

Alibaba Cloud

Data Online Migration
Migrate data from NAS to OSS

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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 <code>cd /d C:/window</code> command to enter the Windows system folder.
<i>Italic</i>	Italic formatting is used for parameters and variables.	<code>bae log list --instanceid</code> <i>Instance_ID</i>
[] or [a b]	This format is used for an optional value, where only one item can be selected.	<code>ipconfig [-all -t]</code>
{ } or {a b}	This format is used for a required value, where only one item can be selected.	<code>switch {active stand}</code>

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1. Background information

This topic describes how to migrate data from Network Attached Storage (NAS) to Object Storage Service (OSS).

 **Notice** By default, Data Transport does not support cross-country data migration. For example, you cannot migrate data from a data address that is located in China (Beijing) to a data address that is located in US (Silicon Valley). If you have similar requirements, you must [submit a ticket](#) before creating a migration job to apply for the permission of creating a cross-country migration job. You must ensure that your business is legitimate, data does not include illegal information, and data transit conforms to local rules and regulations.

This guide includes the following topics:

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

2. Prerequisites

This topic describes the operations that you must perform before you migrate data from a Network Attached Storage (NAS) file system to an Object Storage Service (OSS) bucket.

Additional considerations

If the Apsara File Storage NAS file system and the OSS bucket that you use in a migration job belong to different Alibaba Cloud accounts, we recommend that you log on to the [Data Transport console](#) with the account to which the NAS file system belongs.

Mount the NAS file system


- Mount an Apsara File Storage NAS file system
 - You must mount your Apsara File Storage NAS file system on an Elastic Compute Service (ECS) instance. For more information, see [Mount an NFS file system on a Windows ECS instance](#).
 - If you configure a permission group for the Apsara File Storage NAS file system, you must add all IP addresses in the virtual private cloud (VPC) in which the ECS instance is deployed to the authorized address list. For more information, see [Manage a permission group](#).
- Mount a NAS file system that is not deployed on Alibaba Cloud
 - You must connect your NAS server to an Alibaba Cloud VPC.
 - To allow access to your NAS server over an Alibaba Cloud VPC, you can connect the NAS server to the VPC by using an Express Connect circuit. For information about how to deploy an Express Connect circuit, contact Alibaba Cloud Technical Support.
 - You can also connect your NAS server to the VPC over a VPN network.
 - If access to the NAS server is restricted, you must configure the access policy of the NAS server to allow access from all IP addresses in the VPC to which the NAS server is connected.

Create a destination OSS bucket

Create a destination bucket to store the migrated data. For more information, see [Create buckets](#).

Create a Resource Access Management (RAM) user and grant required permissions to the RAM user.

1. Log on to the [RAM console](#).
2. In the left-side navigation pane, choose **Identities > Users**.
3. On the **Users** page, click **Create User**.
4. On the **Create User** page, specify Logon Name and Display Name in the User Account Information section.
5. In the Access Mode section, select Console Access and OpenAPI Access. Then, save the generated logon name, password, AccessKey ID, and AccessKey secret.
 - Console Access: If you select this option, you must configure the console password, password reset settings, and multi-factor authentication settings.
 - OpenAPI Access: If you select this option, an AccessKey pair is automatically created for the RAM user. The RAM user can call API operations or use other development tools to access Alibaba Cloud resources.

 **Note** If you need to migrate data across accounts, you must save the logon name, password, AccessKey ID, and AccessKey secret that are generated for each RAM user by the corresponding Alibaba Cloud account.

6. After the RAM user is created, return to the **Users** page. Find the RAM user and click **Add Permissions** in the Actions column. In the panel that appears, select the AliyunOSSFullAccess and AliyunMGWFullAccess policies and click OK. This way, the RAM user is granted the permissions to read and write files from OSS and perform online data migrations.
7. In the left-side navigation pane, click **Overview**.
8. On the page that appears, navigate to the Account Management section and click the link under RAM user logon. On the page that appears, enter the logon name and password of the RAM user to log on to the Alibaba Cloud Management Console.

3. Migrate data

This topic describes how to migrate data by using Data Transport.

