

# Alibaba Cloud Lightning Cube

**Migrate data between NAS file systems**

Issue: 20190603

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# Generic conventions

Table -1: Style conventions

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

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



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# 1 Background information

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This topic describes how to migrate data between Network Attached Storage (NAS) file systems.

Alibaba Cloud Data Transport is used as a data channel between various data stores. With Data Transport, you can migrate data between NAS file systems.

With Data Transport, you only need to log on to the console, specify a data source address and a destination OSS endpoint, and then create a migration job. After starting a migration job, you can perform management tasks for the job such as viewing the progress and status of the job. Additionally, you can view the list of successful migration files and the list of failed migration files.

This guide includes the following topics:

- [Prerequisites](#)
- [Create a migration job](#)
- [Manage migration jobs](#)

## 2 Prerequisites

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When you migrate data between NAS data addresses, Data Transport must be allowed to access both the source NAS data address and the destination NAS data address. You must ensure that Data Transport can access two NAS data addresses using a VPC.

### Two NAS data addresses that are not located in a VPC

If NAS data addresses are not located in VPCs, you must attach both the source NAS data address and destination NAS data address to the same VPC. This enables access to both data addresses.

- Alibaba Cloud
  - You must mount both the source NAS file system and the destination NAS file system on the same mount point. For more information, see [Add a mount point](#).
  - If you set access permissions for NAS file systems, you must enable access to these NAS file systems from all IP addresses in the same VPC where the NAS files systems are located. For more information, see [Manage access permissions of a file system](#).
- Others
  - You can use one of the following methods to attach both the source NAS file system and destination NAS file system to the same VPC:
    - Enable access to a NAS file system from a VPC by connecting to the VPC by using a dedicated data circuit. For more information, contact Alibaba Cloud technical support.
    - Enable access to a NAS file system by using a VPN network to connect to a VPC.
  - If you set access permissions for NAS file systems, you must enable access to these NAS file systems from all IP addresses in the same VPC where the NAS files systems are located.

### Two NAS data addresses that are located in the same VPC

If both the source NAS file system and the destination NAS file system are located in the same VPC, the connection between the file systems is enabled by default. If you set access permissions for NAS file systems, you must enable access to these NAS

file systems from all IP addresses in the same VPC where the NAS files systems are located.

