Object Storage Service

User Guide

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HUAWEI

HUAWEI CLOUD COMPUTING TECHNOLOGIES CO., LTD.

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1 Accessing OBS

OBS Domain Name

The following two concepts are related to OBS domain names:

1. **Endpoint:** OBS provides an endpoint for each region. An endpoint is a domain name to access OBS in a certain region and is used to receive access requests sent from that region. For the mapping between regions and OBS endpoints, see **Regions and Endpoints**.
2. **Bucket domain name**: Each bucket in OBS has a domain name. A domain name is the Internet address of a bucket and can be used to access the bucket over the Internet. It is typically used in cloud application development and data sharing scenarios.

   An OBS bucket domain name is in the *BucketName*.*Endpoint* format.

   BucketName indicates the name of a bucket, and *Endpoint* indicates the OBS domain name of the region where the bucket is located.

Table 1-1 lists the bucket domain name and other domain names of OBS, including their formats and protocols.

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Table 1-1 OBS domain names

Type		Structure	Description	Protocol Type
User-defined domain name (recommended)	**User-defined domain name**	Domain names that you have registered and have been licensed by the Ministry of Industry and Information Technology (MIIT)	You can configure a user-defined domain name for a bucket so that you can use the domain name to access the bucket.	HTTPS HTTP

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Type		Structure	Description	Protocol Type
Huawei Cloud OBS domain name	Region-specific domain name (public domain name)	[Structure] *Endpoint* [Example] obs.ap-southeast-1.myhuaweicloud.com	Each region has an OBS endpoint, which is the OBS service domain name of the region. For the mapping between regions and OBS endpoints, see **Regions and Endpoints**.	HTTPS HTTP
	Bucket domain name	[Structure] *BucketName.Endpoint* [Example] bucketname.obs.ap-southeast-1.myhuaweicloud.com	After a bucket is created, you can access it using its domain name. You can build the bucket domain name according to its structure, or you can obtain it from **the bucket's basic information** on **OBS Console** or OBS Browser+.	HTTPS HTTP
	Object domain name	[Structure] *BucketName.Endpoint/ObjectName* [Example] bucketname.obs.ap-southeast-1.myhuaweicloud.com/object.txt	After an object is uploaded to a bucket, you can access the object using its domain name. You can build the object domain name according to its structure, or obtain it from **the object details** on **OBS Console** or OBS Browser+. You can also use an SDK to call the GetObjectUrl API to obtain the object domain name.	HTTPS HTTP
	Static website domain name	[Structure] *BucketName*.**obs-website.***Endpoint* [Example]	A static website domain name is a bucket domain name when the bucket is	HTTPS HTTP

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Type		Structure	Description	Protocol Type
NOTE To protect your services from being affected by the takeover of Huawei Cloud public domain names by relevant organizations, you are advised to use a user-defined do		bucketname.obs-website.ap-southeast-1.myhuaweicloud.com	configured to host a static website.	

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Endpoints

Generally, the endpoint carried in a request for accessing OBS must be the endpoint of the region where the requested resource resides. However, in some special cases, you can use any endpoint.

1. **Scenarios where the endpoint in a request must be the endpoint of the region where the requested resources reside**

   When accessing a bucket or an object, the endpoint in the request must be the endpoint of the region where the bucket or object resides.

   For example, if bucket **mybucket** is in region **ap-southeast-1**, you can list objects in the bucket by sending a request shown in the following example:

   A correct example of request and response for listing objects:

   [Request]

   ```
   GET / HTTP/1.1
   Host: mybucket.obs.ap-southeast-1.myhuaweicloud.com
   Accept: */*
   Date: Thu, 10 Mar 2016 08:51:25 GMT
   Authorization: authorization
   ```

   [Response]

   ```
   HTTP/1.1 200 OK
   x-obs-request-id: 0001EF710C000001536176DA465E4E6G
   x-obs-id-2: Rdj0zZvRkihRcjcQUqjkDGt8JuAgi2CGuLiP7Pv/cYYplsS0xTFJQHP5vSg5yOYC
   Content-Type: application/xml
   Date: Thu, 10 Mar 2016 16:58:12 GMT
   x-obs-bucket-location: ap-southeast-1
   Content-Length: 259

   <?xml version="1.0" encoding="UTF-8" standalone="yes"?>
   <ListBucketResult xmlns="http://obs.myhuaweicloud.com/doc/2015-06-30/">
     <Name>mybucket</Name>
     <Prefix/>
     <Marker/>
     <MaxKeys>1000</MaxKeys>
     <IsTruncated>false</IsTruncated>
     <Contents>
       <Key>object001</Key>
       <LastModified>2015-07-01T00:32:16.482Z</LastModified>
       <ETag>"2fa3bcaaec668adc5da177e67a122d7c"</ETag>
       <Size>12041</Size>
       <Owner>
         <ID>b4bf1b36d9ca43d984fbcb9491b6fce9</ID>
       </Owner>
       <StorageClass>STANDARD</StorageClass>
     </Contents>
   </ListBucketResult>
   ```

   If the endpoint in the request is not consistent with the endpoint of the requested region, an error message is returned indicating that the bucket does not exist.

   In the example above, bucket **mybucket** is in region **ap-southeast-1**. If you use the endpoint of **cn-south-1** (**mybucket.obs.cn-south-1.myhuaweicloud.com**) to access the bucket, HTTP 404 is returned, indicating that the bucket does not exist. In this case, you can **make an API call to obtain the bucket's region ID**, and then send the request again.

