Scalable File Service

FAQs

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1 SFS Concepts

1.1 What Is SFS?

Scalable File Service (SFS) provides scalable, high-performance file storage. With SFS, you can enjoy shared file access spanning multiple ECSs. SFS supports the Network File System (NFS) protocol. You can seamlessly integrate existing applications and tools with the service.

SFS provides an easy-to-use graphical user interface (GUI). On the GUI, users can create and configure general-purpose file systems, saving effort in deploying, expanding, and optimizing file systems.

In addition, SFS features high reliability and availability. It can be elastically expanded and performs better as its capacity grows. SFS is suitable for a wide range of scenarios, including media processing, file sharing, content management and web services, big data, and analytic applications.

1.2 What Are the Differences Between SFS, OBS, and EVS?

Table 1-1 shows the comparison between SFS, OBS, and EVS.

Table 1-1 Comparison between SFS, OBS, and EVS

Dimension	SFS	OBS	EVS
Concept	SFS provides on-demand high-performance file storage, which can be shared by multiple cloud servers. SFS is similar to a remote directory for Linux OSs.	OBS provides massive, secure, reliable, and cost-effective data storage for users to store data of any type and size.	EVS provides scalable, high-performance, high-reliability, block storage that can be used to meet a wide variety of service requirements. EVS disks are like physical disks on PCs.
Data storage logic	Stores files. Data is sorted and displayed in files and folders.	Stores objects. Files are saved directly to OBS. The files automatically generate corresponding system metadata. You can also customize the metadata if needed.	Stores binary data and cannot directly store files. To store files, you need to format the disk with a file system first.
Access method	SFS file systems need to be mounted to ECSs or BMSs through the NFS protocol before they can be accessed. A network address must be specified or mapped to a local directory for access.	OBS buckets can be accessed through the Internet or Direct Connect. The bucket address must be specified for access, and transfer protocols HTTP and HTTPS are used.	EVS disks can only be used and accessed from applications after being attached to ECSs or BMSs and initialized.

Dimension	SFS	OBS	EVS
Use cases	Media processing, file sharing, high-performance computing, and data backup **NOTE** Mainly suitable for high-performance computing workloads like gene sequencing and image rendering that require high bandwidth for file sharing.	Big data analysis, static website hosting, online video on demand (VoD), gene sequencing, and intelligent video surveillance	High-performance computing, enterprise critical clustered applications, enterprise application systems, and development and testing **NOTE** Mainly suitable for high-performance workloads like industrial design and energy exploration that require high speed and high IOPS for high-performance storage.
Capacity	EB-level	EB-level	TB-level
Latency	10 ms	10 ms	Sub-millisecond
IOPS/TPS	Millions	Tens of millions	128,000 per disk
Bandwidth	TB/s	TB/s	MB/s
Data sharing	Supported	Supported	Supported
Remote access	Supported	Supported	Not supported
Online editing	Supported	Not supported	Supported
Used independently	Supported	Supported	No (EVS disks can only be used after being attached to cloud servers, such as ECSs.)

1.3 What Access Protocols Does SFS Support?

General-purpose file systems support standard NFSv3.

2 SFS Specifications

2.1 What Is the Maximum Size of a File That Can Be Stored in a General-Purpose File System?

For general-purpose file systems, the maximum supported size of a file is 50 TB.

2.2 How Many General-Purpose File Systems Can I Create with One Account?

You can create a maximum of 100 general-purpose file systems with one account.

3 SFS Billing

3.1 How Do I Purchase SFS?

SFS uses pay-per-use billing by default. You are billed by the storage space used and the duration of use. You can also plan the storage capacity and for how long you want to use it and buy resource packages. Pay your outstanding amount in a timely manner to prevent your general-purpose file system from being deleted.

📖 **NOTE**

The size of a resource package is irrelevant to the compute throughput of general-purpose file systems.

Buying a Pay-per-Use File System

Step 1 Sign up for an account.

1. Visit the **Huawei Cloud website**.
2. In the upper right corner of the page, click **Sign Up**.
3. Complete the registration as instructed.

Step 2 Add a credit card.

For details about how to add a payment method, see **Adding a Payment Method**. For details about how to pay, see **Payment**.

Step 3 Use SFS.

1. **Log in to the SFS console**.
2. Click **Create File System** to create a file system and then use it.

----End

Buying a Resource Package

You can buy General-Purpose File System resource packages by clicking **Buy Storage Package**. Resource packages cannot be used across regions. Check your region before buying a resource package.

Procedure

Step 1 Buy resource packages.

1. In the upper right corner of the SFS console, click **Buy Storage Package**.

2. On the displayed page, configure the parameters.

   You can view the pricing standards on **Product Pricing Details**.