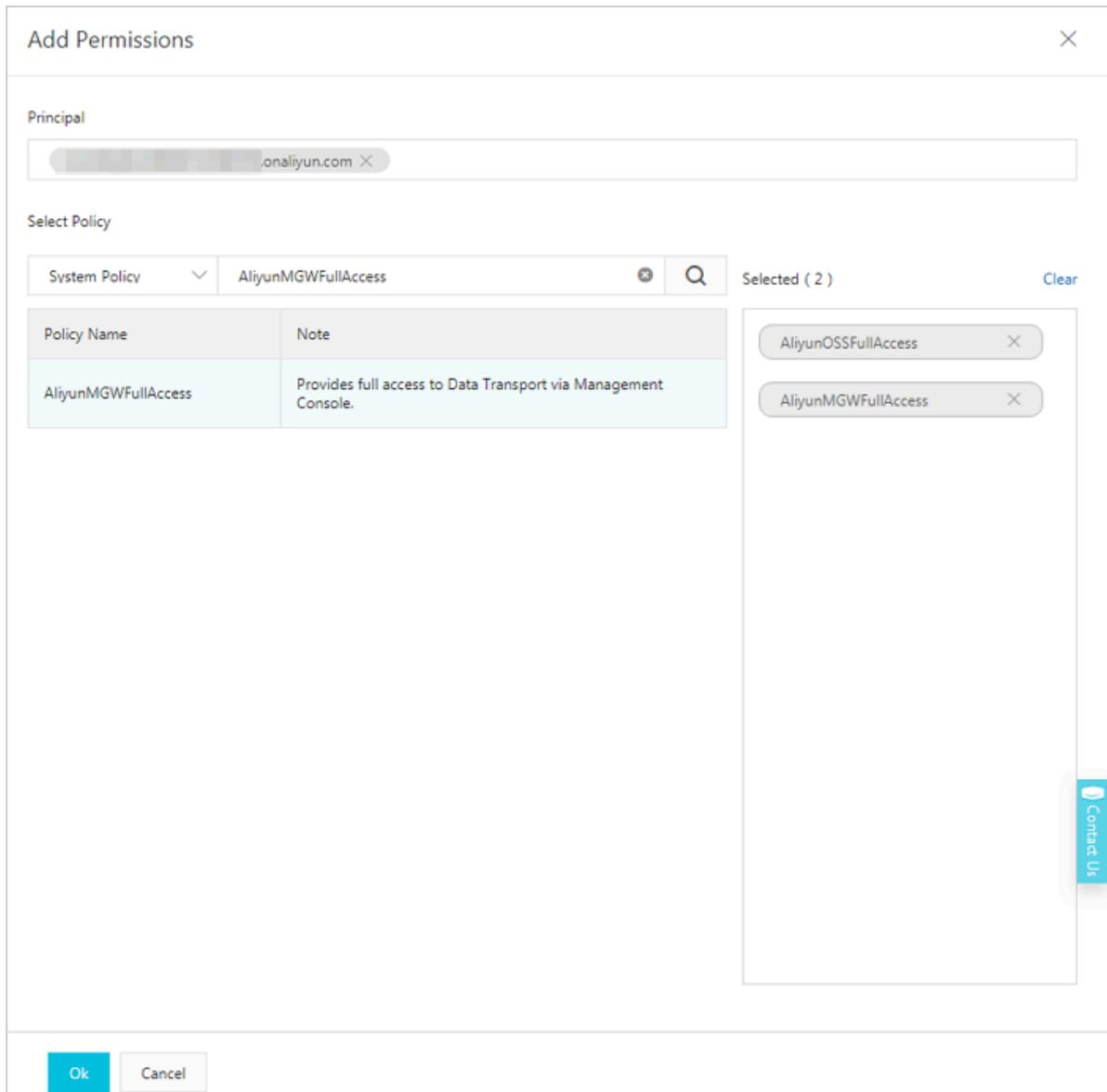
#### Two NAS data addresses that are located in different VPC networks

- If NAS file systems are located in different VPC networks, you must connect the VPC networks by using Cloud Enterprise Network (CEN)
  - When the source NAS file system and destination NAS file system are located in the same account, same region but different VPC networks, see [Connect VPC networks in the same account and same region](#).
  - You must connect the file systems by using CEN. This occurs if the source NAS file system and the destination NAS file system are owned by the same account but located in different VPCs of separate regions. For more information, see [Connect VPC networks that are owned by the same account but located in multiple regions](#).
  - When the source NAS file system and destination NAS file system are owned by different accounts and located in different VPC of the same region, see [Connect VPC networks that are located in the same region but owned by multiple accounts](#).
  - When the source NAS file system and destination NAS file system are owned by different accounts and located in different VPC of the same region, see [Connect VPC networks that are owned by multiple accounts and located in multiple regions](#).
- If you want to set the access permissions for NAS file systems, you must perform the following steps. You must enable access to the source NAS file system and the destination NAS file system from all IP addresses in respective VPCs where the NAS files systems are located.

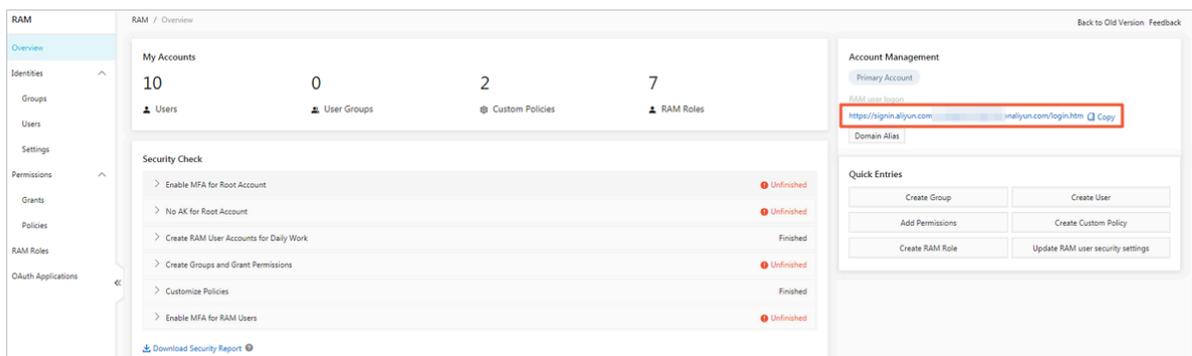
#### Create and authorize a RAM user

1. Log on to the [RAM console](#).
2. Choose Identities > Users > Create User.
3. Select Console Password Logon and Programmatic Access and then enter the required User Account Information.
4. Click OK to save the generated account, password, AccessKeyID, and AccessKeySecret.
5. Select the required user account, click Add Permissions to grant the read/write permission (AliyunOSSFullAccess) and migration permission