   An incorrect example of request and response for listing objects:

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[Request]

```
GET / HTTP/1.1
Host: mybucket.obs.cn-south-1.myhuaweicloud.com
Accept: */*
Date: Thu, 10 Mar 2016 08:51:25 GMT
Authorization: authorization
```

[Response]

```
HTTP/1.1 404 NoSuchBucket
x-obs-request-id: 0001EF710C000001536176DA465E4E6H
x-obs-id-2: Rdj0zZvRkihRcjcQUqjkDGt8JuAgi2CGuLiP7Pv/cYYplsS0xTFJQHP5vSg5yOYL
Date: Thu, 10 Mar 2016 08:51:30 GMT
Content-Length: 0
```

2. **Scenarios where any endpoint can be used in a request**

   You can use the endpoint of any region in the API requests for listing buckets and for obtaining a bucket's region information, because these two APIs search for buckets from all regions.

   An example of request and response for obtaining a bucket's region information:

   For example, if bucket **mybucket** is in region **ap-southeast-1** and the endpoint of the **cn-south-1** region is used in the request, the bucket location information can still be obtained.

   [Request]

   ```
   GET /?location HTTP/1.1
   Host: mybucket.obs.cn-south-1.myhuaweicloud.com
   Accept: */*
   Date: Thu, 10 Mar 2016 08:51:25 GMT
   Authorization: authorization
   ```

   [Response]

   ```
   HTTP/1.1 200 OK
   x-obs-request-id: 0001EF710C000001536176DA465E4E6G
   x-obs-id-2: Rdj0zZvRkihRcjcQUqjkDGt8JuAgi2CGuLiP7Pv/cYYplsS0xTFJQHP5vSg5yOYC
   Content-Type: application/xml
   Date: Thu, 10 Mar 2016 16:58:12 GMT
   Content-Length: length

   <?xml version="1.0" encoding="UTF-8" standalone="yes"?>
   <Location xmlns="http://obs.myhuaweicloud.com/doc/2015-06-30/">ap-southeast-1</Location>
   ```

Accessing OBS over the Internet

Accessing OBS over a public network may generate inbound traffic for write operations (for example, uploading data to OBS), as well as outbound traffic for read operations (for example, downloading data from OBS). Inbound traffic does not incur fees, but outbound traffic does.

For details about the pricing of outbound traffic over the Internet, see **Product Pricing Details**.

If you access OBS over a public network, you can use a URL to specify resources in OBS. An OBS URL is structured as follows:

Protocol://[BucketName.]Endpoint[:Port][/Object][?Param]

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Table 1-2 Parameters in an OBS URL

Parameter	Description	Mandatory or Optional
Protocol	The protocol used for sending requests, which can be either HTTP or HTTPS. HTTPS is a protocol that ensures secure access to resources. OBS supports both HTTP and HTTPS.	Mandatory
BucketName	Name of the requested bucket, which uniquely identifies a bucket in OBS.	Optional
Endpoint	Domain name (endpoint) of the region where the OBS bucket is located. For the mapping between regions and OBS endpoints, see **Regions and Endpoints**.	Mandatory
Port	The port enabled for protocols used for sending requests. The value varies depending on software server deployment. If no port number is specified, the protocol uses the default value. Each transmission protocol has its default port number. In OBS, the default HTTP port number is **80** and that of HTTPS is **443**.	Optional
Object	Path of the requested object resource.	Optional
Param	Specific resource contained by a bucket or object. The default value of this parameter indicates that the bucket or object itself is obtained.	Optional

Example: You have a bucket named **mybucket** in the CN-Hong Kong (**ap-southeast-1**) region. The bucket contains an object named **myfolder/myfile.txt**. The URL for accessing the object over the public network is as follows:

https://mybucket.obs.ap-southeast-1.myhuaweicloud.com/myfolder/myfile.txt

NOTE

All API requests except the one for listing buckets must contain the **BucketName**. In consideration of the DNS resolution performance and reliability, OBS requires that the bucket name must precede the **Endpoint** when a request carrying a bucket name is constructed to form a three-level domain name, also mentioned as virtual hosting access domain name.

Accessing OBS over the Intranet

Accessing OBS over a private network refers to accessing OBS through the internal communication network between different services. Inbound traffic generated by accessing OBS over an intranet (write operations like uploading data to OBS) and

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outbound traffic (read operations like downloading data from OBS) are free of charge.

For example, you can access OBS from an Elastic Cloud Server (ECS) over a private network. Such access is not susceptible to public network quality issues, and it also reduces costs.

OBS provides you with a best practice for configuring such access. For details, see **Accessing OBS from an ECS over the Intranet**.

Checking OBS Version (OBS 2.0 or OBS 3.0)

OBS architecture has evolved for two generations, OBS 2.0 and OBS 3.0. A newly created bucket is stored in OBS 3.0 by default, and the bucket version is OBS 3.0. However, previously created buckets are still in OBS 2.0.

Basic OBS features and functions are supported by both OBS 3.0 and OBS 2.0. However, some new features, such as cross-region replication, image processing, are supported only by OBS 3.0.

You can check the bucket version on OBS Console or use the **Head Bucket** API to check whether your bucket is in OBS 2.0 or OBS 3.0. The details are as follows:

Method 1: Log in to OBS Console and check the basic bucket information.

If **Bucket Version** is **3.0**, the bucket is stored in OBS 3.0. If not, the bucket is stored in OBS 2.0.

Method 2: Use the Head Bucket API to check the bucket version.

