Alibaba Cloud
Apsara File Storage NAS

FAQ

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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.	 Danger: 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.	 Warning: 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.	 Notice: 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.	 Note: You can use Ctrl + A to select all files.
>	Multi-level menu cascade.	Settings > Network > Set network type
Bold	It is used for buttons, menus , page names, and other UI elements.	Click OK.
`Courier font`	It is used for commands.	Run the `cd /d C:/windows` command to enter the Windows system folder.
Italics	It is used for parameters and variables.	`bae log list --instanceid` *Instance_ID*
[] or [a|b]	It indicates that it is a optional value, and only one item can be selected.	`ipconfig` *[-all|-t]*

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

Contents

1 FAQs

1.1 Regions and supported storage types and protocols

The functions that NAS supports vary depending on regions.

A region refers to a physical data center. After you create a file system, you can no longer change the region of the file system.

The following table shows the storage types, protocols, and zones supported in different regions.

- Mainland China:

Region	City	Supported storage types, protocols, and zones
China North 1	Qingdao	Capacity: NFS, SMB Zones: C
China North 2	Beijing	- Performance: NFS, SMB Zones: C, E - Extreme Zones: A, B, C, D, E, F
China North 3	Zhangjiakou	- Performance: NFS, SMB Zones: B - Extreme Zones: A, B
China North 5	Hohhot	- Capacity: NFS, SMB Zones: A - Performance: NFS, SMB Zones: A

Region	City	Supported storage types, protocols, and zones
China East 1	Hangzhou	- Capacity: NFS, SMB Zones: B, G - Performance: NFS, SMB Zones: G, F - Extreme Zones: B, E, F, H, I
China East 2	Shanghai	- Capacity: NFS, SMB Zones: B - Performance: NFS Zones: B - Extreme Zones: A, B, C, D, E, F
China South 1	Shenzhen	- Capacity: NFS, SMB Zones: A, D - Performance: NFS, SMB Zones: A, B, D - Extreme Zones: A, B, C, D, E

· Other regions:

Region	City	Supported storage types, protocols, and zones
China (Hong Kong)	Hong Kong	- Capacity: NFS, SMB Zones: B - Performance: NFS, SMB Zones: B

Region	City	Supported storage types, protocols, and zones
Asia Pacific SE 1	Singapore	- Capacity: NFS, SMB Zones: A - Performance: NFS, SMB Zones: A
Asia Pacific SE 2	Sydney	- Capacity: NFS, SMB Zones: A - Performance: NFS, SMB Zones: A
Asia Pacific SE 3	Kuala Lumpur	Capacity: NFS, SMB Zones: A
Asia Pacific SE 5	Jakarta	Capacity: NFS, SMB Zones: A
Asia Pacific NE 1	Tokyo	Capacity: NFS, SMB Zones: A, B
Asia Pacific SOU 1	Mumbai	- Capacity: NFS, SMB Zones: A - Performance: NFS, SMB Zones: A
EU Central 1	Frankfurt	- Capacity: NFS, SMB Zones: A - Performance: NFS, SMB Zones: A
UK	London	- Capacity: NFS, SMB Zones: A - Performance: NFS, SMB Zones: A

Region	City	Supported storage types, protocols, and zones
US West 1	Silicon Valley	- Capacity: NFS, SMB Zones: B - Performance: NFS, SMB Zones: B
US East 1	Virginia	- Capacity: NFS, SMB Zones: A - Performance: NFS, SMB Zones: A

1.2 Why do I need RAM permissions to create a mount point in a classic network

Unlike Virtual Private Cloud (VPC) environments, classic network environments are not isolated at the network layer. To ensure data security of your NAS file system, NAS must be authorized through RAM to list your ECS instances. This makes sure that only your own ECS instances can mount or access the NAS file system. Note that the NAS file system and the ECS instance must be under the same Alibaba Cloud account.

Note:

- NAS is only granted permission to call your `DescribeInstances` interface and has no permission to call any other instances. ECS instances acquired by NAS through the `DescribeInstances` interface are only used for permission verification, and are not recorded in any form.
- Do not delete or edit `AliyunNASD efaultRole` in RAM as it may cause an operation exception error or failure when mounting the file system.

1.3 What is NAS and where can I use it

Alibaba Cloud Network Attached Storage (NAS) is a highly reliable, highly available file storage service featuring a distributed file system with unlimited capacity and performance scaling, with namespace and multiple client access support.

