Create a migration task.
   i. In the left-side navigation pane, click **Migration Sources**.
   ii. Find the migration source that you want to migrate.You can obtain the ID of the target migration source from the SMC client, as shown in the following figure. Then, you can use the ID to find the target migration source in the SMC console. For more information, see the "How do I find a migration source in the SMC console?" section in SMC FAQ.

   

   iii. Click **Create Migration Task** in the Actions column.
   iv. In the **Create Migration Task** pane, read migration instructions and configure migration task parameters.

   The **Basic configuration** section includes the following parameters:
   - **Target Region**: required. The ID of the destination region. For more information about Alibaba Cloud regions, seeRegions and zones.

- **Task name**: the name of the migration task.

  > **Note** The task name must be unique in the destination region.

- **Description**: the description of the migration task.
- **Target Disk Size (GiB)**: the disk configuration of the destination server.

  The following table describes the parameters.

Parameter	Required	Description
Enable Block Replication	No	■ Selected: Block replication ensures a stable data transmission rate during migration. This also ensures that the source and destination disks use the same partitioning scheme. You cannot modify the size of each partition in the destination disk. When you enable block replication, the **Whether to enable block replication** switch appears next to **Partition <N>**. ■ Cleared: SMC uses the default method to migrate the migration source. You can modify the size of each partition in the destination disk.

Parameter	Required	Description
System Disk	Yes	■ **System Disk**: the system disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 500. The size of the destination system disk must be greater than that of data in the source system disk. For example, if the total size of the source system disk is 500 GiB but the size of data stored in this disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. **Note** The default value of this parameter is the size of the source system disk. We recommend that you retain the default value or specify a greater value. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination system disk based on that of the source system disk. Unit: GiB. Valid values: 0 to 98. `N` indicates the serial number of the partition. For example, if the system disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level.

Parameter	Required	Description
Data Disk <N>	No	■ **Data Disk <N>**: the data disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 32768. ■ If you select the **Data Disk <N>** check box, a destination data disk is generated. ■ `N` indicates the serial number of the data disk. ■ The size of the destination data disk must be greater than that of existing data in the source data disk. For example, if the total size of the source data disk is 500 GiB but the size of data stored in the disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination data disk based on that of the source data disk. Unit: GiB. Valid values: 0 to 141. `N` indicates the serial number of the partition. For example, if a data disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level. Note Data Disk <N> is available only if the migration source has a data disk. For more information, see Why are no data disk parameters displayed in the Create Migration Task pane? How can I resolve this issue?

■ **Target Image Type**: the type of the destination image. Valid values:

- **ECS Image.** The following table describes the parameters.

Parameter	Required	Description
Image Name	No	Specifies the name of the destination ECS image generated by SMC for the migration source. **Note** The image name must be unique in the destination region.
Automatic incremental synchronization	No	Specifies whether SMC automatically synchronizes incremental data of the migration source to Alibaba Cloud. ■ To enable this feature, you must configure the following parameters: ■ **Synchronization Interval**: the interval at which SMC automatically synchronizes incremental data to Alibaba Cloud ■ **Maximum mirror retention**: the maximum number of images that can be retained during incremental migration SMC automatically synchronizes incremental data to Alibaba Cloud at the specified interval. For more information about best practices for incremental migration, see Migrate incremental data from a source server. ■ If you disable this feature, incremental data is not synchronized.

- **Container Image.** The following table describes the parameters.

Note SMC does not allow you to migrate Windows servers to Container Registry. For more information, see Migrate source servers to Container Registry.

Parameter	Required	Description
Namespace	Yes	The namespace of the destination container image
Repository Name	Yes	The name of the repository that stores the destination container image
Version	No	The version of the destination container image
RAM Role	Yes	The instance RAM role that is attached to the intermediate instance

- **Method to Run**: specifies whether to run a task immediately after it is created and whether to automatically run the task.
  - **Run Now**: The migration task runs immediately after it is created.
  - **Run Later**: The migration task automatically runs at the specified time after it is created.

    > **Note** The earliest time that you can specify to run a migration task is 10 minutes after its creation.

  - **Create Only**: After the task is created, you must manually start the task.

  Default value: **Run Now**.

Tag and Network (Optional):

- **Migration Task Tag**: the tags that you specify for the migration task. Each tag contains a key and a value. You can use tags to query and manage migration tasks.

  > **Note** You can specify a maximum of 20 tags for a migration task.

- **Network Type**: the type of the network that is used to migrate data to an intermediate instance. During migration, SMC creates an intermediate instance that connects to a VSwitch in a virtual private cloud (VPC). When you select Public Network, a public IP address is assigned to the intermediate instance.

  The following table describes the valid values.