Sample Request:

```
HEAD / HTTP/1.1
Host: bucketname.obs.ap-southeast-1.myhuaweicloud.com
Accept: */*
Date: WED, 01 Jul 2015 02:23:25 GMT
Authorization: auth string
```

Sample Response:

```
HTTP/1.1 200 OK
Server: OBS
x-obs-request-id: BF2600000163D80E4C5F20FDD5BD0085
Content-Type: application/xml
x-obs-version: 3.0
x-obs-id-2: 32AAAQAAEAABAAAQAAEAABAAAQAAEAABCS8wS9l00ll4oMWmdniV7XmdAvfewrQq
Date: WED, 01 Jul 2015 02:23:25 GMT
Content-Length: 0
```

In the response message, **x-obs-version: 3.0** indicates that the bucket is stored in OBS 3.0. If this header does not exist or the value of this header is displayed otherwise, the bucket is stored in OBS 2.0.

For details about the **Head Bucket** API, see **Obtaining Bucket Metadata**.

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2 Storage Class

2.1 Overview

Scenarios

As Internet develops, data storage scenarios become increasingly diverse. Limited storage classes cannot meet diverse storage and cost management requirements. OBS provides the following storage classes: Standard, Infrequent Access, Deep Archive (under a beta test), and Archive. For more information about billing for different storage classes, see **Storage Space**.

Storage Classes

OBS supports the following storage classes:

Standard

- Scenarios: The Standard storage class features low latency and high throughput. It is therefore good for storing frequently (multiple times a month) accessed files or small files (less than 1 MB). Its application scenarios include big data analytics, mobile apps, hot videos, and social apps.
- Redundancy: The Standard storage class provides two redundancy options. Multi-AZ storage means data is stored in multiple AZs, which enables more reliability. Single-AZ storage means data is stored in a single AZ, which is more cost-effective.
- Specifications: The minimum billable object size is 64 KB. There are no requirements for the minimum storage duration.

  Objects smaller than 64 KB are billed as 64 KB.

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NOTE

- The minimum billable object size refers to the minimum object size that is eligible for billing. For example, a 32 KB Standard object will be billed as if it were 64 KB.
- The minimum storage duration refers to the least time that is eligible for billing. This means that objects will be billed for the minimum storage duration even if they are not stored for that long. For example, if an Infrequent Access object is deleted after being stored in OBS for 20 days, it will be billed for the storage of 30 days (the minimum storage duration).

- Data restoration: N/A

NOTE

To access objects in the Archive or Deep Archive storage class, including reading or downloading them, accessing them with a URL, or configuring an ACL for them, you must first restore them. For more information, see **Restoring Archive or Deep Archive Objects**.

Infrequent Access

- Scenarios: The Infrequent Access storage class is for storing data that is infrequently (less than 12 times a year) accessed, but when needed, the access has to be fast. It can be used for file synchronization, file sharing, enterprise backups, and many other scenarios.
- Redundancy: The Infrequent Access storage class provides two redundancy options. Multi-AZ storage means data is stored in multiple AZs, which enables more reliability. Single-AZ storage means data is stored in a single AZ, which is more cost-effective.
- Specifications: The minimum billable object size is 64 KB. The minimum storage duration is 30 days.

  Objects smaller than 64 KB are billed as 64 KB. Objects stored for less than 30 days are billed for a full 30 days.

  NOTE

  - The minimum billable object size refers to the minimum object size that is eligible for billing. For example, a 32 KB Standard object will be billed as if it were 64 KB.
  - The minimum storage duration refers to the least time that is eligible for billing. This means that objects will be billed for the minimum storage duration even if they are not stored for that long. For example, if an Infrequent Access object is deleted after being stored in OBS for 20 days, it will be billed for the storage of 30 days (the minimum storage duration).

- Data restoration: The system automatically restores data, which generates **data restoration costs**.

  NOTE

  - To access objects in the Archive or Deep Archive storage class, including reading or downloading them, accessing them with a URL, or configuring an ACL for them, you must first restore them. For more information, see **Restoring Archive or Deep Archive Objects**.

Archive

- Scenarios: The Archive storage class is ideal for storing data that is rarely (once a year) accessed. Its application scenarios include data archiving and long-term backups. This storage class is secure, durable, and inexpensive, so it

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is often used to replace tape libraries. To keep cost low, it may take up to hours to restore data from this storage class.

- Redundancy: The Archive storage class only supports single-AZ redundancy. Data is stored in a single AZ, which is more cost-effective.
- Specifications: The minimum billable object size is 64 KB. The minimum storage duration is 90 days.

  Objects smaller than 64 KB are billed as 64 KB. Objects stored for less than 90 days are billed for a full 90 days.

  NOTE

  - The minimum billable object size refers to the minimum object size that is eligible for billing. For example, a 32 KB Standard object will be billed as if it were 64 KB.
  - The minimum storage duration refers to the least time that is eligible for billing. This means that objects will be billed for the minimum storage duration even if they are not stored for that long. For example, if an Archive object is deleted after being stored in OBS for 80 days, it will be billed for the storage of 90 days.
- Data restoration: Archive objects can be accessed only after being restored. The Archive storage class supports standard and expedited restoration. The standard restoration takes 3 to 5 hours, and the expedited restoration takes 1 to 5 minutes. You can enable **Direct Reading** to access Archive objects without restoring them first. Direct reading is billable, so only enable it if necessary.

  NOTE

  To access objects in the Archive or Deep Archive storage class, including reading or downloading them, accessing them with a URL, or configuring an ACL for them, you must first restore them. For more information, see **Restoring Archive or Deep Archive Objects**.