Precautions


When you perform online migration, take note of the following items:


- A migration task occupies the network resources of the source and destination data addresses. To ensure business continuity, we recommend that you configure a rate limit for migration jobs or run migration jobs during off-peak hours.
- Before the system starts a migration job, the system checks the files at the source data address and the destination data address. If a source file and a destination file have the same name and the source file is updated later than the destination file, the destination file is overwritten. If you want to keep both files, we recommend that you change the name of one file or backup the destination file.
- Symbolic links that exist at the source data address are skipped during the migration.
- Empty directories that exist at the source data address are skipped during the migration.

Step 1: Create a source data address

1. Log on to the [Alibaba Cloud Data Transport console](#).
2. In the left-side navigation pane, choose **Data Online Migration > Data Address**. On the page that appears, click **Create Data Address**.
3. In the **Create Data Address** panel, configure the parameters and click **OK**. The following table describes the parameters.

Parameter	Required	Description
Data Type	Yes	Select NAS .
Data Name	Yes	Enter a name. The name must be 3 to 63 characters in length. The name cannot contain special characters except for hyphens (-) and underscores (_)
Data Region	Yes	Select the region where the Network Attached Storage (NAS) file system is located. If you set the NAS Type parameter to Alibaba Cloud, select the region where the Apsara File Storage NAS file system is located. If you set the NAS Type parameter to Others, select the region of the Alibaba Cloud virtual private cloud (VPC) to which the third-party NAS file system is attached.

Parameter	Required	Description
NAS Type	Yes	Select the source NAS file system based on the actual conditions. <ul style="list-style-type: none">Alibaba Cloud: a NAS file system that is created on Alibaba Cloud.Others: a NAS file system that is created on a third-party platform. You must mount the file system to an Alibaba Cloud VPC.
File System	This parameter is required only if you set the NAS Type parameter to Alibaba Cloud.	Select the NAS file system whose data you want to migrate.
Mount Point	This parameter is required only if you set the NAS Type parameter to Alibaba Cloud.	Select the mount target of the NAS file system. <div> Notice You can mount the NAS file system only to a target that resides in a VPC. Mount targets in the classic network are not supported.</div>
VPC	This parameter is required only if you set the NAS Type parameter to Others.	Select a VPC to which the NAS file system is mounted.
Switches	This parameter is required only if you set the NAS Type parameter to Others.	Select a vSwitch for the NAS file system.
NAS Address	This parameter is required only if you set the NAS Type parameter to Others.	Enter the IP address of the NAS server. This IP address must be accessible to the VPC.

Parameter	Required	Description
Sub Folder	No	<p>Enter the directory in which the data you want to migrate is stored. If you do not specify this parameter, the default value is the root directory (/).</p> <div> Notice If you specify a subdirectory, make sure that the subdirectory exists on the NAS server. Otherwise, the source data address fails to be created.</div>
Connection Method	This parameter is required only if you set the NAS Type parameter to Others.	Select a protocol type.
Connection Password	This parameter is required only if you set the NAS Type parameter to Others.	<p>Specify whether a password is required.</p> <ul style="list-style-type: none">◦ No Password: No password is required to access the NAS service.◦ Use Password: A username and a password are required to access the NAS service. You must enter a valid username and password.

 **Note** For more information about the status of a data address, see .

4. (Optional)If the system prompts that the feature is in public preview, click **Application** to apply to use the feature.
5. (Optional)Enter the required information and submit the application. After the application is approved, the system notifies you by text message.

Step 2: Create a destination data address

1. In the left-side navigation pane, choose **Data Online Migration > Data Address**. On the page that appears, click **Create Data Address**.
2. In the **Create Data Address** panel, configure the parameters and click **OK**. The following table describes the parameters.


Parameter	Required	Description
Data Type	Yes	Select OSS .

Parameter	Required	Description
Data Name	Yes	Enter a name. The name must be 3 to 63 characters in length. The name cannot contain special characters except for hyphens (-) and underscores (_)
Data Region	Yes	Select the region where the destination data address is located.
Enable Transfer Acceleration	No	<p>For Data Online Migration to use the transfer acceleration feature provided by Object Storage Service (OSS), you must enable the transfer acceleration feature for buckets. The transfer acceleration feature takes effect within 30 minutes after it is enabled. After you enable the feature, wait for 30 minutes before you create a migration job.</p> <div>  Notice If you use the transfer acceleration feature to access your OSS buckets, you are charged additional fees for transfer acceleration. For more information, see Transfer acceleration. </div>
OSS Endpoint	Yes	Select an endpoint based on the region in which your data is stored. For more information, see Regions and endpoints .
AccessKey Id	Yes	Specify the AccessKey pair that is used to migrate data. For more information, see Create a Resource Access Management (RAM) user and grant required permissions to the RAM user .
AccessKey Secret	Yes	
OSS Bucket	Yes	Select a bucket to store the migrated data.
OSS Prefix	No	An OSS prefix cannot start with a forward slash (/) but must end with a forward slash (/). For example, you can specify <code>data/to/oss/</code> as the OSS prefix. If you want to migrate data to the root directory of the specified bucket, do not specify this parameter.