(AliyunMGWFullAccess) for the RAM user. The Add Permissions dialog is shown in the following figure.



6. In the left-side navigation pane, select Overview, click the link in the RAM user logon section, and enter the username and password of the newly created RAM user to log on to the console.



## 3 Create a migration job

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This topic describes the operations and considerations for data migration.

### Precautions

When creating a migration job, you need to note the following issues:

- A migration job occupies the network resources of the source data address and the destination data address. To ensure business continuity, we recommend that you specify a speed limit for a migration job or perform the migration job during off-peak hours.
- Before a migration job is performed, files at both the source data address and the destination data address are checked. The files at the destination data address are overwritten during a migration job. This occurs if the source files have the same name as the destination files, but have a later update time. If two files have the same name but different content, you must change the name of one file or back up the files.
- Symbolic link files that exist at the source data address are disregarded during migration.

### Step 1: Create a source data address

1. Log on to the [Data Transport console](#).
2. Choose Data Online Migration > Data Address, and then click Create Data Address.
3. In the Create Data Address dialog box, set the required options and click OK. The options are described as follows:

Option	Required	Description
Data Type	Yes	Select NAS.

Option	Required	Description
Data Region	Yes	Select the region where the NAS file system is located.  If you select Alibaba Cloud for the NAS Type, select the region where the NAS file system is located. If you select Others for the NAS Type, select the region that hosts the VPC where a third-party NAS file system is located.
Data Name	Yes	The data name can be 3 to 63 characters in length. Special characters are not supported, except for hyphens (-) and underscores (_).
NAS Type	Yes	Select the required source of a NAS file system.  <ul style="list-style-type: none"> <li>Alibaba Cloud: a file system that is created in NAS.</li> <li>Others: a file system that is created in a third-party NAS service. You must mount the file system on an ECS instance that is located in a VPC.</li> </ul>
File System	Yes (only for Alibaba Cloud)	Select the required NAS file system.
Mount Point	Yes (only for Alibaba Cloud)	Select the required NAS mount point.   <b>Notice:</b> You can only mount a NAS file system on an ECS instance that is located in a VPC network (classic network not supported).
VPC	Yes (only for Others)	Select a VPC network where the third-party NAS file system is located.
Switches	Yes (only for Others)	Select a VSwitch that is owned by the VPC network.
NAS Address	Yes (only for Others)	Enter the private IP address of the third-party NAS instance that is located in the VPC network.

Option	Required	Description
Sub Folder	Optional	<p>Enter the directory to be migrated. If you leave this field blank, all data in the root directory (/) is migrated.</p> <div style="background-color: #f0f0f0; padding: 5px;">  <b>Notice:</b>                      If you enter the Sub Folder, ensure that the directory exists in the NAS instance. Otherwise, the data address fails to be created.                 </div>
Connection Method	Yes (only for Others)	Select a protocol type for NAS.
Connection Password	Yes (only for Others)	<p>Select whether a password is required.</p> <ul style="list-style-type: none"> <li>· No password: If no password is required to access the NAS service, select no password.</li> <li>· Use Password: Enter the required username and password. You must use the username and password to access the shared folder.</li> </ul>

 **Note:**  
 For more information about the status of a new data address, see [Data address status](#).

4. You must apply for whitelist permissions because this feature is still in the beta testing phase. Click Application.
5. Enter the required information and submit the beta testing application for migration. After the application has been approved, you will receive an SMS notification.

**Step 2: Create a destination data address**

- If the source NAS data address and the destination NAS data address are located in the same VPC, see [Step 1: Create a source data address](#).