Parameter value	Description

Parameter value	Description
Public Network	SMC migrates data to the intermediate instance over the Internet. If you select Public Network, make sure that the migration source can access the Internet. You can choose whether to specify a VPC and a VSwitch based on your requirements. ■ If you specify a VPC and a VSwitch, SMC creates an intermediate instance that connects to the specified VPC and VSwitch. When you migrate multiple migration sources at a time, you can specify the same VPC and VSwitch for migration tasks. This improves the usage of VPC resources. You can migrate a maximum of 100 migration sources at a time. ■ If you do not specify a VPC or a VSwitch, SMC automatically creates a VPC and a VSwitch and creates an intermediate instance that connects to the VPC and the VSwitch. If you do not specify a VPC or a VSwitch before you migrate multiple migration sources at a time, SMC creates a VPC for each intermediate instance. Note Each Alibaba Cloud account can have a maximum of 10 VPCs in a region, including the VPCs that you create and the VPCs that are automatically created by SMC. Therefore, you can migrate a maximum of 10 migration sources at a time. To increase the VPC quota, submit a ticket.
VPC	SMC migrates data to the intermediate instance through a VPC. If you select VPC, you must specify a VPC and a VSwitch and make sure that the migration source can connect to the VPC. Note If your server in the on-premises data center, virtual machine, or cloud host can connect to a VPC, we recommend that you select this mode to migrate data. Compared with data migration over the Internet, VPC-based data migration is more efficient and stable. You can use VPN Gateway, Express Connect, and Smart Access Gateway to connect a migration source to a VPC. For more information, see Connect an on-premises data center to a VPC network.

Advanced Settings (Optional):

- **Transmission speed limit (KB/S)**: the maximum bandwidth for data transmission during migration. Unit: Kbit/s.

  The default value is 0, which indicates that the bandwidth is not limited.

- **Compression Level**: the compression ratio of data to be migrated. Set the compression ratio based on your requirements.
  - If the bandwidth is limited, a high compression ratio improves the transmission efficiency.
  - If a high bandwidth is available, we recommend that you do not compress data. Data compression consumes CPU resources of the migration source.

  The default value is 0, which indicates that data to be migrated is not compressed.
- **Checksum**: This feature enhances the verification of data consistency between the migration source and the destination server, but may compromise the data transmission rate.

  By default, this feature is disabled.

v. After the configuration is complete, click **OK**.

6. Start the migration task.

> **Note** If you set the Method to Run parameter to **Run Now**, skip this step. If you set the Method to Run parameter to **Create Only** or **Run Later**, you can perform the following steps to start the migration task.

i. In the left-side navigation pane, click **Migration Tasks**.

ii. Find the target migration task and click **Start** in the Actions column.
- To start multiple migration tasks at a time, select the target tasks and click **Start/Retry** in the lower part of the Migration Tasks page. The status of the selected tasks must be **Ready**, **Stopped**, or **Error**.
- To suspend a migration task in the **Syncing** state, click **Pause** in the **Actions** column.

What's next

After the migration is complete, perform the following operations based on the destination image type:

- ECS image: Create ECS instances by using a custom image. For more information, see Create an ECS instance by using a custom image.
- Container image: Deploy applications by using the container image. For more information, see Migrate source servers to Container Registry.

8.9. Migrate UCloud VMs to Alibaba Cloud

This topic describes how to migrate UCloud virtual machines (VMs) to Alibaba Cloud.

Context

Before the migration, complete the preparations based on the operating system of the VM. For more information, see the following topics:

- Prepare for the migration of a Windows-based UCloud VM to Alibaba Cloud
- Prepare for the migration of a Linux-based UCloud VM to Alibaba Cloud

After the preparations are complete, you can start the migration. For more information, see Migrate UCloud VMs to Alibaba Cloud. If you migrate a VM for the first time, we recommend that you perform a test migration.

Prepare for the migration of a Windows-based UCloud VM to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Make sure that the VMWare VM has access to the following URLs and ports:
  - The endpoint `https://smc.aliyuncs.com:443` that is used to access SMC.
  - Ports 8080 and 8703 that are required to connect to the intermediate instance during the migration process.

    > **Note** During the migration, SMC creates, starts, stops, and releases the intermediate instance No_Delete_SMC_Transition_Instance. The default security group of the intermediate instance allows access to ports 8080 and 8703. Both ports are the migration service ports of the intermediate instance.

- Make sure that the Volume Shadow Copy Service (VSS) is enabled.
- Check whether the QEMU Guest Agent is installed. If the QEMU Guest Agent is installed, you must uninstall it. For information about how to uninstall the QEMU Guest Agent, see SMC FAQ.
- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.

Prepare for the migration of a Linux-based UCloud VM to Alibaba Cloud

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Make sure that the system time of the VMWare VM is the same as the standard time of the region where the VMWare VM resides.
- Make sure that the VMWare VM has access to the following URLs and ports:
  - The endpoint `https://smc.aliyuncs.com:443` that is used to access SMC.
  - Ports 8080 and 8703 that are required to connect to the intermediate instance during the migration process.

    > **Note** During the migration, SMC creates, starts, stops, and releases the intermediate instance No_Delete_SMC_Transition_Instance. The default security group of the intermediate instance allows access to ports 8080 and 8703. Both ports are the migration service ports of the intermediate instance.

- Check the validity of your application licenses. After you migrate the VMWare VM to Alibaba Cloud, the application licenses that are associated with the underlying hardware may become invalid.

Migrate UCloud VMs to Alibaba Cloud

Create an Alibaba Cloud account. For more information, see Before you begin.

1. Download and decompress the SMC client package.
   i. Download the SMC client package.If the migration source has access to the Internet, you can also download the SMC client package to the migration source.