Step 3: Create a migration job

1. In the left-side navigation pane, choose **Data Online Migration > Migration Jobs**. On the page that appears, click **Create Job**.
2. In the **Create Job** panel, read the terms of the migration service and select **I understand the above terms and conditions, and apply for opening data migration service**. Then, click **Next**.
3. In the **Fee Reminder** dialog box, click **Yes, Go Ahead**.
4. In the **Job Config** step, configure the parameters and click **Next**. The following table describes the

parameters.


Parameter	Required	Description
Job Name	Yes	Enter a job name. The name must be 3 to 63 characters in length and can contain only lowercase letters, digits, and hyphens (-). It cannot start or end with a hyphen (-).
Source Data Address	Yes	Select the source data address that you created.
Destination Data Address	Yes	Select the destination data address that you created.
Specified Directory	No	<p>Specify directories in which the files and subdirectories are migrated or not migrated.</p> <ul style="list-style-type: none"> ◦ Do not filter: All data from the source data address is migrated. ◦ Exclude: The files and subdirectories in the specified directories are not migrated. ◦ Contain: Only the files and subdirectories in the specified directories are migrated. <div> <p> Note</p> <ul style="list-style-type: none"> ◦ Before you configure the Specified Directory parameter, you must configure a whitelist. For more information, see Advanced features. ◦ A directory name cannot start with a forward slash (/) or a backslash (\), and cannot contain double slashes (/), double periods (..), or double quotation marks ("). The character string that consists of all the specified directory names cannot exceed 10 KB in length. ◦ A directory name must end with a forward slash (/). For example, you can specify <i>docs/</i> as the directory name. ◦ You can specify up to 20 directories of the Exclude or Contain type. </div>
		<p>Select the data migration mode.</p> <ul style="list-style-type: none"> ◦ Full: The system migrates all data from the source data address to the destination data address. You must configure the Start Time Point of File parameter. The system migrates all data whose last modification time is later than the specified time. After all data is

Parameter	Required	Description
Migration Type	Yes	<p>migrated, the migration job ends.</p> <p>If you change the data at the source data address after the migration job is completed, you can submit another job to migrate all data. In this case, the system migrates only the changed data.</p> <ul style="list-style-type: none"> ◦ Incremental: The system runs a migration job based on the values that you specified for the Migration Interval and Migration Times parameters. <ul style="list-style-type: none"> ■ You must configure the Start Time Point of File parameter. During the first migration, the system migrates all data whose last modification time is later than the specified time. After the first migration job is completed, incremental migration jobs are performed based on the value that you specified for the Migration Interval parameter. For each incremental migration, the system migrates only the data that is created or modified after the previous migration starts and before the current migration starts. ■ If you set the Migration Times parameter to N, full migration is performed once and then incremental migration is performed (N - 1) times. <p>For example, the current time is 08:00, March 10, 2019 and you set the Migration Interval parameter to 1, the Migration Times parameter to 5, and the Start Time Point of File parameter to 08:00, March 5, 2019. When the first migration starts, the system migrates all files whose last modification time is between 08:00, March 5, 2019 and 08:00, March 10, 2019. In this example, the first migration requires one hour to complete and the second migration starts at 10:00, March 10, 2019. The duration from 08:00 to 10:00 consists of one hour for the first migration process and one hour for the migration interval. During the second migration, the system migrates the files whose last modification time is between 08:00, March 10, 2019 and 10:00, March 10, 2019. The migration job consists of one full migration and four incremental migrations.</p>