- If the source NAS data address and the destination NAS data address are located in two different VPCs, you must follow these steps to create a destination data address:
  - Data Type: Select NAS.
  - Data Region: Select the same region as that of the source NAS data address.
  - NAS Type: Select Others.
  - VPC: Select the same VPC as that of the source NAS data address.
  - Switches: Select the same VSwitch as that of the source NAS data address.
  - NAS Address: If the type of the destination NAS data address is Alibaba Cloud, enter the mount point of the data address. If the type of the destination NAS data address is Others, enter the private IP address of the data address that is located in a VPC.
  - For the remaining options, conform to the rules that are used to create a source data address.

### Step 3: Create a migration job

1. Select Data Online Migration > Migration Jobs and click Create Job.
2. In the Create Job dialog box, read the Terms of Data Transport, select I understand the above terms and conditions, activate Data Transport, and then click Next.
3. In the Create Job dialog box, set the required options and click Next.

The options are described as follows:

Option	Required	Description
Job Name	Yes	The job name can be 3 to 63 characters in length and can contain lowercase letters, numbers, and hyphens (-). A job name cannot start or end with a hyphen (-).
Source Data Address	Yes	Select the created source data address.

Option	Required	Description
Destination Data Address	Yes	<p>Select the created destination data address.</p> <p> <b>Notice:</b> You can <a href="#">open a ticket</a> to apply for the permission of creating a cross-country migration job. This occurs if the country where the source data address is located is different from the country where the destination data address is located. You must ensure that your business is legitimate, data does not include illegal information, and data transit conforms to local rules and regulations.</p>

Option	Required	Description
Migration Type	Yes	<p>Before you start a migration job, Data Transport compares files of the source data address with those of the destination data address. The files at the source data address and destination data address, which have the same name, ContentType, size, and latest update time are disregarded during migration. However, the other files are migrated.</p> <ul style="list-style-type: none"> <li>• <b>Full:</b> You can specify the Start Time Point of File. Files whose last modified time is later than the specified start time are migrated. After all of the files are migrated, a migration job is closed. When you repeat a full migration job, Data Transport only migrates files that have been changed.</li> <li>• <b>Incremental:</b> You must specify the Migration Interval and Migration Times to perform an incremental migration job. You must specify the Start Point Time of File. Files whose last modified time is later than the specified start time are migrated for the first time. After the first migration job is complete, an incremental migration job is performed based on the Migration Interval. A migration interval involves sending files that are created or modified within a specific range from the source data address to the destination data address. The specified range is the time when the last migration job started and before the time when this migration starts. Assume that you specify N for the Migration Times. A full migration is performed once. In the future, an incremental migration will be performed (N - 1) times.</li> </ul>
10		<p>For example, you set the Migration Interval to 1 and Migration Times to 5. Additionally, you set the Start Time Point of File to 2019/03/05 08:00:00</p>

Option	Required	Description
Start Time Point of File	Yes (only for Full and Incremental)	<ul style="list-style-type: none"> <li>• All: All files are migrated.</li> <li>• Assign: Files that are created or modified after the specified time are migrated. For example, when you set the Start Time Point of File to 2018 /11/01 08:00:00, only files that are created or modified after 2018/11/01 08:00:00 are migrated. The files that are created or modified before the specified time will be disregarded.</li> </ul>
Migration Interval	Yes (only for Incremental migration)	The default value is 1 Hour and the maximum value is 24 Hours.
Migration Times	Yes (only for Incremental migration)	The default value is 1 time and the maximum value is 30 times.
Start Time Point of File	Yes (only for Sync)	<ul style="list-style-type: none"> <li>• All: All files are synchronized.</li> <li>• Assign: Files that are created or modified after the specified time are synchronized. For example, when you set the Start Time Point of File to 2018/11/01 08:00:00, only files that are created or modified after 2018 /11/01 08:00:00 are synchronized. The files that are created or modified before the specified time will be disregarded.</li> </ul>
Start Time of Job	Yes (only for Sync)	<ul style="list-style-type: none"> <li>• Immediately: A synchronization immediately runs after a migration job is complete.</li> <li>• Schedule: You can set the scheduled time and synchronize data at the specified time.</li> </ul>
Job Period	Yes (only for Sync)	The time interval between two synchronizations. A synchronization runs whenever a job period ends. Valid units: hour, day, and week.