   > Note You can log on to the SMC console. In the upper-right corner of the page, click Download Latest SMC Client to download the latest version of the SMC client.

   ii. Upload the SMC client package to the migration source.
   - You can build an FTP site to upload files. For more information, see Manually build an FTP site on a Windows instance or Manually build an FTP site on a CentOS 7 instance.
   - You can also use a remote connection tool that supports file transfer. This allows you to upload the SMC client package to the migration source.

   iii. Decompress the SMC client package.The SMC client is available for Windows and Linux of the 32-bit version (i386) and the 64-bit version (x86_64). Select the version that is compatible with the migration source. The following figure shows the decompressed client folders for Windows.

   > Note Linux systems run the unzip <name of the SMC client package> command. This allows you to decompress the SMC client package. Make sure that the unzip utility is installed on the source server. For example, the installation command for CentOS 7 is yum -y install unzip.

iv. Decompress the client package that is compatible with the operating system of your source server.The following figure shows the directories and files in the decompressed folder.

SMC client folders and files

Folder or file	Description
go2aliyun_client.exe	The executable file of the command-line interface (CLI) program for Windows.
go2aliyun_gui.exe	The executable file of the graphical user interface (GUI) program for Windows. For more information, see Use the Windows GUI version of an SMC client.
go2aliyun_client	The executable file of the CLI program for Linux.
user_config.json	The configuration file of the migration source and destination.
Excludes	The folder of the files and directories that are excluded from migration.
client_data	The migration data file. This includes the intermediate instance information and migration progress.

2. Optional. Exclude files or directories from migration.

> **Note** If the source server supports block replication, you cannot exclude files or directories from migration.

The configuration files are located in the *Excludes* directory of the SMC client. If a configuration file is lost or deleted by accident, you can create another one.

- System disk configuration file: *rsync_excludes_win.txt* (for Windows servers) or *rsync_excludes_linux.txt* (for Linux servers)
- Data disk configuration file: named by adding a suffix *disk [disk index number]* to the system disk, for example, *rsync_excludes_win_disk1.txt* (for Windows servers) or *rsync_excludes_linux_disk1.txt* (for Linux servers)
- Example 1: Exclude files or directories from migration of a Windows server
  - System disk
    - Specify the files or directories to be excluded:

```
C:\MyDirs\Docs\Words
C:\MyDirs\Docs\Excels\Report1.txt
```

- Add the following information to the *rsync_excludes_win.txt* file:

```
/MyDirs/Docs/Words/
/MyDirs/Docs/Excels/Report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

```
D:\MyDirs2\Docs2\Words2
D:\MyDirs2\Docs2\Excels\Report2.txt
```

  - Add the following information to the *rsync_excludes_win_disk1.txt* file:

```
/MyDirs2/Docs2/Words2/
/MyDirs2/Docs2/Excels2/Report2.txt
```

> **Note**
>
> To exclude a Windows directory, perform the following operations:
>
> - Remove the prefix of the directory (scr_path). In the preceding example, you must remove `D:`.
> - Replace `\` with `/`.

- Example 2: Exclude files or directories from migration of a Linux server
  - System disk (root directory/):
    - Specify the files or directories to be excluded:

```
/var/mydirs/docs/words
/var/mydirs/docs/excels/report1.txt
```

    - Add the following information to the *rsync_excludes_linux.txt* file:

```
/var/mydirs/docs/words/
/var/mydirs/docs/excels/report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

    ```
    /mnt/disk1/mydirs2/docs2/words2
    /mnt/disk1/mydirs2/docs2/excels2/report2.txt
    ```

  - Add the following information to the *rsync_excludes_linux_disk1.txt* file:

    ```
    /mydirs2/docs2/words2/
    /mydirs2/docs2/excels2/report2.txt
    ```

> **Note** To exclude a Linux directory, you must remove the prefix of the directory (scr_path). In the preceding example, you must remove */mnt/disk1*.

3. Run the SMC client to import the migration source information.
   i. Enter the SMC client folder and run the SMC client.
   - For Windows servers, use one of the following methods to run the SMC client:
     - To run the Windows GUI version, double-click the *go2aliyun_gui.exe* file.
     - To run the Windows CLI version, double-click the *go2aliyun_client.exe* file.

> **Note** When you run the program, you must click **OK** to confirm that you have the administrator privilege.

- For Linux servers, run the SMC client as a root or sudo user.
  - In the directory of the *go2aliyun_client* file, run the following commands as a root user:

    ```
    chmod +x go2aliyun_client
    ```

    ```
    ./go2aliyun_client
    ```

  - In the directory of the *go2aliyun_client* file, run the following commands as a sudo user:

    ```
    sudo chmod +x ./go2aliyun_client
    ```

    ```
    sudo ./go2aliyun_client
    ```

  If you have required permissions on the migration source system, you can also run the following commands to import the migration source information. In this case, you do not need to enter your AccessKey pair.

  - Run the following command as a root user:

    ```
    ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

  - Run the following command as a sudo user:

    ```
    sudo ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

ii. Enter the AccessKey pair of your Alibaba Cloud account.

> Note If the AccessKey pair you entered is invalid, open the *user_config.json* file, delete the access_id and secret_key values, and then run the client again.

- For Windows servers
  - If you use the Windows GUI version, enter the **AccessKey ID** in the **Access Id** field, enter the *AccessKey secret* in the *Secret Key* field, and then click **Start**. For more information, see Use the Windows GUI version of the SMC client.
  - If you use the Windows CLI version, enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.
- For Linux servers

  Enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.