Deep Archive (Under Limited Beta Testing)

- Scenarios: The Deep Archive storage class is suitable for storing data that is barely (once every few years) accessed. This storage class costs less than the Archive storage class, but takes longer time (usually several hours) to restore data.
- Redundancy: The Deep Archive storage class only supports single-AZ redundancy. Data is stored in a single AZ, which is more cost-effective.
- Specifications: The minimum billable object size is 64 KB. The minimum storage duration is 180 days.

  NOTE

  - The minimum billable object size refers to the minimum object size that is eligible for billing. For example, a 32 KB Standard object will be billed as if it were 64 KB.
  - The minimum storage duration refers to the least time that is eligible for billing. This means that objects will be billed for the minimum storage duration even if they are not stored for that long. For example, if a Deep Archive object is deleted after being stored in OBS for 170 days, it will be billed for the storage of 180 days.
- Data restoration: Deep Archive objects can be accessed only after being restored. The Deep Archive storage class supports standard and expedited restoration. The standard restoration takes 5 to 12 hours, and the expedited restoration takes 3 to 5 hours.

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NOTE

To access objects in the Archive or Deep Archive storage class, including reading or downloading them, accessing them with a URL, or configuring an ACL for them, you must first restore them. For more information, see **Restoring Archive or Deep Archive Objects**.

Comparison of Storage Classes

Item	Standard	Infrequent Access	Archive	Deep Archive (Under Limited Beta Testing)
Feature	Top-notch performance, high reliability and availability	Reliable, inexpensive storage with real-time access	Long-term storage for archived data at a low cost	Long-term storage for Deep Archive data, with a lower unit price than Archive storage
Use cases	Cloud applications, data sharing, content sharing, and hot data storage	Web disk applications, enterprise backups, active archiving, and data monitoring	Storage of archives, medical imaging data, and videos, as well as replacement of tape libraries	Archive data that is barely accessed
Designed durability (single-AZ)	99.999999999% (11 nines)	99.999999999% (11 nines)	99.999999999% (11 nines)	99.999999999% (11 nines)
Designed durability (multi-AZ)	99.999999999% (12 nines)	99.999999999% (12 nines)	Not supported	Not supported
Designed availability (single-AZ)	99.99%	99%	99%	99%
Designed availability (multi-AZ)	99.995%	99.5%	Not supported	Not supported
Minimum billable object size	64 KB	64 KB	64 KB	64 KB
Minimum storage duration	N/A	30 days	90 days	180 days

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Item	Standard	Infrequent Access	Archive	Deep Archive (Under Limited Beta Testing)
Data access speed	Real-time access	Real-time access	• If direct reading is disabled, objects must be restored before you can access them. Standard restoration: 3 to 5 hours; Expedited restoration: 1 to 5 minutes. • If direct reading is enabled, objects can be accessed in real time.	Objects must be restored before you can access them. Standard restoration: 5 to 12 hours; Expedited restoration: 3 to 5 hours
Data restoration charges	N/A	Billed for each GB restored.	Billed for each GB restored. Pricing differs depending on standard or expedited restoration.	Billed for each GB restored. Pricing differs depending on standard or expedited restoration.
Image processing	Supported	Supported	Not supported	Not supported

2.2 Configuring a Storage Class

Scenarios

This section describes how to configure a storage class when you create a bucket or upload an object. If you want to change the storage class of an existing bucket or object, see **Changing the Storage Class of a Bucket or Object**.

Bucket and Object Storage Classes

When creating a bucket, you can specify a storage class for it. You can also change the storage class after the bucket has been created.

By default, an object inherits the storage class of the bucket where it is uploaded. You can specify a storage class for an object when uploading it, or you can change the object storage class after the object has been uploaded.

Changing the storage class of a bucket does not change the storage class of existing objects in the bucket. However, any new objects uploaded to the bucket will inherit the bucket's new storage class.

Configuring a Storage Class During Bucket Creation

You can use **OBS Console**, APIs, OBS SDKs, OBS Browser+, or obsutil to configure a storage class when creating a bucket.

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Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the upper right corner of the page, click **Create Bucket**.

Step 3 Configure parameters under **General Configuration**.

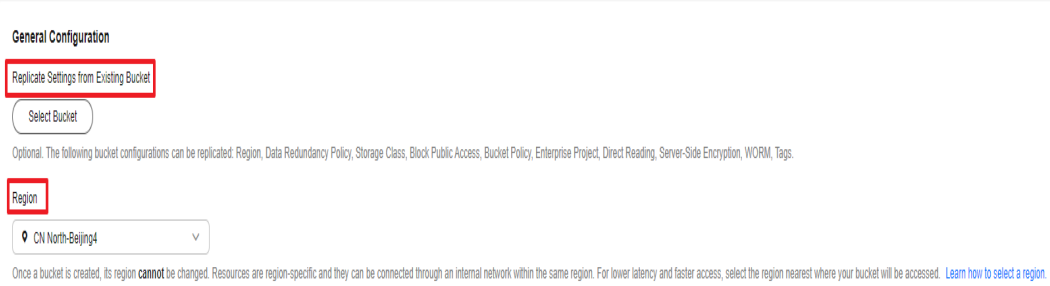

Table 2-1 Parameters under **General Configuration**

Parameter	Description
Replicate Settings from Existing Bucket	Optional If you want to reuse the settings of an existing bucket, do as follows to replicate the bucket's settings: Click **Select Bucket**. In the bucket list, select a source bucket. Then, on the **Create Bucket** page, you will see that the source bucket's settings have been replicated to the bucket you are creating. The settings that can be replicated include Region, Data Redundancy Policy, Storage Class, Block Public Access, Bucket Policy, Enterprise Project, Direct Reading, Server-Side Encryption, WORM, and Tag. You can change some or all of the replicated settings later if necessary.
Region	The region where the bucket is created • Once the bucket is created, its region **cannot be changed**. • For lower latency and faster access, select the region nearest to where the data will be accessed. • If your ECS needs to access an OBS bucket over an intranet, ensure that the bucket and the ECS are in the same region. For details, see **Accessing OBS from an ECS over an Intranet**.