NAS supports standard file access protocols, so existing applications do not need to be modified. Furthermore, NAS supports multiple computing nodes (such as ECS instances, E-HPC, and Container Service) simultaneously reading or writing data to the file system.

Scenarios that benefit from Alibaba Cloud ECS instances using NAS include:

- Deploying services using Server Load Balancer and multiple ECS servers (such as web servers) for scenarios where multiple ECS servers need to access the same bucket to share data.
- Sharing logs for when apps on multiple ECS servers need to write logs to the same bucket to facilitate concentrated log data processing and analysis.
- Sharing files where NAS enables you to store your enterprises public files in a centralized manner and share data to multiple business groups, all while maintaining data security.

1.4 Is there a NAS terminology

Alibaba Cloud NAS (Network Attached Storage) provides an infinitely scalable file system to store data for ECS servers, and primarily involves the following concepts:

- File system: The file system is a NAS instance. You can mount the file system on an ECS server, E-HPC, or Container Service, and then use it like a local file system.
- Mount point: A mount point is the entry through which a computing node accesses NAS. It defines what type of network computing node can access NAS, and what permissions are required to access NAS.
- Permission group: A permission group defines NAS access permissions, including authorized IP addresses, read/write permissions, and user permissions.

1.5 How many file systems can an account create

Each Alibaba Cloud account can create up to 10 file systems. The maximum storage capacity of each file system is 1 PB (performance type) or 10 PB (capacity type).

1.6 What protocols does NAS support

NAS supports the following protocols:

1. NFS V3.0 and NFS v4.0.
2. SMB 2.1 and later versions, with corresponding support for Windows 7, Windows Server 2008 R2 and all later versions of Windows, but does not support Windows Vista, Windows Server 2008 and earlier versions.

1.7 What is a mount point and where can I use it

A mount point is the interface for computing nodes (such as ECS instance, E-HPC, or Container Service) to access a NAS file system.

Mount points define the network type of the computing nodes and the permissions required to access NAS.

One mount point can be simultaneously mounted by multiple computing nodes, enabling shared access.

1.8 What is a permission group and where can I use it

A permission group defines NAS access permissions, including authorized IP addresses, read/write permissions, and user permissions.

1.9 Does NAS support inotify

While inotifywait is commonly used in combination with rsync to backup/synchronize data on a quasi-real-time basis, it may not work properly on NAS file systems due to the implementation of inotify.

How inotify works

inotify is a sub-module of the Linux kernel, and inotifywait is the user-mode interface of inotify. inotify is realized at the VFS layer. When file operations reach the VFS layer, the inotify module sends the operation type (creation/deletion/attribute change , and so on) and operation object (file name) to the user-mode, and the user-mode inotifywait then outputs the operation information to the user.

Problem

Because inotify is implemented at the VFS layer of the kernel, the local kernel cannot recognize operations made by a remote client on the NFS file system. Therefore, inotify cannot recognize modifications on files made by the remote client.

If you Mount the same NAS file system simultaneously on Client A and Client B, and enable inotifywait at Client A to monitor the mounted directory, the following occurs:

- inotifywait recognizes operations on files in the mounted directory on Client A.
- inotify cannot recognize any operation on files in the mounted directory on Client B.

Solution

An alternative solution is to use FAM.

FAM is a library used for monitoring files or directories, and it is fully implemented in user-mode. You then only need to run a daemon in the background to regularly scan the directory and check for file changes.

However, using FAM has the following issues:

- You must write a program to call the FAM interface implementation function.
- In scenarios with a large number of files, using FAM may have poor performanc e and consume a lot of resources. Furthermore, it cannot ensure real-time monitoring.

1.10 How is NAS charged

NAS storage can be charged as a Pay-As-You-Go service, or subscription packages.

- If you select Pay-As-You-Go, fees are based on the actual usage.
- If you select a subscription package, you can assign the package to a file system to cover usage. Any resource usage that exceeds the purchased capacity is charged at the Pay-As-You-Go billable level. You can upgrade or renew a subscription package during it’ s validity period, however, you cannot downgrade a subscripti on package.

For more charging information about NAS, see #unique_14.

1.11 Can I switch the type of Apsara File Storage NAS file systems?

This topic describes how to switch the type of an Apsara File Storage NAS file system.