Parameter	Required	Description
		<p>Notice Before you start a full or incremental migration job, the system compares the files at the source data address with the files at the destination data address. If a source file has the same name as a destination file, the destination file is overwritten when one of the following conditions is met:</p> <ul style="list-style-type: none"> ◦ The Content-Type values of the source file and the destination file are different. ◦ The last modification time of the source file is later than that of the destination file.
Start Time Point of File	Yes	<p>Specify a time to filter data to be migrated. Data will be migrated if it is created or modified after the specified time.</p> <ul style="list-style-type: none"> ◦ The size of the source file is different from that of the destination file. ◦ All: All files are migrated. ◦ Assign: Only the files that are created or modified after the specified time are migrated. <p>For example, if you set the time to 08:00:00, November 1, 2018, only the files that are created or modified after 08:00:00, November 1, 2018 are migrated.</p>
Migration Interval	This parameter is required when you set the Migration Type parameter to Incremental.	The default value is 1 and the maximum value is 24. Unit: hours.
Migration Times	This parameter is required when you set the Migration Type parameter to Incremental.	The default value is 1 and the maximum value is 30.

Parameter	Required	Description
File Overwrite Method	Yes	<p>The method that is used to process the source file whose name is the same as that of a destination file. Valid values:</p> <ul style="list-style-type: none"> ◦ LastModified: If a source file has the same name as a destination file, the system compares the last modification time that is indicated by the LastModified property of the files. <ul style="list-style-type: none"> ■ If the last modification time of the source file is later than that of the destination file, the source file is migrated and the destination file is overwritten. ■ If the last modification time of the source file is earlier than that of the destination file, the source file is not migrated and the destination file is retained. ■ If the two files have the same last modification time, the system checks the values of the Size and Content-Type properties of the files. <p>If the files have the same Size and Content-Type values, the source file is not migrated. If the two files have different values of at least one property, the source file is migrated and the destination file is overwritten.</p> ◦ Condition: If a source file has the same name as a destination file, the system compares the values of the LastModified, Size, and Content-Type properties of the two files. <ul style="list-style-type: none"> ■ If all property values of the two files are the same, the source file is not migrated. ■ If the two files have different values of at least one property, the source file is migrated and the destination file is overwritten. ◦ All: If a source file has the same name as a destination file, the system performs no comparison and directly overwrites the destination file with the source file. ◦ No: If a source file has the same name as a destination file, the system performs no comparison and directly skips the source file in the migration.

5. In the **Performance** step, navigate to the **Data Prediction** section and configure the **Data Size** and **File Count** parameters.

 **Note** To ensure a successful migration, we recommend that you estimate the amount of data that you want to migrate as accurately as possible. For more information, see [Estimate the amount of data that you want to migrate](#).

6. (Optional) In the **Performance** step, navigate to the **Flow Control** section, specify the **Time Range** and **Max Flow(MB/s)** parameters, and then click **Add**.

 **Note** To ensure business continuity, we recommend that you configure the **Time Range** and **Max Flow(MB/s)** parameters based on the traffic fluctuations.

7. Click **Create** and wait until the migration job is completed.

Success stories

For examples of migrating data from a NAS file system to an OSS bucket, see [Migrate data from an on-premises NAS file system to OSS for an entertainment company](#).

4. Manage migration jobs

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

Subsequent operations vary with the types of migration jobs. You can manage migration jobs of different types as follows.

Manage full migration and incremental migration jobs


- View the status of a full or incremental migration job

After a full or incremental migration job is created, it enters one of the following states:

- Migrating. This state indicates that data is being migrated. Wait until the migration job is completed.
- Create Failed. This state indicates that the migration job has failed to be created. You can view the cause of failure and create a migration job again.
- Completed. This state indicates that the migration job is completed. You can view the migration report.
- Failed. This state indicates that the migration job has failed. You can view the migration report and migrate the files again.

- Modify the throttling settings of a migration job

During migration, you can modify the throttling settings of a migration job based on your needs.

- In the **Data Transport console**, choose **Data Online Migration > Migration Jobs**. On the Migration Jobs page, find the migration job and click **Manage**.
- Click **Stop** and confirm that the job is stopped.
- On the Flow Control Time Schedule chart, click **Reset**.
 - To add a throttling setting, select an appropriate time range and maximum flow, and then click **Add**.
 - To delete a throttling setting, click  next to the throttling setting.
 - To modify a throttling setting, you must delete the current setting. Then, you can add a new throttling setting.
- Click **OK** and then click **Start** to restart the job.

