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Apsara File Storage NAS

Storage types

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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.General-purpose NAS file systems

General-purpose NAS file systems are used to store hot data that is frequently accessed. General-purpose NAS file systems consist of NAS Performance file systems and NAS Capacity file systems. This topic compares the performance metrics, supported protocols, advanced features, and scenarios of NAS Capacity file systems and NAS Performance file systems. You can select the type of General-purpose NAS file systems based on your business requirements.

Item	NAS Capacity	NAS Performance
Peak Bandwidth	The minimum bandwidth is 150 MB/s. The bandwidth increases by 0.15 MB/s per GiB. The maximum bandwidth is 10 GB/s.	The minimum bandwidth is 600 MB/s. The bandwidth increases by 0.6 MB/s per GiB. The maximum bandwidth is 20 GB/s.
IOPS	The maximum IOPS is 15,000. For more information, see FAQ about performance of Apsara File Storage NAS.	The maximum IOPS is 30,000. For more information, see FAQ about performance of Apsara File Storage NAS.
Average latency of 4 KiB files	10 ms	2 ms
Capacity	0~10 PiB	0~1 PiB
Scaling step size	4 KiB	4 KiB
Scaling method	Auto scaling	Auto scaling
Supported protocols	• NFS v3 • NFS v4.0 • SMB	• NFS v3 • NFS v4.0 • SMB
Advanced features	• Perform access control based on RAM policies • Server-side encryption • Performance monitoring • Back up and restore files • Data migration • Lifecycle management • ACL	Performance NAS file systems support the same advanced features as Capacity NAS file systems.
Scenarios	Cost-sensitive workloads that require moderate latency, such as big data analysis, file sharing, and backup.	Random I/O intensive and latency-sensitive workloads, such as enterprise applications and containers.

2.IA storage media

If the data in a General-purpose NAS file system is not accessed for more than 14 days, you can enable the lifecycle management feature. Then, you can dump the data to an Infrequent Access (IA) storage medium to reduce costs. This topic describes the scenarios, benefits, and workflow of an IA storage medium.

Scenarios

- Web content management

  Most web content management systems are used to upload and download data. These management systems include WordPress, FTP, and Internet Information Services (IIS). In most cases, the backends of the content management systems are used to provide shared file storage. However, an increasing volume of data that is not often accessed may become cold data after a time range. An IA storage medium provides a cost-effective solution to store and manage cold data for web content management.

- Big data analysis

  An IA storage medium provides a cost-effective storage solution for large volumes of unstructured data, such as gene sequencing, GIS, bill image, and audio recording data. IA storage media also provide the same throughput as General-purpose NAS file systems.

- Backup storage

  If you use General-purpose NAS file systems as the backup media for databases such as MySQL, Redis, and MongoDB, IA storage media provide a cost-effective storage solution. You can also integrate General-purpose NAS file systems with Volume Shadow Copy Service (VSS) to back up Windows servers.

Benefits

- Easy configuration: You do not need to write scripts or manually migrate cold data.

  After you configure a lifecycle management policy for a directory, the files that meet the policy are automatically dumped from the directory to the IA storage medium. You do not need to manually perform complex or high-risk data migration.

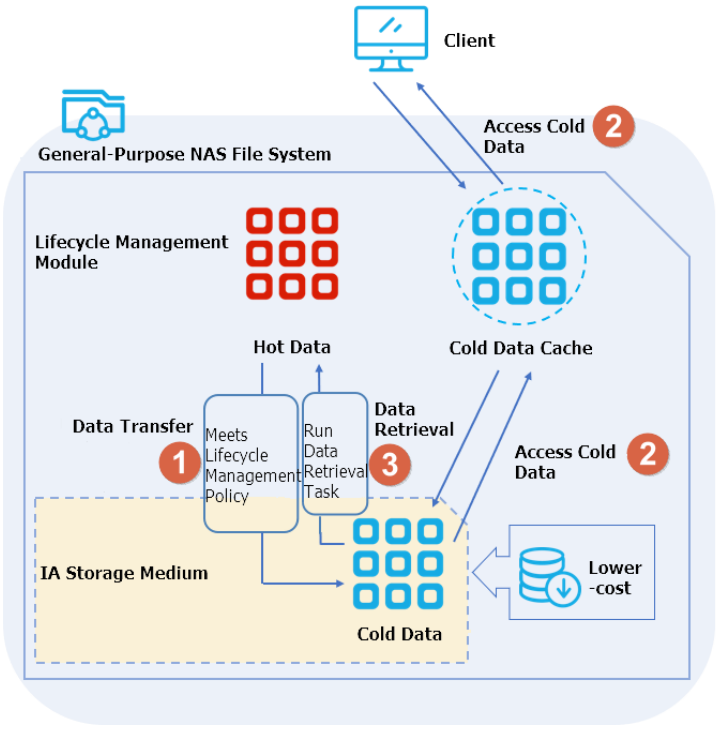
- Lower cost: You can dump files of cold data to an inexpensive storage medium.

  The file system automatically identifies cold data based on the lifecycle management policy and performs an immediate dump of the cold data. Compared with the method that is used to archive the data by directory, the lifecycle management feature dumps only cold data to minimize your overall costs.

- Instant access: You can access cold data without the need to modify the lifecycle management policy or manually migrate cold data from the IA storage medium to the file system.

  After cold data is dumped, the content and structure of the file system is unchanged. Applications can access the cold data as normal. Therefore, you do not need to modify applications or interrupt your business.