You cannot switch the type of the file system after it is created.

You can create a new file system if you no longer want to use the original file system.

- If the file system does not store any data
  1. Create a new file system and mount it on an ECS instance. For more information, see Quick start.
  2. Delete the original file system.
- If the file system stores data
  1. Create a new file system and mount it on an ECS instance. For more information, see Quick start.
  2. Migrate the data in the original file system to the new system. For more information, see Migrate data between Apsara File Storage NAS file systems.
  3. Delete the original file system.

1.12 Can I switch the type of a mount target?

This topic describes how to switch the type of a mount target.

If you have added a mount target for a file system, you cannot switch the type of the mount target. You can create a new mount target and mount the file system on the instance again.

For example, you have created an Apsara File Storage NAS Capacity file system and have mounted the file system on an instance through a mount target in a classic network. If you want to switch the mount target in a virtual private cloud (VPC), perform the following steps:

Note:

You can add two mount targets for an Apsara File Storage NAS Capacity file system or an Apsara File Storage NAS Performance file system. However, you can only add one mount target in a VPC for an Apsara File Storage NAS Extreme file system.

1. Add a mount target in a VPC. For more information, see #unique_19/unique_19_Connect_42_section_6xi_a3u_zkq.
2. Unmount the file system which is mounted on the instance through the mount target in a classic network. For more information, see Unmount a file system.
3. Use the mount target in the VPC to mount the file system on the same target path of the instance. For more information, see Mount a file system.
4. Make sure that no client is mounted on the instance in the NAS console.

   You can click the The client is mounted button in the mount point section of the file system details page to view the mounted clients.
5. Disable the mount target in the classic network.
6. After you make sure that your business is not adversely affected, delete the mount target in the classic network.

2 Scale and Performance

2.1 What impacts the I/O performance of Windows service SMB protocol

Symptom

By default, the `large mtu` option is disabled on a Windows SMB client, which affects the increase in I/O performance.

Solution

You can modify the following registry key to enable the `large mtu` option:

HKLM \ System \ CurrentCon trolSet \ Services \ LanmanWork station \ Parameters

Create a `DWORD` at this location with the key named `DisableLar geMtu` and value set to `0`. Restart the file system to apply the change.

2.2 Does capacity affect performance in NAS

Yes. The maximum throughput performance of an individual file system is linearly related to the storage space of the file system. The higher the storage capacity, the higher the throughput performance.

For more information on the detailed relationship between storage and performance, see the article "Relationship between Throughput Capacity and Storage Space" on the Pricing Page.

2.3 How to improve performance when using IIS to access NAS

Problem description

When IIS accesses a file by using a NAS share, the backend of IIS will frequently access NAS. Unlike accessing a local file system, you must interact with networks when accessing NAS. Even if it takes a short time for each interaction, the total amount of time increases with an increasing number of clients.

Solutions

For more information, see SMB2 Client Redirector Caches Explained.

You can increase the values of the following registry keys. For example, you can change the values to 600 or above.

The path of the registry key is `HKEY_LOCAL _MACHINE \ SYSTEM \ CurrentControlSet \ services \ LanmanWork station \ Parameters .`

The registry keys are listed as follows:

- FileInfoCacheLifetime
- FileNotFoundCacheLifetime
- DirectoryCacheLifetime

Note:

- When none of the preceding keys exists, troubleshoot the issue as follows:
  1. Ensure that SMB is used rather than NFS.
  2. Ensure that the current version of Windows supports these registry keys. When the current version of Windows supports these registry keys but they do not exist, you can manually create these registry keys. For more information, see Performance tuning for file servers.
- For web files that are frequently accessed by IIS, such as js and css scripts, we recommend that you move these files to a local PC.

2.4 SMB basic operation FAQ

Why is the disconnected state displayed when I use the net use command to view the status of a mount point?

If no operation is performed on a file system within 15 minutes, the connection is disconnected. The connection is established whenever an operation starts.

What is the maximum capacity and performance of a CIFS or SMB file system?

Currently, when an SMB file system is deployed on a NAS Capacity cluster, the maximum capacity and bandwidth for a single file system are subject to NAS Capacity. Other features, such as supports for a unique namespace, VPCs, and classic networks are the same as those of an NFS file system.

For more information, see Network Attached Storage.

Supported protocols and operating systems for an SMB file system

For more information, see #unique_27.

