Alibaba Cloud Network Attached Storage

Product Introduction

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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 Scenarios

To identify the target scenarios of Alibaba Cloud Network Attached Storage (NAS) more precisely, the application scenarios of NAS can be classified into the following five types:

Enterprise applications

With high scalability, elasticity, availability, and persistence, NAS can be used to store the files of enterprise applications and the applications delivered as services. NAS provides standard file system interfaces and semantics. Therefore, you can easily construct new applications or migrate your enterprise applications to Alibaba Cloud.

Media and entertainment workflows

Shared storage is used to process large files in media workflows, such as video editing, audio and video production, broadcast processing, and sound design and rendering. With the powerful data consistency model, high throughput, and shared file access, NAS can reduce the time required to complete the work flows and merge multiple local file repositories into a single repository that can be accessed by all users.

Big data analysis

NAS can provide the scale, performance, and features required by big data applications, for example, high throughput of computing nodes, post-write read consistency, and file operations with low latency. Many analysis workloads use file interfaces for data interactions and depend on file system semantics such as the file lock. In addition, the workloads also require to write a part of a file. NAS supports the required file system semantics and can provide scalable capacity and performance.

Content management and Web services

As a file system with high throughput and persistence, NAS can be used in content management systems and Web service applications to store and provide information for websites and online publishing and archiving applications. NAS follows the expected file system semantics, file naming conventions, and the privileges that Web developers are used to applying. Therefore, you can easily integrate NAS with Web applications and use it in websites and online publishing and archiving applications.

Container storage

Containers are ideal for microservices construction thanks to such features as fast presetting, portability, and process isolation. For the containers that access raw data at every start, a shared file system is required to allow these containers to access the file system no matter which instance they run on. NAS is ideal for container storage because it provides persistent shared access to file data.

2 Storage types

NAS provides two storage types: NAS normal and Cloud Paralled File System (CPFS).

- applies to distributed file storage scenarios and provides two product types: capacity type and SSD performance type.
- CPFS is a parallel file system. It is now in the beta testing phase.

The following table describes the advantages and application scenarios of each storage type:

Storage type	Advantage	Application scenario
Capacity type	Large capacity and low cost	Highly scalable and cost-sensitive workloads, such as big data analysis, file sharing, and data backup
SSD performance type	Low latency and high IOPS	Random I/O intensive and latency-sensitive workloads, such as enterprise applications, website containers, and searching tasks
CPFS	Low latency, high throughput, and parallel I/O	Highly parallel applications and workloads with high I/O and throughput, such as high-performance computing

3 NFS protocol limits

Network Attached Storage (NAS) supports the NFSv3 and NFSv4 protocols. However, you must pay attention to the following limits:

- Attributes not supported by NFSv4.0 include: FATTR4_MIMETYPE, FATTR4_QUOTA_AVAIL_HARD, FATTR4_QUOTA_AVAIL_SOFT, FATTR4_QUOTA_USED, FATTR4_TIME_BACKUP, and FATTR4_TIME_CREATE. If these attributes are attempted, an NFS4ERR_ATTRNOTSUPP error is returned to the client.
- Attributes not supported by NFSv4.1 include: FATTR4_DIR_NOTIF_DELAY, FATTR4_DIRENT_NOTIF_DELAY, FATTR4_DACL, FATTR4_SACL, FATTR4_CHANGE_POLICY, FATTR4_FS_STATUS, FATTR4_LAYOUT_HINT, FATTR4_LAYOUT_TYPES, FATTR4_LAYOUT_ALIGNMENT, FATTR4_FS_LOCATIONS_INFO, FATTR4_MDSTHRESHOLD, FATTR4_RETENTION_GET, FATTR4_RETENTION_SET, FATTR4_RETENTEVT_GET, FATTR4_RETENTEVT_SET, FATTR4_RETENTION_HOLD, FATTR4_MODE_SET_MASKED, and FATTR4_FS_CHARSET_CAP. If these attributes are attempted, an NFS4ERR_ATTRNOTSUPP error is returned to the client.
- OPs not supported by NFSv4.1 include: OP_DELEGPURGE, OP_DELEGRETURN, and NFS4_OP_OPENATTR. If these OPs are attempted, an NFS4ERR_NOTSUPP error is returned to the client.
- NFSv4 currently does not support Delegation.
- Issues concerning UID and GID
  - For the NFSv3 protocol, if the file’s UID or GID exists in a Linux local account, then the corresponding user name or group name is displayed based on the mapping relations of the local UID and GID; if the file’s UID or GID does not exist in the local account, then the UID or GID is displayed directly.
  - For the NFSv4 protocol, if the version of the local Linux kernel is earlier than 3.0, the UID and GID of all files is displayed as nobody; if the version is later than 3.0, then the display rule is the same as that of NFSv3 protocol.

Note:

If you use NFSv4 protocol to mount a file system, and the version of your Linux kernel is earlier than 3.0, we recommend that you do not change owner or

group of the file or directory. Otherwise, the UID and GID of the file or directory is changed to nobody.

- A single file system can be simultaneously mounted and accessed by up to 10,000 computing nodes.

4 SMB protocol limits

NAS supports the SMB protocol. However, you must pay attention to some limits.

Introduction

Server Message Block (SMB), also known as Common Internet File System (CIFS), usually refers to SMB protocols earlier than SMB2. SMB is an application-layer communication protocol used to access files, printers, and other shared resources on networks. The SMB mentioned in NAS documentations refers to SMB 2.0 and later versions, which are supported by Alibaba Cloud NAS.

Compared to NFS, the SMB protocol is more suitable for Windows clients. Many versions of Windows provide excellent support for the SMB protocol, and most Windows applications can access Alibaba Cloud NAS through the SMB protocol without modification. We recommend that you use SMB as the file system on your Windows clients.

Features

SMB provides the following functions:

- It supports SMB 2.0 and later versions, with corresponding support for Windows Vista, Windows Server 2008, and all later versions of Windows, but does not support Windows XP, Windows Server 2003, and earlier versions. The main reason is that SMB 1.0, in comparison to SMB 2.0 and later versions, has major design differences and serious defects in performance and functions, and Microsoft no longer provides support for earlier versions of Windows and Windows that only supports SMB 1.0.
- The file system capacity and performance can be linearly scaled in a single namespace. The maximum capacity for a single file system is petabyte-sized data with up to one billion of files.
- SMB supports secure access control in VPCs and classic networks to protect the privacy of user data. SMB provides mount point permission groups and supports RAM for console access (RAM APIs).
- Access method: Each mount point provides only one share, all named *myshare* . You can use `\\ mount_poin t \ myshare` to access this SMB share.

Your multiple virtual hosts in an Alibaba Cloud classic or VPC network can simultaneously access the same SMB file system.

- The same as the NFS, SMB is based on the same distributed and highly-available underlying file system, so it provides the same SLA. The restrictions on file quantities and lengths are also the same as those in NFS.

Limits

Public cloud environments and traditional enterprise environments are different , especially in diversity and complexity of clients. A few SMB functions are not supported. These unsupported functions have no effect on the operation of most applications. The following functions are unsupported:

- Access by Linux clients
- Access to the same file system from both NFS and SMB, or direct access to an SMB file system over a WAN
- File and directory ACLs (file system ACLs are supported)
- File extended attributes and Oplocks and Lease-based client caching
- Sparse files, file compression, NIC status queries, reparse points, and other IOCTL/ FSCTL operations
- Alternate data streams
- SMB Direct, SMB Multichannel, SMB Directory Leasing, Persistent File Handle, and other protocol functions provided by SMB 3.0 and later versions