  

  The following prompts may appear:
  - The rsync tool is installed in most mainstream migration sources. If rsync is not installed on the migration source, the SMC client displays a prompt. Enter *yes* to install rsync, as shown in the following figure.

    
  - If SELinux is enabled on the migration source, you are prompted to disable SELinux. Enter *yes* to disable SELinux, as shown in the following figure.

    

> Notice Do not close the client until the migration is complete. Otherwise, the migration source will be disconnected from the SMC console and the migration fails.

4. Log on to the SMC console.
5. Create a migration task.
   i. In the left-side navigation pane, click **Migration Sources**.
   ii. Find the migration source that you want to migrate.You can obtain the ID of the target migration source from the SMC client, as shown in the following figure. Then, you can use the ID to find the target migration source in the SMC console. For more information, see the "How do I find a migration source in the SMC console?" section in SMC FAQ.

   

   iii. Click **Create Migration Task** in the Actions column.
   iv. In the **Create Migration Task** pane, read migration instructions and configure migration task parameters.

   The **Basic configuration** section includes the following parameters:
   - **Target Region**: required. The ID of the destination region. For more information about Alibaba Cloud regions, seeRegions and zones.

- **Task name**: the name of the migration task.

  > **Note** The task name must be unique in the destination region.

- **Description**: the description of the migration task.
- **Target Disk Size (GiB)**: the disk configuration of the destination server.

  The following table describes the parameters.

Parameter	Required	Description
Enable Block Replication	No	■ Selected: Block replication ensures a stable data transmission rate during migration. This also ensures that the source and destination disks use the same partitioning scheme. You cannot modify the size of each partition in the destination disk. When you enable block replication, the **Whether to enable block replication** switch appears next to **Partition <N>**. ■ Cleared: SMC uses the default method to migrate the migration source. You can modify the size of each partition in the destination disk.

Parameter	Required	Description
System Disk	Yes	■ **System Disk**: the system disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 500. The size of the destination system disk must be greater than that of data in the source system disk. For example, if the total size of the source system disk is 500 GiB but the size of data stored in this disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. **Note** The default value of this parameter is the size of the source system disk. We recommend that you retain the default value or specify a greater value. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination system disk based on that of the source system disk. Unit: GiB. Valid values: 0 to 98. `N` indicates the serial number of the partition. For example, if the system disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level.

Parameter	Required	Description
Data Disk <N>	No	■ **Data Disk <N>**: the data disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 32768. ■ If you select the **Data Disk <N>** check box, a destination data disk is generated. ■ `N` indicates the serial number of the data disk. ■ The size of the destination data disk must be greater than that of existing data in the source data disk. For example, if the total size of the source data disk is 500 GiB but the size of data stored in the disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination data disk based on that of the source data disk. Unit: GiB. Valid values: 0 to 141. `N` indicates the serial number of the partition. For example, if a data disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level. Note **Data Disk <N>** is available only if the migration source has a data disk. For more information, see Why are no data disk parameters displayed in the Create Migration Task pane? How can I resolve this issue?

■ **Target Image Type**: the type of the destination image. Valid values:

- **ECS Image.** The following table describes the parameters.

Parameter	Required	Description
Image Name	No	Specifies the name of the destination ECS image generated by SMC for the migration source. Note The image name must be unique in the destination region.
Automatic incremental synchronization	No	Specifies whether SMC automatically synchronizes incremental data of the migration source to Alibaba Cloud. ■ To enable this feature, you must configure the following parameters: ■ **Synchronization Interval**: the interval at which SMC automatically synchronizes incremental data to Alibaba Cloud ■ **Maximum mirror retention**: the maximum number of images that can be retained during incremental migration SMC automatically synchronizes incremental data to Alibaba Cloud at the specified interval. For more information about best practices for incremental migration, see Migrate incremental data from a source server. ■ If you disable this feature, incremental data is not synchronized.

- **Container Image.** The following table describes the parameters.

Note SMC does not allow you to migrate Windows servers to Container Registry. For more information, see Migrate source servers to Container Registry.

Parameter	Required	Description
Namespace	Yes	The namespace of the destination container image
Repository Name	Yes	The name of the repository that stores the destination container image
Version	No	The version of the destination container image
RAM Role	Yes	The instance RAM role that is attached to the intermediate instance

- **Method to Run**: specifies whether to run a task immediately after it is created and whether to automatically run the task.
  - **Run Now**: The migration task runs immediately after it is created.
  - **Run Later**: The migration task automatically runs at the specified time after it is created.

    > **Note** The earliest time that you can specify to run a migration task is 10 minutes after its creation.

  - **Create Only**: After the task is created, you must manually start the task.

  Default value: **Run Now**.

Tag and Network (Optional):

- **Migration Task Tag**: the tags that you specify for the migration task. Each tag contains a key and a value. You can use tags to query and manage migration tasks.

  > **Note** You can specify a maximum of 20 tags for a migration task.

- **Network Type**: the type of the network that is used to migrate data to an intermediate instance. During migration, SMC creates an intermediate instance that connects to a VSwitch in a virtual private cloud (VPC). When you select Public Network, a public IP address is assigned to the intermediate instance.

  The following table describes the valid values.