Step 4 Configure parameters under **Bucket Settings**.

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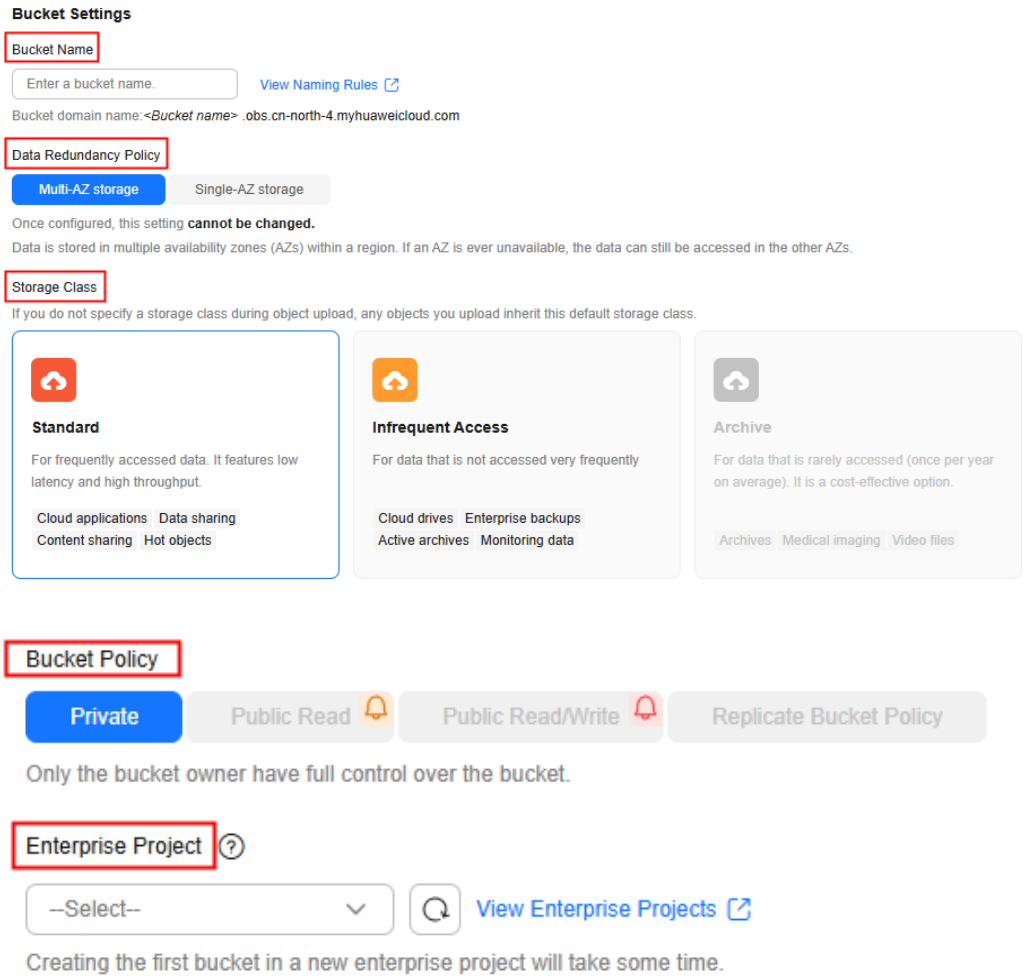

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Table 2-2 Parameters under **Bucket Settings**

Parameter	Description
Bucket Name	When creating a bucket, you need to set a proper bucket name. Once a bucket is created, its name **cannot be changed**. In accordance with the globally applied DNS naming rules, an OBS bucket name: • Must be unique. It cannot be the same as the name of any existing bucket or parallel file system (including those created by others). You must **wait at least 30 minutes before you can reuse the name** of a deleted bucket or parallel file system. • Must be 3 to 63 characters long. • Can contain only lowercase letters, digits, hyphens (-), and periods (.). It cannot start or end with a hyphen (-) or period (.). • Cannot contain two consecutive periods (..) or contain a period (.) and a hyphen (-) adjacent to each other. • Cannot be formatted as an IP address. **NOTE** When you use virtual-hosted-style URLs to access OBS over HTTPS, if the bucket name contains periods (.), the certificate verification will fail. To work around this issue, we recommend that you avoid using periods (.) in bucket names.
Data Redundancy Policy	You can choose to store data in a single AZ or multiple AZs within a region. • **Multi-AZ storage**: Data in the bucket is stored in multiple AZs within a region. If an AZ is ever unavailable, the data can still be accessed in the other AZs. • **Single-AZ storage**: Data in the bucket is stored in a single AZ. This option costs less than the multi-AZ storage. For details about their performance comparison, see **Comparison of Storage Classes**. **Multi-AZ storage** is selected by default. Once a bucket is created, its data redundancy policy **cannot be changed**. If **Multi-AZ storage** is used, the Archive or Deep Archive storage class will become unavailable.