For more information about unsupported features for an SMB file system, see #unique_27/unique_27_Connect_42_section_ag9_ikx_0ku.

Restrictions when accessing an SMB file system

Similar to accessing an NFS file system, you cannot access an SMB file system from an ECS instance that is located in another region or from the Internet. You must connect to a VPC by using a dedicated leased line to access the file system.

To access a file system from external networks outside the VPC where the file system is located, see the following sections:

- Access NAS from an on-premises IDC using a VPN network
- Access NAS from an on-premises IDC using NAT
- Mount NAS file systems on ECS instances that are located in multiple VPCs
- Mount NAS file systems on ECS instances that are owned by multiple accounts

2.5 How can I modify the maximum number of concurrent NFS requests?

The maximum number of concurrent requests from an NFS client is limited to 2 by default, which reduces NFS performance. This topic describes how to modify the maximum number of concurrent NFS requests.

You can use one of the following methods to modify the maximum number of concurrent NFS requests. After using method 1 to modify the maximum number , you must restart the ECS instance. This may affect business continuity. You can use method 2 to modify the maximum number of concurrent NFS requests without restarting the ECS instance.

Method 1

1. Install an NFS client. For more information, see Install an NFS client.
2. Use the following commands to modify the maximum number of concurrent NFS requests.

```
echo " options sunrpc tcp_slot_t able_entri es = 128 " >> /
etc / modprobe . d / sunrpc . conf
```

```
echo " options sunrpc tcp_max_sl ot_table_e ntries = 128 "
>> / etc / modprobe . d / sunrpc . conf
```

Note:
You only need to perform the modification once after the NFS client is installed for the first time with root permissions. Then, you do not need to repeat the modification.

3. Use the following command to restart the ECS instance.

```
reboot
```

4. Mount a file system. For more information, see Mount an NFS file system.
5. Use the following command to verify the modification results.

   If the returned value is 128, the maximum number is modified.

```
cat / proc / sys / sunrpc / tcp_slot_t able_entri es
```

Method 2

1. Install an NFS client. For more information, see Install an NFS client.
2. Use the following commands to modify the maximum number of concurrent NFS requests.

```
echo " options sunrpc tcp_slot_t able_entri es = 128 " >> /
etc / modprobe . d / sunrpc . conf
echo " options sunrpc tcp_max_sl ot_table_e ntries = 128 "
>> / etc / modprobe . d / sunrpc . conf
```

Note:
You only need to perform the modification once after the NFS client is installed for the first time with root permissions. Then, you do not need to repeat the modification.

3. Mount a file system. For more information, see Mount an NFS file system.
4. Use the following command to modify the maximum number of concurrent NFS requests again.

```
sysctl - w sunrpc . tcp_slot_t able_entri es = 128
```

5. Unmount a file system. For more information, see #unique_20.
6. Re-mount a file system. For more information, see Mount an NFS file system.

7. Use the following command to verify the modification results.

   If the returned value is 128, the maximum number is modified.

```
cat  / proc / sys / sunrpc / tcp_slot_t  able_entri  es
```

2.6 Why is the speed of access to an NFS file system from a Linux client limited to several Mbit/s?

This topic describes why the speed of access to an NFS file system from an NFS client that runs Linux is limited to several Mbit/s and how you remove the limit.

The maximum number of concurrent NFS requests from an NFS client running Linux is limited to 2 by default, which reduces NFS performance.

After an NFS client is installed, you can modify the maximum number of concurrent NFS requests to improve NFS performance. For more information, see #unique_35.

2.7 Performance issues of Server Message Block

Latency issues before you perform I/O operations

When you access a Server Message Block (SMB) server by using a mount point, you need to wait for several minutes before performing I/O operations.

What can I do to reduce the waiting period when accessing an SMB server?

Solutions

The waiting period that occurs is mainly caused by an NFS client or Web client.

- Check whether an NFS client is installed. If the NFS client is no longer used, we recommend that you delete it.
- Locate the following registry key. The path to the registry key is: `HKEY_LOCAL _MACHINE -> System -> CurrentCon trolSet -> Control -> NetworkPro vider -> Order -> ProviderOr der`.

  Assume that the value of the ProviderOrder key is `LanmanWork station , RDPNP , Nfsnp`. You need to remove `, Nfsnp` and restart the ECS instance.
- When a Web client exists, this increases the latency when you access an SMB server by using a file manager. We recommend that you remove the Web client.