Parameter value	Description

Parameter value	Description
Public Network	SMC migrates data to the intermediate instance over the Internet. If you select Public Network, make sure that the migration source can access the Internet. You can choose whether to specify a VPC and a VSwitch based on your requirements. ■ If you specify a VPC and a VSwitch, SMC creates an intermediate instance that connects to the specified VPC and VSwitch. When you migrate multiple migration sources at a time, you can specify the same VPC and VSwitch for migration tasks. This improves the usage of VPC resources. You can migrate a maximum of 100 migration sources at a time. ■ If you do not specify a VPC or a VSwitch, SMC automatically creates a VPC and a VSwitch and creates an intermediate instance that connects to the VPC and the VSwitch. If you do not specify a VPC or a VSwitch before you migrate multiple migration sources at a time, SMC creates a VPC for each intermediate instance. Note Each Alibaba Cloud account can have a maximum of 10 VPCs in a region, including the VPCs that you create and the VPCs that are automatically created by SMC. Therefore, you can migrate a maximum of 10 migration sources at a time. To increase the VPC quota, submit a ticket.
VPC	SMC migrates data to the intermediate instance through a VPC. If you select VPC, you must specify a VPC and a VSwitch and make sure that the migration source can connect to the VPC. Note If your server in the on-premises data center, virtual machine, or cloud host can connect to a VPC, we recommend that you select this mode to migrate data. Compared with data migration over the Internet, VPC-based data migration is more efficient and stable. You can use VPN Gateway, Express Connect, and Smart Access Gateway to connect a migration source to a VPC. For more information, see Connect an on-premises data center to a VPC network.

Advanced Settings (Optional):

- **Transmission speed limit (KB/S)**: the maximum bandwidth for data transmission during migration. Unit: Kbit/s.

  The default value is 0, which indicates that the bandwidth is not limited.

- **Compression Level**: the compression ratio of data to be migrated. Set the compression ratio based on your requirements.
  - If the bandwidth is limited, a high compression ratio improves the transmission efficiency.
  - If a high bandwidth is available, we recommend that you do not compress data. Data compression consumes CPU resources of the migration source.

  The default value is 0, which indicates that data to be migrated is not compressed.
- **Checksum**: This feature enhances the verification of data consistency between the migration source and the destination server, but may compromise the data transmission rate.

  By default, this feature is disabled.

v. After the configuration is complete, click **OK**.

6. Start the migration task.

> **Note** If you set the Method to Run parameter to **Run Now**, skip this step. If you set the Method to Run parameter to **Create Only** or **Run Later**, you can perform the following steps to start the migration task.

i. In the left-side navigation pane, click **Migration Tasks**.

ii. Find the target migration task and click **Start** in the Actions column.

- To start multiple migration tasks at a time, select the target tasks and click **Start/Retry** in the lower part of the Migration Tasks page. The status of the selected tasks must be **Ready**, **Stopped**, or **Error**.
- To suspend a migration task in the **Syncing** state, click **Pause** in the **Actions** column.

After the migration is complete, perform the following operations based on the destination image type:

- ECS image: Create Elastic Compute Service (ECS) instances by using the custom image. For more information, see Create an ECS instance by using a custom image.
- Container image: Deploy applications by using the container image. For more information, see Migrate source servers to Container Registry.

FAQ

Why am I unable to start or stop Linux instances in the Elastic Compute Service console?

You may be unable to start or stop Linux instances in the ECS console because some Linux kernels are customized by UCloud and may be incompatible with Alibaba Cloud. If your server runs the CentOS operating system, you can change the Linux kernels. For more information, visit Active Versions of CentOS Linux. For technical support, see Contact us.

8.10. Migrate data between Alibaba Cloud VMs

This topic describes how to migrate data between Alibaba Cloud virtual machines (VMs)

Context

If you want to migrate data between Alibaba Cloud VMs, we recommend that you use the Copy Image and Share Image features. For more information, see Copy custom images and Share or unshare custom images. If these two features cannot meet your business needs, you can use the methods that are described in the following scenarios:

- Migrate data between Alibaba Cloud VMs within the same virtual private cloud (VPC)
- Migrate data between Windows-based Alibaba Cloud VMs across VPCs
- Migrate data between Windows-based Alibaba Cloud VMs across VPCs

After the preparations are complete, you can start the migration. For more information, see Migrate data between Alibaba Cloud VMs. If you migrate a VM for the first time, we recommend that you perform a test migration.

Migrate data between Alibaba Cloud VMs within the same virtual private cloud (VPC)

You can use this migration method to decrease the disk size of an Elastic Compute Service (ECS) instance. For more information, see Decrease the size of a disk.

We recommend that you select VPC as the network type when you create a migration task. Compared with migration over the Internet, migration over the VPC is more efficient and stable.

Migrate data between Windows-based Alibaba Cloud VMs across VPCs

You can use this migration method to migrate data between Windows-based Alibaba Cloud VMs across accounts, regions, or VPCs.

Before the migration, perform the following operations:

- Create snapshots to back up data.
- Check the validity of your application licenses.

  After you migrate data between Alibaba Cloud VMs across VPCs, the application licenses that are associated with the underlying hardware may become invalid.
- Check the network environment.
  - If you perform migration across regions outside mainland China, the network may become unstable.
  - If a VPC network is available, we recommend that you perform migration over the VPC network. Compared with migration over the Internet, migration over the VPC is more efficient and stable.
- Make sure that the Volume Shadow Copy Service (VSS) is enabled.
- Check whether the QEMU Guest Agent is installed. If the QEMU Guest Agent is installed, you must uninstall it. For information about how to uninstall the QEMU Guest Agent, see SMC FAQ.