- View a migration report

- On the Migration Jobs page, find the migration job and click **Manage**.
- Click **Generate Migration Report**. After a report is generated, click **Export** to export the report.

In a migration report, the following files appear in the **File lists** section:

- The file whose name ends with `_total_list`. This file lists all files that need to be migrated.
- The file whose name ends with `_completed_list`. This file lists the files that are migrated.
- The file whose name ends with `_error_list`. This file lists the files that have failed to be migrated.

- iii. In the **Object Storage Service console**, find the generated folder *aliyun_mgw_import_report/*. The folder includes the three files listed in the migration report. You can download the files and view the detailed list included in each file. We recommend that you use the **ossbrowser** tool to view these files.

Each list consists of the following columns:

- The columns of the file whose name ends with `_total_list` include the source data address, file name, source version ID, and destination version ID. The columns also display whether the job version is the latest at the source data address and whether the job version is deleted at the source data address. The last two columns display the file size (measured in bytes) and the time when the file was last modified. The format of a source data address is `<vendor>://<bucketName>/<prefix>/<objectName>`. The following string provides an example: `oss://bucket-test1022/myprefix/testfile.txt`.
- The columns of the file whose name ends with `_completed_list` include the file name, the source version ID, and the destination version ID. The columns also display whether the job version is the latest at the source data address and whether the job version is deleted at the source data address. The last four columns display the file size (measured in bytes), CRC-64 checksum, time when the migration job was completed, and whether the migration was skipped.

Note Skip migration: indicates whether the file that has the same name at the source data address and the destination data address has been skipped during migration. Valid values: 1 and 0. The value 1 indicates that the file has been skipped during migration. The value 0 indicates that the file has not been skipped during migration. The value of this field depends on the value of the **File Overwrite Method** parameter that you specify when you create the migration job.

- The columns of the file whose name ends with `_error_list` include the file name, the source version ID, and the destination version ID. The columns also display whether the job version is the latest at the source data address and whether the job version is deleted at the source data address. The last three columns display the time when the migration job started, the time when the migration job ended, and the error description.

Note The following four fields apply only if multi-version migration is enabled:

- Source version ID: the version ID of the file at the source data address.
- Destination version ID: the version ID of the file at the destination data address.
- Latest at source data address: indicates whether the current version is the latest version of the file at the source data address. Valid values: true and false.
- Deleted at source data address: indicates whether the current version is deleted at the source data address. Valid values: true and false.

- Retry a job after a migration failure

If a migration job fails, you can check the generated file whose name ends in `_error_list` to identify the cause of failure and resolve the issue. On the Migration Jobs page, find the failed job, click **Manage**, and click **Retry** to migrate the files of the job again. For more information, see **Common causes of a migration failure and solutions**.

Manage synchronization jobs

- View the status of a migration job

A migration job enters one of the following states after being created:

- Migrating. This state indicates that the migration job is in progress.
- Stopped. If you click **Manage** next to a job and then click **Stop** on the Migration Report page, the status of the job changes to Stopped. This state indicates that the job stops after the current files are synchronized.
- Create Failed. This state indicates that the migration job fails to be created. You can view the cause of failure and create a migration job again.

- Manage migration jobs

- View the details of a migration job: On the Migration Jobs page, click **Manage** to view the job details in the **Basic**, **Schedule**, and **Flow Control Time Schedule** sections.
- Stop or start a migration job: On the **Migration Report** page, you can stop or start a migration job at any time.
- View the history of a job: On the Migration Jobs page, find the job and click **Check History** to view the job history.

After a migration job is completed, it enters one of the following states:

- Scanning. This state indicates that the files of the source data address are being scanned. The number of scanned files is displayed in the File Count column.
- Scan Finished. This state indicates that a scan is complete. The total number and size of files are displayed in the File Count and File Size columns.
- Success. This state indicates that a synchronization job is completed. The number of synchronized files is displayed. You can click next to



to download the list of files that have been synchronized.

- Failed: An error may occur when you run a synchronization job. Click **Retry** to synchronize the files that fail to be synchronized again. You can click



next to **Failed** to download the list of files that failed to be synchronized. You can view the details of the files and identify the failure cause. For example, one or more source files were deleted or lost during synchronization.