3. Click **Next**.

4. Confirm the order information and click **Submit**.

   To modify the order information, click **Previous** and then continue with your purchase.

5. Pay for the order.

6. Go back to the SFS console.

   Resource packages cannot be viewed on the SFS console. To view the resource packages, see **How Do I Check the Usage of My Resource Package?**

   ☐ NOTE

   - A General-Purpose File System resource package can be used immediately after payment. If the package capacity is greater than the used capacity of general-purpose file systems, pay-per-use billing stops immediately. The package capacity is preferentially used when you use general-purpose file systems.

   - General-Purpose File System resource packages cannot be expanded, but can be purchased multiple times. For details, see **Can I Purchase Resource Packages When I Still Have Valid Ones in Use?**

     Assume that you purchased a 1 TB General-Purpose File System resource package for a year, created a general-purpose file system, and used 500 GB, the used capacity of the resource package is 500 GB. For how to view the resource package usage, see **How Do I Check the Usage of My Resource Package?** One month later, you created another general-purpose file system and used 600 GB storage. At that time, the purchased 1 TB package capacity was used up, and the usage exceeding the package (76 GB) would be billed on a pay-per-use basis. If you do not want to be billed pay per use, you can purchase more resource packages. For details, see **Buying a Resource Package**.

Step 2 Use SFS.

1. **Log in to the SFS console**.

2. Click **Create File System**. The package capacity is automatically used. You do not need to associate general-purpose file systems to the resource package. If you have multiple file systems in the region of the resource package, they can share the same package.

   ----End

3.2 How Do I Renew SFS?

Your account may be frozen or order be canceled if outstanding bills are not paid in time.

Procedure

Step 1 **Access the Renewals page**.

Step 2 Find the desired resource and click **Renew** in the **Operation** column.

Step 3 Pay for the order as prompted.

> 📖 **NOTE**
>
> - After the payment, the system automatically pays the arrears.
> - For more information about renewal, including auto-renewal, exporting the renewal list, and changing subscriptions, see **Renewals**.
> - For more information about orders, coupons, and expenditure details, see the **Top-Up and Payment**.

----End

3.3 How Do I Check If My Account Is in Arrears?

You can go to Billing Center and view arrears. If your account is in arrears, the system processes resources and charges in SFS according to rules specified in **Resource Suspension and Release**. To prevent service suspension and resource release, repay the arrears in time.

Procedure

Step 1 **Log in to Billing Center**.

Step 2 On the **Overview** page, view the outstanding amount of the current account.

Step 3 Top up your account to pay the arrears if any.

----End

> 📖 **NOTE**
>
> - For details about how to add a credit card for automatic payment, see **Adding a Payment Method**.
> - For details about how to make a payment, see **Making Payments (Postpaid Direct Customers)**.
> - For more information about orders, coupons, and expenditure details, see the **Top-Up and Payment**.

3.4 Can I Purchase Resource Packages When I Still Have Valid Ones in Use?

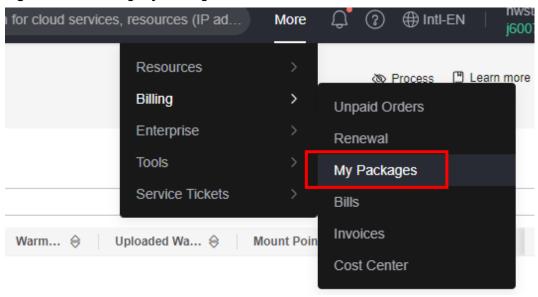Yes. You can buy resource packages on top of the valid ones, and older packages are preferentially used.

Assume that you had 1.2 TB of file data and you purchased a 1 TB resource package for one month on August 15 and another 1 TB package for one month on August 20. Then, from August 20 to September 15, the first 1 TB package was used up, and the second package was used 0.2 TB. If the first package was not renewed, the second package would be used up during the time from September 15 to September 20.

3.5 How Do I Check the Usage of My Resource Package?

Procedure

Step 1 **Log in to the SFS console**.

Step 2 Choose **Billing** > **My Packages**, as shown in **Figure 3-1**.

Figure 3-1 Selecting My Packages

Step 3 View the resource packages you purchased in the resource package list. Click the name or ID of a resource package to view the package usage.

----End

4 SFS Mount

4.1 What Can I Do If Data of My General-Purpose File System Is Not the Same When Accessed from Two Client Servers?

Symptom

A general-purpose file system was mounted to two servers. There was a delay in synchronizing files from one server to another. However, there was no delay when files were uploaded to a server.

Fault Diagnosis

Add **noac, lookupcache=none** to the mount command.

The **noac** option disables file attribute caching and forces write synchronization. By default, an NFS client's file attribute information is cached using the **ac** option to improve performance, and the client checks file attribute information periodically and updates it if there are any changes. Within the cache validity period, the client does not check whether file attribute information on the server is changed. By default, the value of this option is **ac**. Set it to **noac**.