Option	Required	Description
The next synchronization runs until the last synchronization ends.	Yes (only for Sync)	Don't trigger a new task if another task is running. Assume that you set the Job Period to 1 Hour and you forgot to select this option. The next synchronization runs regardless of whether the last synchronization is completed within one hour. This option is selected by default.

4. Click Next to enter the Performance tab.

- When you select Full or Incremental, enter the Data Size and the File Count.



**Note:**

To ensure a successful migration, you must accurately estimate the amount of data to be migrated. For more information, see [Estimate the amount of data to be migrated](#).

- When you select Sync, enter the Subtask File Count and Subtask File Size.
  - **Subtask File Count:** You can separate a migration job into multiple subtasks based on the number of files that you specify. You can run a maximum of 20 subtasks at a time. Set the appropriate number of files for each subtask to reduce the time of a migration job. The default value is 1000. Assume that you need to migrate 10,000 files. When you set the Subtask File Count to 500, the migration job is separated into 20 subtasks that run at the same time. When you set the Subtask File Count to 100, the migration job is separated into 100 subtasks. Each time 20 subtasks run and the remaining subtasks are queued.
  - **Subtask File Size:** You can separate a migration job into multiple subtasks based on the number of files that you specify. You can run a maximum of 20 subtasks at a time. Set the appropriate size of files for each subtask to reduce the time of a migration job. The default value is 1 GB. Assume that you need to migrate files with a total size of 40 GB. When you set the Subtask File Size to 2 GB, the migration job is separated into 20 subtasks that run at the same time. When you set the Subtask File Size to 1 GB, the migration job is separated into 40 subtasks. Each time 20 subtasks run and the remaining subtasks are queued.



**Note:**

A subtask is generated when either the specified Subtask File Count or Subtask File Size is met. When the number of files reaches the specified Subtask File Count but the file size does not reach the specified Subtask File Size, a subtask is generated based on the number of files. When the file size reaches the specified Subtask File Size but the number of files does not reach the specified Subtask File Count, a subtask is generated based on the file size. Assume that you set the Subtask File Count to 1000 and Subtask File Size to 1 GB. When the number of files reaches 1,000 but the file size does not reach 1 GB, a subtask is generated based on the number of files. When the file size reaches 1 GB but the number of files does not reach 1,000, a subtask is generated based on the file size.

5. This step is optional. On the Performance tab, navigate to the Flow Control section, set the Time Range and Max Flow, and then click Add.



Note:

To ensure business continuity, we recommend that you set the Time Range and Max Flow based on the fluctuation of visits. The default value of the Time Range is 06 : 00 - 12 : 00 . The default value of the Max Flow is 5 MB / s .

6. Click Create. Wait until a migration job is complete.

#### View the status of a data address

After you create the data address of an ECS instance, only one status for the data address of an ECS instance is displayed. The status can be one of the following:

- **Normal:** indicates that a data address is created.
- **Creating:** requires about three minutes to create the first NAS data address. This process takes a while. If the status of a data address is in the Creating state for a long time, you can click Refresh in the upper-right corner to update the status.
- **Invalid:** an error occurred while creating a data address. You can verify that the configuration is correct and Data Transport is allowed to access the shared files of an ECS instance. If this issue persists, you can contact [Alibaba Cloud technical support](#).

## 4 Manage migration jobs

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This topic describes several subsequent operations after you create a migration job.

Subsequent operations change based on the migration type. You can manage different types of migration jobs as follows.

### Manage full migration and incremental migration jobs

- View the status of a migration job

After you create a migration job, only one migration job status is displayed. The status can be one of the following:

- **Migrating:** indicates that data is being migrated. This process takes a while.
- **Create Failed:** indicates that you failed to create a migration job. You can view the cause of the failure and recreate a migration job.
- **Completed:** indicates that a migration job is complete. You can view a migration report.
- **Failed:** indicates that a migration job failed. You can view the migration report and migrate failed files.

- Modify flow control settings

During a migration job, you can modify flow control settings at any time based on your needs.