Migrate data between Windows-based Alibaba Cloud VMs across VPCs

You can use this migration method to migrate data between Linux-based Alibaba Cloud VMs across accounts, regions, or VPCs.

Before the migration, perform the following operations:

- Create snapshots to back up data.

- Check the validity of your application licenses.

  After you migrate data between Alibaba Cloud VMs across VPCs, the application licenses that are associated with the underlying hardware may become invalid.

- Check the network environment.
  - If you perform migration across regions outside mainland China, the network may become unstable.
  - If a VPC network is available, we recommend that you perform migration over the VPC network. Compared with migration over the Internet, migration over the VPC is more efficient and stable.

Migrate data between Alibaba Cloud VMs

For more information, see Before you begin.

1. Download and decompress the SMC client package.
   i. Download the SMC client package.If the migration source has access to the Internet, you can also download the SMC client package to the migration source.

   > Note You can log on to the SMC console. In the upper-right corner of the page, click Download Latest SMC Client to download the latest version of the SMC client.

   ii. Upload the SMC client package to the migration source.
   - You can build an FTP site to upload files. For more information, see Manually build an FTP site on a Windows instance or Manually build an FTP site on a CentOS 7 instance.
   - You can also use a remote connection tool that supports file transfer. This allows you to upload the SMC client package to the migration source.

   iii. Decompress the SMC client package.The SMC client is available for Windows and Linux of the 32-bit version (i386) and the 64-bit version (x86_64). Select the version that is compatible with the migration source. The following figure shows the decompressed client folders for Windows.

   > Note Linux systems run the unzip <name of the SMC client package> command. This allows you to decompress the SMC client package. Make sure that the unzip utility is installed on the source server. For example, the installation command for CentOS 7 is yum -y install unzip.

iv. Decompress the client package that is compatible with the operating system of your source server.The following figure shows the directories and files in the decompressed folder.

SMC client folders and files

Folder or file	Description
go2aliyun_client.exe	The executable file of the command-line interface (CLI) program for Windows.
go2aliyun_gui.exe	The executable file of the graphical user interface (GUI) program for Windows. For more information, see Use the Windows GUI version of an SMC client.
go2aliyun_client	The executable file of the CLI program for Linux.
user_config.json	The configuration file of the migration source and destination.
Excludes	The folder of the files and directories that are excluded from migration.
client_data	The migration data file. This includes the intermediate instance information and migration progress.

2. Optional. Exclude files or directories from migration.

> **Note** If the source server supports block replication, you cannot exclude files or directories from migration.

The configuration files are located in the *Excludes* directory of the SMC client. If a configuration file is lost or deleted by accident, you can create another one.

- System disk configuration file: *rsync_excludes_win.txt* (for Windows servers) or *rsync_excludes_linux.txt* (for Linux servers)
- Data disk configuration file: named by adding a suffix *disk [disk index number]* to the system disk, for example, *rsync_excludes_win_disk1.txt* (for Windows servers) or *rsync_excludes_linux_disk1.txt* (for Linux servers)
- Example 1: Exclude files or directories from migration of a Windows server
  - System disk
    - Specify the files or directories to be excluded:

```
C:\MyDirs\Docs\Words
C:\MyDirs\Docs\Excels\Report1.txt
```

- Add the following information to the *rsync_excludes_win.txt* file:

```
/MyDirs/Docs/Words/
/MyDirs/Docs/Excels/Report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

```
D:\MyDirs2\Docs2\Words2
D:\MyDirs2\Docs2\Excels\Report2.txt
```

  - Add the following information to the *rsync_excludes_win_disk1.txt* file:

```
/MyDirs2/Docs2/Words2/
/MyDirs2/Docs2/Excels2/Report2.txt
```

> **Note**
>
> To exclude a Windows directory, perform the following operations:
>
> - Remove the prefix of the directory (scr_path). In the preceding example, you must remove `D:`.
> - Replace `\` with `/`.

- Example 2: Exclude files or directories from migration of a Linux server
  - System disk (root directory/):
    - Specify the files or directories to be excluded:

```
/var/mydirs/docs/words
/var/mydirs/docs/excels/report1.txt
```

    - Add the following information to the *rsync_excludes_linux.txt* file:

```
/var/mydirs/docs/words/
/var/mydirs/docs/excels/report1.txt
```

- Data disk
  - Specify the files or directories to be excluded:

    ```
    /mnt/disk1/mydirs2/docs2/words2
    /mnt/disk1/mydirs2/docs2/excels2/report2.txt
    ```

  - Add the following information to the *rsync_excludes_linux_disk1.txt* file:

    ```
    /mydirs2/docs2/words2/
    /mydirs2/docs2/excels2/report2.txt
    ```

> **Note** To exclude a Linux directory, you must remove the prefix of the directory (scr_path). In the preceding example, you must remove */mnt/disk1*.

3. Run the SMC client to import the migration source information.
   i. Enter the SMC client folder and run the SMC client.
   - For Windows servers, use one of the following methods to run the SMC client:
     - To run the Windows GUI version, double-click the *go2aliyun_gui.exe* file.
     - To run the Windows CLI version, double-click the *go2aliyun_client.exe* file.

> **Note** When you run the program, you must click **OK** to confirm that you have the administrator privilege.

- For Linux servers, run the SMC client as a root or sudo user.
  - In the directory of the *go2aliyun_client* file, run the following commands as a root user:

    ```
    chmod +x go2aliyun_client
    ```

    ```
    ./go2aliyun_client
    ```

  - In the directory of the *go2aliyun_client* file, run the following commands as a sudo user:

    ```
    sudo chmod +x ./go2aliyun_client
    ```

    ```
    sudo ./go2aliyun_client
    ```

  If you have required permissions on the migration source system, you can also run the following commands to import the migration source information. In this case, you do not need to enter your AccessKey pair.

  - Run the following command as a root user:

    ```
    ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

  - Run the following command as a sudo user:

    ```
    sudo ./go2aliyun_client --accessid=<Your AccessKeyID> --secretkey=<Your AccessKeySecret>
    ```

ii. Enter the AccessKey pair of your Alibaba Cloud account.

> Note If the AccessKey pair you entered is invalid, open the *user_config.json* file, delete the access_id and secret_key values, and then run the client again.

- For Windows servers
  - If you use the Windows GUI version, enter the **AccessKey ID** in the **Access Id** field, enter the *AccessKey secret* in the *Secret Key* field, and then click **Start**. For more information, see Use the Windows GUI version of the SMC client.
  - If you use the Windows CLI version, enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.
- For Linux servers

  Enter the *AccessKey ID* and *AccessKey secret*, and then press `Enter`.

  

  The following prompts may appear:
  - The rsync tool is installed in most mainstream migration sources. If rsync is not installed on the migration source, the SMC client displays a prompt. Enter *yes* to install rsync, as shown in the following figure.

    
  - If SELinux is enabled on the migration source, you are prompted to disable SELinux. Enter *yes* to disable SELinux, as shown in the following figure.

    

> Notice Do not close the client until the migration is complete. Otherwise, the migration source will be disconnected from the SMC console and the migration fails.

4. Log on to the SMC console.
5. Create a migration task.
   i. In the left-side navigation pane, click **Migration Sources**.
   ii. Find the migration source that you want to migrate.You can obtain the ID of the target migration source from the SMC client, as shown in the following figure. Then, you can use the ID to find the target migration source in the SMC console. For more information, see the "How do I find a migration source in the SMC console?" section in SMC FAQ.

   

   iii. Click **Create Migration Task** in the Actions column.
   iv. In the **Create Migration Task** pane, read migration instructions and configure migration task parameters.

   The **Basic configuration** section includes the following parameters:
   - **Target Region**: required. The ID of the destination region. For more information about Alibaba Cloud regions, seeRegions and zones.

- **Task name**: the name of the migration task.

  > **Note** The task name must be unique in the destination region.

- **Description**: the description of the migration task.
- **Target Disk Size (GiB)**: the disk configuration of the destination server.

  The following table describes the parameters.

Parameter	Required	Description
Enable Block Replication	No	■ Selected: Block replication ensures a stable data transmission rate during migration. This also ensures that the source and destination disks use the same partitioning scheme. You cannot modify the size of each partition in the destination disk. When you enable block replication, the **Whether to enable block replication** switch appears next to **Partition <N>**. ■ Cleared: SMC uses the default method to migrate the migration source. You can modify the size of each partition in the destination disk.

Parameter	Required	Description
System Disk	Yes	■ **System Disk**: the system disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 500. The size of the destination system disk must be greater than that of data in the source system disk. For example, if the total size of the source system disk is 500 GiB but the size of data stored in this disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. **Note** The default value of this parameter is the size of the source system disk. We recommend that you retain the default value or specify a greater value. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination system disk based on that of the source system disk. Unit: GiB. Valid values: 0 to 98. `N` indicates the serial number of the partition. For example, if the system disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level.

Parameter	Required	Description
Data Disk <N>	No	■ **Data Disk <N>**: the data disk size of the destination ECS instance. Unit: GiB. Valid values: 20 to 32768. ■ If you select the **Data Disk <N>** check box, a destination data disk is generated. ■ `N` indicates the serial number of the data disk. ■ The size of the destination data disk must be greater than that of existing data in the source data disk. For example, if the total size of the source data disk is 500 GiB but the size of data stored in the disk is only 100 GiB, you must set this parameter to a value greater than 100 GiB. ■ **Partition <N>**: SMC generates a partitioning scheme for the destination data disk based on that of the source data disk. Unit: GiB. Valid values: 0 to 141. `N` indicates the serial number of the partition. For example, if a data disk of the migration source has only one partition, **Partition 0** is generated. ■ **Whether to enable block replication**: This switch is available only when you select **Enable Block Replication**. SMC allows or disallows you to turn on the switch based on whether the migration source supports block replication. ■ If the migration source does not support block replication for partitions, you are disallowed to turn on this switch. ■ If the migration source supports block replication for partitions, you are allowed to turn on this switch to migrate disk data at the partition level. Note **Data Disk <N>** is available only if the migration source has a data disk. For more information, see Why are no data disk parameters displayed in the Create Migration Task pane? How can I resolve this issue?