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Parameter	Description
Storage Class	The storage class of the bucket You can choose a storage class that meets your needs for storage performance and costs. • The Standard storage class is for storing a large number of hot files or small files that are frequently accessed (multiple times per month on average) and require fast access. • The Infrequent Access storage class is for storing data that is less frequently accessed (less than 12 times per year on average), but when needed, the access has to be fast. • The Archive storage class is for archiving data that is rarely accessed (once a year on average) and does not require fast access. For more information, see **Storage Class**. **NOTE** The object you upload to the bucket later will inherit the bucket's storage class by default. You can also specify a different storage class for the object.
Block Public Access	Used to centrally set certain levels of public access to buckets. You can use this option to ignore the existing public access permissions or prevent new public access permissions from being created. Enabling all settings prevents the creation of new ACLs or bucket policies that contain public access, and invalidates existing ones. Only the bucket owner can access the bucket and objects within. The following four settings are supported: • **Prevent the creation of ACLs that allow public access.** • **Prevent the creation of bucket policies that allow public access.** • **Ignore ACLs that allow public access.** • **Ignore bucket policies that allow public access.** To block public access, your account must have the **PutBucketPublicAccessBlock** permission. **If your services rely on public access to buckets or objects, blocking public access may interrupt their normal operation. Take care when blocking public access.** Enabling Block Public Access will make the public read and public read/write bucket policies unavailable. For more information, see **Block Public Access**.

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Parameter	Description
Bucket Policy	Controls read and write permissions for the bucket. • **Private**: Only users granted permissions by the bucket ACL can access the bucket. • **Public Read**: Anyone can read objects in the bucket. • **Public Read/Write**: Anyone can read, write, or delete objects in the bucket. If your account does not have permission to create a bucket policy, a private bucket will be created even if you select **Public Read** or **Public Read/Write**. To create a public bucket, your account must have the **obs:bucket:PutBucketPolicy** permission.
Enterprise Project	You can add the bucket to an enterprise project for unified management. To realize this, do as follows: On the enterprise project management page, **create an enterprise object**. Then, create a user group, add users to the user group, and add the user group to the created enterprise project. By doing so, the users obtain the operation permissions for the buckets and objects in the enterprise project. If you do not have any specific needs for enterprise project division and management, choose the **default** enterprise project. • Only an enterprise account can configure enterprise projects. • The OBS user group must have the **OBS Buckets Viewer** and **OBS OperateAccess** permissions for the enterprise project. • Creating the first bucket in a new enterprise project will take about 10 minutes.

Step 5 Configure parameters under **Properties**.

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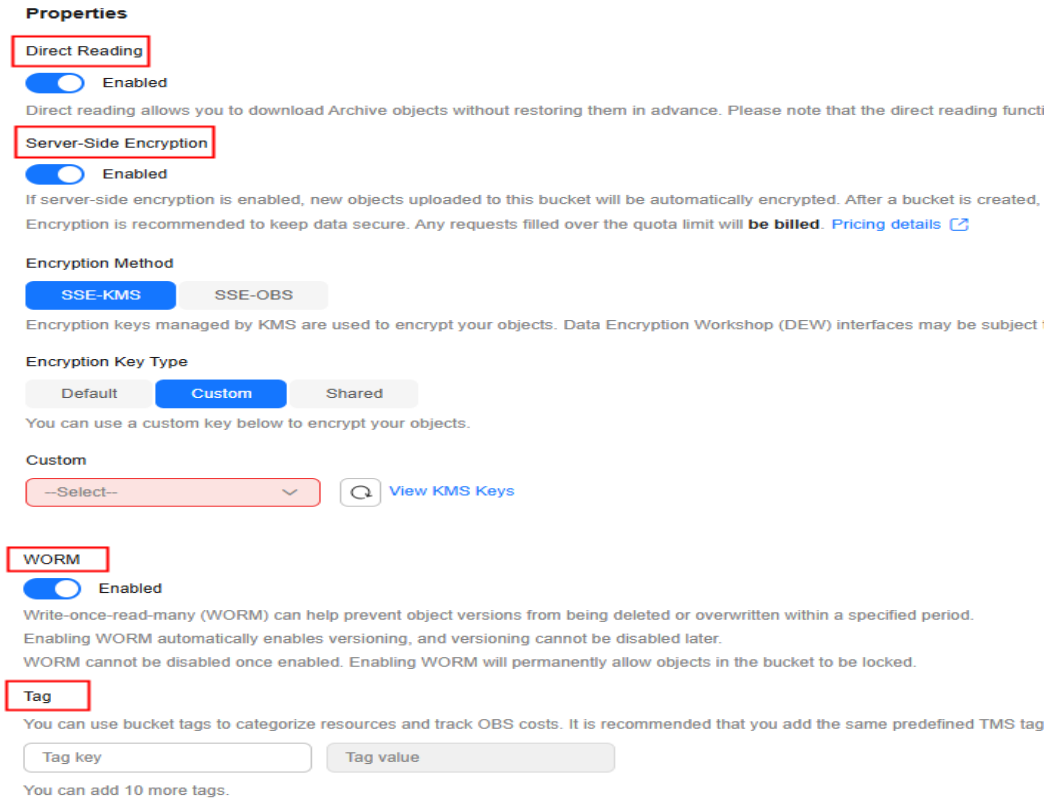

Table 2-3 Parameters under **Properties**

Parameter	Description
Direct Reading	After direct reading is enabled, you can access Archive objects (such as download or share an object or change an object's storage class) without having to restore them first. Direct reading will incur retrieval costs according to the objects' size. For details, see **Data Retrievals**. For more information, see **Direct Reading**.