Note:

When a client connects to an SMB server for the first time, the latency is higher than expected. Check whether you can communicate with the mount address of the SMB server by using the ping command, or check if the latency for the communication is as expected.

- If a time-out error occurred while using the ping command, we recommend that you check the network settings.
- If the latency is higher than expected, we recommend that you ping the IP address of the SMB server. When the latency to ping the IP address of a mount point is lower than the latency to ping the domain name of the mount point, the issue may be caused by the DNS settings. We recommend that you check the DNS settings.

Procedure to solve performance issues

1. Modify the value of the `ProviderOr der` key. When the latency to access the SMB server is longer than usual, we recommend that you check this value.
2. You can use fio to conduct a performance test to check the issue.

```
fio . exe  -- name =./ iotest1  -- direct = 1  -- rwmixread = 0  --
rw = write  -- bs = 4K  -- numjobs = 1  -- thread  -- iodepth = 128
 -- runtime = 300  -- group_repo  rting  -- size = 5G  -- verify =
md5  -- randrepeat = 0  -- norandomma  p  -- refill_buf  fers  --
filename =\\< mount   point   dns >\ myshare \ testfio1

fio . exe  -- name =./ iotest1  -- direct = 1  -- rwmixread = 0  --
rw = write  -- bs = 4K  -- numjobs = 1  -- thread  -- iodepth = 128
 -- runtime = 300  -- group_repo  rting  -- size = 5G  -- verify =
md5  -- randrepeat = 0  -- norandomma  p  -- refill_buf  fers  --
filename =\\< mount   point   dns >\ myshare \ testfio1
```

3. For applications that use an SMB file system as data storage, try to perform read/write operations by using large data blocks. The smaller the data blocks, the more network resources are consumed. If you cannot modify the size of a data block, you can use `BufferedOu tputStream .`

3 Pricing

3.1 What is the difference between a storage package and storage capacity?

This topic describes the concepts of a storage package and storage capacity. It also provides details about the procedure to view the storage capacity of a file system.

Storage packages

The billing method for a storage package is subscription.

Assume that you create a NAS Capacity file system and link a storage package with a size of 500 GB to the file system. During a period from 7:00 to 8:00 on June 1, 2019, the maximum used capacity of the file system is 550 GB. When you are charged, 500 GB of the total 550 GB is covered by the storage package, while the remaining 50 GB is charged by using the pay-as-you-go billing method.

 Note:

The maximum storage capacity has no relation to the size of a storage package.

If you require more storage capacity as your business expands, you can upgrade the existing storage package to a higher specification. For more information, see #unique_39.

Storage capacity

Storage capacity indicates the available size for a file system that you can use to store data.

- Maximum capacity of NAS Extreme is 1 PB.
- Maximum capacity of NAS Capacity is 10 PB.

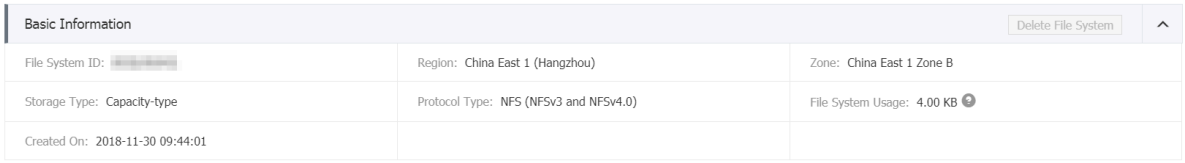
1. Log on to the NAS console.
2. Choose NAS > File System List.
3. Find the target file system, and click Manage to view the capacity of the file system on the File System Details page.

 Note:

On the File System Details page, the value of the File System Usage field indicates the maximum amount of used space for a file system over the last hour.

In Linux, you can run the `df -h` command to view the remaining capacity of a file system.

If the used space for a file system is zero, it indicates that no data is stored in the file system.



3.2 How can I stop being charged for NAS?

This topic describes how to stop being charged for Network Attached Storage (NAS).

For business continuity, you cannot disable the NAS service.

If the NAS service is no longer used, you can delete all mount points of each file system and then delete each file system. After all available resources are deleted, no charge is incurred by NAS at the next billing cycle. When the pay-as-you-go billing method is applied to NAS, you will receive a bill each hour.