1. In the [Data Transport console](#), choose Data Online Migration > Migration Jobs. On the Migration Jobs page, locate a migration job and click Manage next to the job.
2. Click Stop and ensure that the job is stopped.
3. On the Flow Control Time Schedule chart, click Reset.
  - To add a flow control setting, select the appropriate Time Range and Max Flow, and click Add.
  - To delete a flow control setting, click  next to the flow control setting.
  - To modify a flow control setting, you must first delete the previous setting and add a new flow control setting.
4. Click OK and click Start to restart the job.

- View a migration report

1. On the Migration Jobs page, locate a job and click Manage next to the job.
2. Click Generate Migration Report. After a report is generated, click Export to export the report.

In a migration report, the following file names appear in the File list section:

- The name of a file ends with `_total_list`. This file contains a list of total migration files.
  - The name of a file ends with `_completed_list`. This file contains a list of successful migration files.
  - The name of a file ends with `_error_list`. This file contains a list of failed migration files.
3. In the target NAS, locate the automatically generated folder `aliyun_mgw_import_report`. The three files that appear in the migration report are included in this folder. You can download and view a detailed list of files.

The file formats are as follows:

- The file name includes the source data address, file name, file size (measured in bytes), and last modified time. This file contains a list of total migration files. The format of a source data address is `nas ://< the name of a mount point >:/< prefix >/< objectName >`. For example, `nas :// 0a28888892 - afr82 . cn - hangzhou . nas . aliyuncs . com :/ myprefix / testfile . txt`.
  - The file name includes the file name, file size (measured in bytes), checksum (CRC64), and migration completion time. This file contains a list of successful migration files.
  - The file name includes the file name, migration start time, migration end time, and error description. This file contains a list of failed migration files.
- Retry after a migration failure

If a migration job failed, you can view the generated file whose name ends with `_error_list` to find the causes of failure and troubleshoot the issue. On the Migration Jobs page, locate the failed job, click Manage next to the job, and click Retry to migrate failed files.

## Manage synchronization jobs

- View the status of a synchronization job

After you create a synchronization job, one of the following states can occur:

- **Migrating:** the synchronization task is in progress.
- **Stopped:** Click **Manage** next to a synchronization job to enter the Migration Report page. After you click **Stop**, the job status changes to **Stopped**.
- **Create Failed:** indicates that you failed to create a synchronization job. You can view the causes of failure and recreate a synchronization job.

- Manage a synchronization job

- **View the details of a synchronization job:** On the Migration Jobs page, click **Manage** next to a synchronization job to view the job details, such as Basic, Schedule, and Flow Control Time schedule.
- **Stop or start a synchronization job:** On the Migration Report page, you can stop or start the synchronization job at any time.
- **View the history of a job:** On the Migration Jobs page, locate a job and click **Check History** next to the job to view the job history.

■ After a synchronization job is complete, one of the following states for a task is displayed:

- **Scanning:** indicates that a synchronization job is scanning the files of the source data address. The number of scanned files is displayed in the File Count column.
- **Scan Finished:** indicates that a scan is complete. The total number and size of files are display in the File Count and File Size columns, respectively.
- **Success:** indicate that a synchronization job is complete. The number of synchronized files is displayed. You can click  next to **Completed** to download the list of completed files.
- **Failed:** An error may occur when you run a synchronization job. Click **Retry** to resynchronize failed files. You can click  next to **Failed** to download the list of failed files. Based on the list, you can view the details of failed files, such as deleted or lost source files.

## More information

For more information, see the following topics:

- [Migrate data between Alibaba Cloud Object Storage Service \(OSS\) buckets](#)
- [Migrate data from HTTP/HTTPS sources to OSS](#)
- [Migrate data from Tencent Cloud Object Service \(COS\) to OSS](#)
- [Migrate data from Amazon Simple Storage Service \(Amazon S3\) to OSS](#)
- [Migrate data from Azure Blob to OSS](#)
- [Migrate data from Qiniu Cloud-Object Storage \(KODO\) to OSS](#)
- [Migrate data from Baidu Object Storage \(BOS\) to OSS](#)
- [Migrate data from Kingsoft Standard Storage Service \(KS3\) to OSS](#)
- [Migrate data from UPYUN Storage Service \(USS\) to OSS](#)
- [Migrate data from Google Cloud Storage to OSS](#)
- [Migrate data from NAS to OSS](#)
- [Migrate data from ECS instances to OSS](#)