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Parameter	Description
Server-Side Encryption	After server-side encryption is enabled, new objects uploaded to the bucket will be encrypted. With the encryption enabled, you can choose a required encryption method: • **SSE-KMS**: The encryption key managed in Data Encryption Workshop (DEW) is used to encrypt objects in your bucket. After choosing **SSE-KMS**, you need to specify an encryption key type: – **Default**: The default key in the current region will be used to encrypt the objects uploaded to the bucket. If no default key is available, OBS will create one the first time you upload an object. – **Custom**: Your custom key will be used to encrypt the objects uploaded to the bucket. If you do not have a custom key, click **View KMS Keys** to go to the Data Encryption Workshop (DEW) page and create one. Then, choose the created KMS key from the custom key drop-down list. – **Shared**: A shared key will be used to encrypt the objects uploaded to the bucket. You need to enter the ID of the shared key. To obtain a shared key ID, see **Viewing Key Details**. **NOTE** A shared key from **a project or a subproject** can be configured here. However, if a shared key from a subproject is specified, the owner of the shared key cannot access objects encrypted with that key, but the bucket owner can. Data Encryption Workshop (DEW) APIs have traffic control limits (see **DEW API Overview**). After SSE-KMS is used, your service access may be affected by traffic control. If SSE-KMS is used, you will be billed for what you use beyond the free quota given by KMS. For details, see **DEW Billing Items**. • **SSE-OBS**: The key created and managed by OBS will be used to encrypt the objects uploaded to the bucket. After you enable server-side encryption for the bucket, any object you upload to it will inherit the encryption settings from the bucket by default. You can also separately configure encryption for the object. For more information, see **Server-Side Encryption Overview**.

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Parameter	Description
WORM	You can enable write-once-read-many (WORM) to help prevent object versions from being deleted or overwritten within a specified period. • WORM cannot be disabled once enabled. However, you can choose whether to configure a retention policy to control whether objects can be written or deleted. • Enabling WORM automatically enables versioning, and versioning cannot be disabled later. • A bucket with WORM enabled does not support cross-region replication, and any existing cross-region replication rules applied to the bucket will become invalid. For more information, see **Configuring WORM to Protect Objects from Being Overwritten or Deleted**.
Tag	Optional. You can add tags to organize and manage buckets. You can customize a tag or choose one predefined on TMS. A tag is a key-value pair. • Tags associated with a bucket must have unique tag keys. A tag key: – Must contain 1 to 36 characters and be case sensitive. – Cannot start or end with a space or contain the following characters: ,/|<>=*\ • Tag values can be duplicate and can be left blank. A tag value: – Can contain 0 to 43 characters and must be case sensitive. – Cannot contain the following characters: ,/|<>=*\ A bucket can have up to 10 tags. Each tag has only one key and one value. For more information, see **Adding Tags to a Bucket**.

Step 6 Click **Create Now**.

----End

Using APIs

Specifying a Storage Class During Bucket Creation (adding the **x-obs-storage-class** header)

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Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 In the upper part of the page, click **Create Bucket**.

Step 3 In the displayed dialog box, configure bucket parameters, as shown in **Figure 2-1**.

Figure 2-1 Creating a bucket

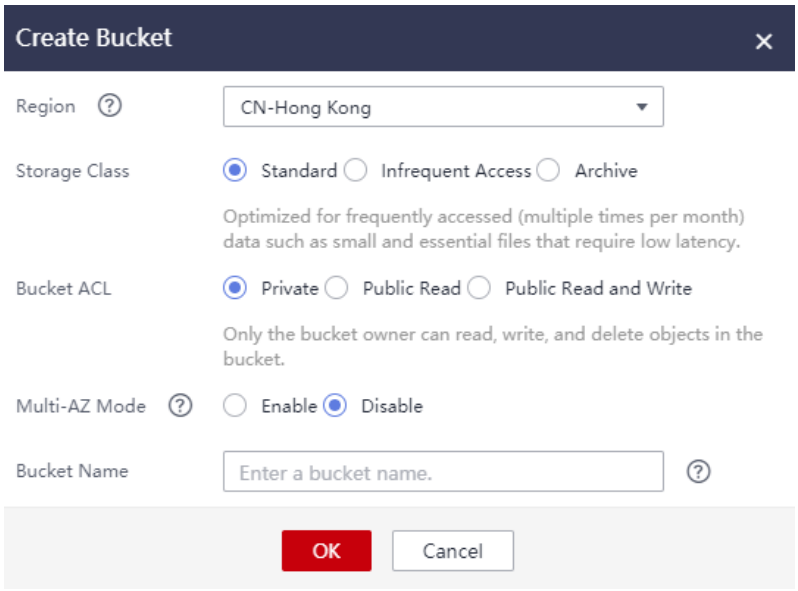

Table 2-4 Bucket creation parameters

Parameter	Description
Region	Enter the region where you want to create a bucket. • **Once the bucket is created, its region cannot be changed.** • For lower latency and faster access, create a bucket in the region nearest to you. • If you want your bucket to be accessed from an ECS over the intranet, ensure that the bucket and the ECS are in the same region. For details, see **Accessing OBS from an ECS over the Intranet**.