The **lookupcache** option is related to directory entry caching, and the value can be **all**, **none**, **pos**, or **positive**. With **lookupcache=none**, the client neither trust the positive nor negative lookup results. In this way, lookup caching is disabled.

Solution

Step 1 Unmount the general-purpose file system if it has been mounted. For details, see **Unmounting a General-Purpose File System**.

Step 2 Complete the preparations before mounting the file system. For details, see **Mounting a General-Purpose File System to Linux ECSs**.

Step 3 Mount the general-purpose file system.

```
mount -t nfs -o vers=3,retrans=1,timeo=600,noresvport,nolock,proto=tcp <mount-point> <local-path>
```

----End

4.2 Does SFS Support Cross-Region Mounting?

General-purpose file systems cannot be mounted across regions.

4.3 Can I Mount a General-Purpose File System Across Accounts?

General-purpose file systems cannot be mounted across accounts.

4.4 How Many Cloud Servers Can I Mount a General-Purpose File System To?

You can mount a general-purpose file system to a maximum of 10,000 cloud servers.

4.5 Why 250TB Is Returned After I Mount My General-Purpose File System?

There is no limit on the capacity of a general-purpose file system. When you run **df -h** on a client, the system returns **250TB** for display purposes. This value is meaningless, and the available capacity is not limited.

4.6 How Do I Mount a General-Purpose File System to a Linux ECS as a Non-root User?

Scenarios

By default, a Linux ECS only allows **root** to mount general-purpose file systems using the **mount** command, but you can grant the permissions of **root** to other users. Such users can then mount the file systems using the **mount** command.

The following describes how to grant the permissions of **root** to a non-root user and mount a general-purpose file system to a Linux ECS as the non-root user. EulerOS is used in this example.

Mounting a File System as a Non-root User

Step 1 **Log in the ECS** as user **root**.

Step 2 Assign the permissions of **root** to a non-root user.

1. Run **chmod 777 /etc/sudoers** to make the **sudoers** file editable.

2. Use the **which** command to view the **mount** and **umount** command paths.

Figure 4-1 Viewing command paths

3. Run **vi /etc/sudoers** to edit the **sudoers** file.
4. Add a user under **root**. In this example, user **mike** is added.

Figure 4-2 Adding a user

5. Press **Esc**, enter **:wq**, and press **Enter** to save and exit.
6. Run **chmod 440 /etc/sudoers** to make the **sudoers** file read-only.

Step 3 Switch to the user **mike** and log in to the ECS.

Step 4 Mount the file system. **Table 4-1** describes the mount parameters.

sudo mount -t nfs -o vers=3,timeo=600,nolock *<mount-point> <local-path>*

Table 4-1 Parameter description

Parameter	Description
<mount-point>	The format is *<file-system-domain-name>:/<file-system-name>*, for example, *xxx:***/sfs-name-001**. **NOTE** Variable *x* is a digit or letter. If the mount point is too long to display completely, you can adjust the column width.
<local-path>	A local directory on the ECS used to mount the file system, for example, **/local_path**.

Step 5 View the mounted file system.

```
mount -l
```

If the command output contains the following information, the file system has been mounted:

```
example.com:/share-xxx on /local_path type nfs (rw,vers=3,timeo=600,nolock,addr=)
```

----End

4.7 What Can I Do If Mounting a Subdirectory of a File System Failed?

Troubleshooting

If a subdirectory is not created before mounting, the mount will fail.

Figure 4-3 Mounting without a subdirectory

In the preceding figure, the root directory does not have the **subdir** subdirectory created, so the mount fails. In this case, error message "Permission denied" is reported.

To troubleshoot this issue, mount the root directory, create a subdirectory, and then mount the subdirectory.

Figure 4-4 Mounting a subdirectory

5 SFS Access

5.1 Can I Mount a General-Purpose File System Across VPCs?

You can configure multiple VPCs for a general-purpose file system so that cloud servers in different VPCs can share the same file system, as long as the VPCs are added as authorized VPCs of the file system or the server IP addresses are added as authorized IP addresses of the VPC. For details, see **Configuring Multi-VPC Access**.

5.2 Can I Directly Access SFS from On Premises?

General-Purpose File System supports on-premises access via IDC private lines. After network communication is established, you can access a general-purpose file system from your on-premises devices.

5.3 How Do I Handle a Service Failure Reported During a Listing Operation in a General-Purpose File System?

Symptom

Both client A and client B mount the same directory of an NFS general-purpose file system. When client A performs a listing operation for this directory, client B deletes some files or directories from the same directory at the same time, and then client A receives a service failure (Unknown error 523).