Workflow



The workflow of lifecycle management includes the following steps:

1. A lifecycle management policy is configured for a file system based on the access frequency of the data in the file system. For more information, see Manage a lifecycle management policy.
2. The lifecycle management module checks for cold data in the specified directory at regular intervals based on the lifecycle management policy. If cold data is identified, it is dumped from the General-purpose NAS file system to the IA storage medium (1 in the figure).
3. When you attempt to access the cold data, it is cached from the IA storage medium to the General-purpose NAS file system (2 in the figure). The latency for access to cold data for the first time is slightly higher than the latency for access to cold data for the second time. From the second time, the access latency is the same as the latency for access to the data stored in the General-purpose NAS file system. If you access the cold data in the IA storage medium, you are charged for the read/write traffic of the cold data. For more information, see Billing of IA storage media.
4. If you require frequent access to data in the IA storage medium, we recommend that you create a data retrieval task. This allows you to retrieve the specified file or cold data from the specified directory. Then, you can store the retrieved data in the storage space of the general-purpose NAS file system (3 in the figure). If you run a data retrieval task, you are charged for the write traffic of the cold data. For more information, see Create a data retrieval task and Billing of IA storage media.

3.Extreme NAS file systems

Extreme NAS is a high-performance file sharing service based on the latest network architecture and all-flash storage. The fully managed cloud storage service is integrated with the computing services of Alibaba Cloud to provide optimal computing performance for public cloud. This topic describes the performance metrics, supported protocols, advanced features, and scenarios of Extreme NAS file systems.

Item	Standard	Advanced
Bandwidth	The maximum bandwidth is 1,200 MB/s. The bandwidth varies with the storage capacity, as shown in the following list: • [100 GiB, 500 GiB): 150 MB/s • [500 GiB, 2 TiB): 300 MB/s • [2 TiB, 4 TiB): 600 MB/s • [4 TiB, 8 TiB): 900 MB/s • [8 TiB, 256 TiB): 1,200 MB/s	The maximum bandwidth is 1,200 MB/s. The bandwidth varies with the storage capacity, as shown in the following list: • [100 GiB, 500 GiB): 150 MB/s • [500 GiB, 2 TiB): 300 MB/s • [2 TiB, 4 TiB): 600 MB/s • [4 TiB, 8 TiB): 900 MB/s • [8 TiB, 256 TiB): 1,200 MB/s
IOPS	The input/output operations per second (IOPS) varies with the storage capacity. If the I/O is 4 KiB, you can use the following formulas to calculate the read and write IOPS: • Read IOPS = 7,000 + 30 × Capacity (GiB). The maximum IOPS is 200,000. • Write IOPS = 3,500 + 15 × Capacity (GiB). The maximum IOPS is 100,000.	The IOPS varies with the storage capacity. If the I/O size is 4 KiB, you can use the following formulas to calculate the read and write IOPS: • Read IOPS = 5,000 + 50 × Capacity (GiB). The maximum IOPS is 200,000. • Write IOPS = 2,500 + 25 × Capacity (GiB). The maximum IOPS is 100,000.
Average latency for reading 4 KiB files	1.2 ms	0.3 ms
Capacity	100 GiB~256 TiB	100 GiB~256 TiB
Scaling step size	1 GiB	1 GiB
Scaling method	Manual scaling	Manual scaling
Protocol type	NFS v3	NFS v3
Advanced features	• Perform access control based on RAM policies • Server-side encryption • Configure monitoring and alerting • Manage snapshots	The advanced edition of Extreme NAS file systems also supports the same advanced features.

Item	Standard	Advanced
Scenarios	High-performance web services and development and testing environments for continuous delivery and continuous deployment (CI/CD). **Note** • The advanced edition of Extreme NAS file systems is unavailable in some zones due to infrastructure constraints. In this case, you can select the standard edition instead. • We recommend that you create an Extreme NAS file system in the zone where your business data resides. • You cannot change the edition of an Extreme NAS file system from standard to advanced.	

Extreme NAS file systems have been upgraded since May 20, 2020. If your Extreme NAS file system was created before May 20, 2020, we recommend that you create another Extreme NAS file system and migrate data to the new file system. The following table describes the performance metrics, supported protocols, and advanced features of the Extreme NAS file systems that were created before May 20, 2020. For more information, see Migrate data.

Item	Standard	Advanced
Bandwidth	The bandwidth does not vary with the storage capacity. Minimum bandwidth: 0.15 GB/s. Maximum bandwidth: 0.3 GB/s.	The bandwidth does not vary with the storage capacity. Minimum bandwidth: 0.15 GB/s. Maximum bandwidth: 0.3 GB/s.
IOPS	The IOPS varies with the storage capacity. If the I/O size is 4 KiB, you can use the following formulas to calculate the read and write IOPS: • Read IOPS = 1,000 + 30 × Capacity (GiB). The maximum IOPS is 20,000. • Write IOPS = 1,000 + 30 × Capacity (GiB). The maximum IOPS is 10,000.	The IOPS varies with the storage capacity. If the I/O size is 4 KiB, you can use the following formulas to calculate the read and write IOPS: • Read IOPS = 1,000 + 50 × Capacity (GiB). The maximum IOPS is 45,000. • Write IOPS = 1,000 + 50 × Capacity (GiB). The maximum IOPS is 30,000.
Average latency for reading 4 KiB files	1.2 ms	0.3 ms
Maximum capacity	32 TiB	32 TiB
Minimum capacity	100 GiB	100 GiB
Scaling step size	1 GiB	1 GiB

Item	Standard	Advanced
Scaling method	Manual scaling	Manual scaling
Protocol type	NFS v3	NFS v3
Advanced features	• Perform access control based on RAM policies • Server-side encryption • Configure monitoring and alerting • Manage snapshots	The advanced edition of Extreme NAS file systems also supports the same advanced features.