■ **Target Image Type**: the type of the destination image. Valid values:

- **ECS Image.** The following table describes the parameters.

Parameter	Required	Description
Image Name	No	Specifies the name of the destination ECS image generated by SMC for the migration source. Note The image name must be unique in the destination region.
Automatic incremental synchronization	No	Specifies whether SMC automatically synchronizes incremental data of the migration source to Alibaba Cloud. ■ To enable this feature, you must configure the following parameters: ■ **Synchronization Interval**: the interval at which SMC automatically synchronizes incremental data to Alibaba Cloud ■ **Maximum mirror retention**: the maximum number of images that can be retained during incremental migration SMC automatically synchronizes incremental data to Alibaba Cloud at the specified interval. For more information about best practices for incremental migration, see Migrate incremental data from a source server. ■ If you disable this feature, incremental data is not synchronized.

- **Container Image.** The following table describes the parameters.

Note SMC does not allow you to migrate Windows servers to Container Registry. For more information, see Migrate source servers to Container Registry.

Parameter	Required	Description
Namespace	Yes	The namespace of the destination container image
Repository Name	Yes	The name of the repository that stores the destination container image
Version	No	The version of the destination container image
RAM Role	Yes	The instance RAM role that is attached to the intermediate instance

- **Method to Run**: specifies whether to run a task immediately after it is created and whether to automatically run the task.
  - **Run Now**: The migration task runs immediately after it is created.
  - **Run Later**: The migration task automatically runs at the specified time after it is created.

    > **Note** The earliest time that you can specify to run a migration task is 10 minutes after its creation.

  - **Create Only**: After the task is created, you must manually start the task.

  Default value: **Run Now**.

Tag and Network (Optional):

- **Migration Task Tag**: the tags that you specify for the migration task. Each tag contains a key and a value. You can use tags to query and manage migration tasks.

  > **Note** You can specify a maximum of 20 tags for a migration task.

- **Network Type**: the type of the network that is used to migrate data to an intermediate instance. During migration, SMC creates an intermediate instance that connects to a VSwitch in a virtual private cloud (VPC). When you select Public Network, a public IP address is assigned to the intermediate instance.

  The following table describes the valid values.

Parameter value	Description

Parameter value	Description
Public Network	SMC migrates data to the intermediate instance over the Internet. If you select Public Network, make sure that the migration source can access the Internet. You can choose whether to specify a VPC and a VSwitch based on your requirements. ■ If you specify a VPC and a VSwitch, SMC creates an intermediate instance that connects to the specified VPC and VSwitch. When you migrate multiple migration sources at a time, you can specify the same VPC and VSwitch for migration tasks. This improves the usage of VPC resources. You can migrate a maximum of 100 migration sources at a time. ■ If you do not specify a VPC or a VSwitch, SMC automatically creates a VPC and a VSwitch and creates an intermediate instance that connects to the VPC and the VSwitch. If you do not specify a VPC or a VSwitch before you migrate multiple migration sources at a time, SMC creates a VPC for each intermediate instance. Note Each Alibaba Cloud account can have a maximum of 10 VPCs in a region, including the VPCs that you create and the VPCs that are automatically created by SMC. Therefore, you can migrate a maximum of 10 migration sources at a time. To increase the VPC quota, submit a ticket.
VPC	SMC migrates data to the intermediate instance through a VPC. If you select VPC, you must specify a VPC and a VSwitch and make sure that the migration source can connect to the VPC. Note If your server in the on-premises data center, virtual machine, or cloud host can connect to a VPC, we recommend that you select this mode to migrate data. Compared with data migration over the Internet, VPC-based data migration is more efficient and stable. You can use VPN Gateway, Express Connect, and Smart Access Gateway to connect a migration source to a VPC. For more information, see Connect an on-premises data center to a VPC network.

Advanced Settings (Optional):

- **Transmission speed limit (KB/S)**: the maximum bandwidth for data transmission during migration. Unit: Kbit/s.

  The default value is 0, which indicates that the bandwidth is not limited.

- **Compression Level**: the compression ratio of data to be migrated. Set the compression ratio based on your requirements.
  - If the bandwidth is limited, a high compression ratio improves the transmission efficiency.
  - If a high bandwidth is available, we recommend that you do not compress data. Data compression consumes CPU resources of the migration source.

  The default value is 0, which indicates that data to be migrated is not compressed.
- **Checksum**: This feature enhances the verification of data consistency between the migration source and the destination server, but may compromise the data transmission rate.

  By default, this feature is disabled.

v. After the configuration is complete, click **OK**.

6. Start the migration task.

> **Note** If you set the Method to Run parameter to **Run Now**, skip this step. If you set the Method to Run parameter to **Create Only** or **Run Later**, you can perform the following steps to start the migration task.

i. In the left-side navigation pane, click **Migration Tasks**.

ii. Find the target migration task and click **Start** in the Actions column.
   - To start multiple migration tasks at a time, select the target tasks and click **Start/Retry** in the lower part of the Migration Tasks page. The status of the selected tasks must be **Ready**, **Stopped**, or **Error**.
   - To suspend a migration task in the **Syncing** state, click **Pause** in the **Actions** column.

What's next

After the migration is complete, perform the following operations based on the destination image type:

- ECS image: Create ECS instances by using a custom image. For more information, see Create an ECS instance by using a custom image.
- Container image: Deploy applications by using the container image. For more information, see Migrate source servers to Container Registry.