Possible Cause

NFS lists directory contents with chunks and uses a cookie to keep track of where the client is in a directory listing. During a listing, if the cookie required in the next chunk is deleted by a concurrent operation, the server side returns **NFS3ERR_BAD_COOKIE**, and the NFS client retries. If the preceding scenario occurs after several retries, a client-side error is reported.

Solution

When listing a directory of an NFS general-purpose file system, avoid creating or deleting files or directories in that directory at the same time. For details, see **NFS Version 3 Protocol Specification**.

6 SFS Deletion

6.1 How Do I Delete .nfs Files?

NFS .nfs Files

The .nfs files are temporary files in NFS. If you try to delete a file, and the file is still open, an .nfs file will appear. The .nfs files are used by NFS clients to manage the deletion of open files in the file system. If one process deletes a file while another process still has it open, the client will rename the file to .nfsxxx. If the last open to this file is closed, the client will automatically delete the file. If the client crashes before the file is cleared, the file will be left in the general-purpose file system.

Clearing .nfs Files

The .nfs files need to be cleared. You can run **rm -f** to delete them. The general-purpose file system will not be affected by the deletion. If an error is reported when you delete an .nfs file, do as follows:

Figure 6-1 Deletion error

```
$ rm -f .nfs0000000001f0df8c0000XXXX

rm: cannot remove `smkit/SM_DOMAIN/.nfs0000000001f0df8c0000XXXX': Device or resource busy
```

Run **lsof** to obtain the ID of the process that has the file open.

Figure 6-2 Viewing the process ID

```
$ lsof .nfs0000000001f0df8c0000XXXX

COMMAND   PID    USER   FD   TYPE DEVICE SIZE/OFF    NODE NAME

java    25887 <UID> mem    REG   0,22   98117 32545366 .nfs0000000001f09a560000XXXX
```

If the process can be stopped, run **kill -9** *<process-ID>* to stop the process and then delete the file.

7 SFS Migration

7.1 How Can I Migrate Data Between SFS and EVS?

Mount a general-purpose file system and attach an EVS disk to the same ECS, and then manually replicate data between the file system and disk.

8 Others

8.1 Does the Security Group of a VPC Affect the Use of SFS?

A security group is a collection of access control rules for ECSs that have the same security protection requirements and are mutually trusted in a VPC. After a security group is created, you can create different access rules for the security group to protect the ECSs that are added to this security group. The default security group rule allows all outgoing data packets. ECSs in a security group can communicate with each other without the need to add rules. The system creates a security group for each cloud account by default. You can also create custom security groups by yourself.

For a general-purpose file system, you need to add inbound and outbound rules for the security group. For details, see **Adding a Security Group Rule**. The inbound ports required by NFS are ports 111, 2049, and 2050.

Example Configuration

- Inbound rule

Direction	Protocol	Port Range	Source IP Address		Description
Inbound	TCP	111	IP Address	0.0.0.0/0 (All IP addresses are allowed. It can be modified.)	One port corresponds to one access rule. You need to add rules for the ports one by one.

- Outbound rule

Directio n	Protoc ol	Port Range	Source IP Address		Description
Outbou nd	TCP	111	IP Addres s	0.0.0. 0/0 (All IP addre sses are allow ed. It can be modif ied.)	One port corresponds to one access rule. You need to add rules for the ports one by one.

☐ **NOTE**

Enter an IP address range using a mask. For example, enter **192.168.1.0/24**, and do not enter **192.168.1.0-192.168.1.255**. If the source IP address is 0.0.0.0/0, all IP addresses are allowed. For more information, see **Security Groups and Security Group Rule Overview**.

A bidirectional access rule must be configured for port 111. The inbound rule can be set to the frontend service IP address range of SFS. You can obtain the IP address range by running **ping** *Domain name or IP address of the general-purpose file system* or **dig** *Domain name or IP address of the general-purpose file system*.

For ports 2049 (TCP) and 2050 (TCP), outbound rules need to be added, which are the same as the outbound rule of port 111.

8.2 What Resources Does SFS Occupy?

To ensure that general-purpose file systems can be used properly, SFS occupies the following resources:

When a general-purpose file system is created, the inbound rules for ports 111, 2049, and 2050 are created in the security group you selected. The source IP address defaults to 0.0.0.0/0 in all rules. You can change the IP address as required.

Writing data to a general-purpose file system consumes the running memory of the server, but does not occupy the server's disk space. The file system uses independent space.

8.3 Can a File System Be Accessed Across Multiple AZs?

1. A single general-purpose file system can only be created in one AZ, but can be mounted to and accessed from any AZ.

2. A general-purpose file system does not support cross-AZ data redundancy. If the AZ is unavailable, the general-purpose file system becomes unavailable accordingly.