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Parameter	Description
Storage Class	Storage class of the bucket. Different storage classes meet customers' needs for storage performance and costs. • **Standard**: applicable to scenarios where a large number of hot files or small files need to be accessed frequently (multiple times per month on average) and require fast access response. • **Infrequent Access**: ideal for storing data that is not frequently accessed (less than 12 times per year on average) but requires fast access response. • **Archive**: suitable for archiving data that is rarely accessed (averagely once a year) and has no requirements for quick response. **NOTE** During the object upload, an object inherits its bucket's storage class by default, and you can also specify a different storage class for the object. For more information, see **Storage Class**.
Bucket ACL	Controls read and write permissions on buckets. • **Private**: Only users granted permissions by the ACL can access the bucket. • **Public Read**: Anyone can read objects in the bucket. • **Public Read and Write**: Anyone can read, write, or delete objects in the bucket.
Multi-AZ Mode	If multi-AZ storage is enabled, data in your bucket is stored in multiple AZs within a region. **After a bucket is created, its data redundancy policy cannot be changed.**

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Parameter	Description
Bucket Name	Name of the bucket you want to create, which must be globally unique. A bucket name: • Must be 3 to 63 characters long and start with a digit or letter. Only lowercase letters, digits, hyphens (-), and periods (.) are allowed. • Cannot be formatted as an IP address. • Cannot start or end with a hyphen (-) or period (.). • Cannot contain two consecutive periods (..), for example, **my..bucket**. • Cannot contain a period (.) and a hyphen (-) adjacent to each other, for example, **my-.bucket** or **my.-bucket**. **After a bucket is created, its name cannot be changed.** A user can create a maximum of 100 buckets in OBS. **NOTE** • You can click next to the **Bucket Name** text box to view the bucket naming rules. • When a URL is used to access a bucket, the bucket name will become part of the URL. According to the DNS rule, URLs do not support uppercase letters and cannot recognize buckets whose name contains uppercase letters. Therefore, a bucket name can contain only lowercase letters, digits, hyphens (-), and periods (.). For example, if you attempt to access bucket **MyBucket** using a URL, the URL will parse **MyBucket** as **mybucket**. This results in an access error. • DNS naming rules can standardize bucket names globally, facilitating the resolution during bucket access. With the DNS naming rules used, you can benefit from new functions and optimized features, and configure static website hosting for buckets.

Step 4 Click **OK**. If the bucket is successfully created, it is displayed in the bucket list. If the creation fails, an error message will be displayed.

----End

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
```
obsutil mb obs://bucket [-fs] [-az=xxx] [-acl=xxx] [-sc=xxx] [-location=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```
- In Linux or macOS
```
./obsutil mb obs://bucket [-fs] [-az=xxx] [-acl=xxx] [-sc=xxx] [-location=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

Examples

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- Take the Windows OS as an example. Run the **obsutil mb obs://bucket-test** command to create a bucket. The creation is successful.

```
obsutil mb obs://bucket-test
Start at 2024-09-29 07:52:11.3769487 +0000 UTC

Create bucket [bucket-test] successfully, request id [000001923CC401864018BA75753D2D5F]
```

- Take the Windows OS as an example. Run the **obsutil mb obs://bucket001** command to create a bucket with the same name as the bucket of another account. The creation fails.

```
obsutil mb obs://bucket001
Start at 2024-09-30 07:03:50.1378331 +0000 UTC

Create bucket [bucket001] failed, status [409], error code [BucketAlreadyExists], error message [The requested bucket name is not available. The bucket namespace is shared by all users of the system. Please select a different name and try again.], request id [0000019241BE18DB4019EDD66E135C56]
```

Parameter Description

Parameter	Optional or Mandatory	Description
bucket	Mandatory	The bucket name A bucket name must comply with the following rules: ● Contains 3 to 63 characters, including lowercase letters, digits, hyphens (-), and periods (.), and starts with a digit or letter. ● Cannot be an IP address. ● Cannot start or end with a hyphen (-) or period (.). ● Cannot contain two consecutive periods (.), for example, **my..bucket**. ● Cannot contain periods (.) and hyphens (-) adjacent to each other, for example, **my-.bucket** or **my.-bucket**.
fs	Optional (additional parameter)	Creates a parallel file system.
az	Optional (additional parameter)	The data redundancy policy that can be specified for a bucket to store data in a single AZ or multiple AZs in the same region The value is **multi-az**. If **multi-az** is used, a bucket with multi-AZ storage will be created. If this parameter is not included, a bucket with single-AZ storage will be created.

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Parameter	Optional or Mandatory	Description
acl	Optional (additional parameter)	The access control policy that can be specified when creating a bucket Possible values are: • **private**: Only users granted permissions by the bucket ACL can access the bucket. • **public-read**: Anyone can read objects in the bucket. • **public-read-write**: Anyone can read, write, or delete objects in the bucket.
sc	Optional (additional parameter)	The storage class of the bucket Different storage classes meet customers' needs for storage performance and costs. Possible values are: • **standard**: Standard storage class. It features low access latency and high throughput, and is applicable to storing frequently accessed data (multiple accesses per month) or data that is smaller than 1 MB. • **warm**: Infrequent Access storage class. It is ideal for storing infrequently accessed (less than 12 times a year) data, but when needed, the access has to be fast. • **cold**: Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once a year) data. • **deep-archive**: Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely (once every few years) accessed. This storage class costs less than the Archive storage class, but takes longer time (usually several hours) to restore data.

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Parameter	Optional or Mandatory	Description
location	Mandatory unless the requested OBS region is the default one (additional parameter)	The region where the bucket resides To view the currently valid regions, see **Regions and Endpoints**. • **Once the bucket is created, its region cannot be changed.** • For lower latency and faster access, select the region nearest to where the data will be accessed. • If you want your bucket to be accessed from an ECS over the intranet, ensure that the bucket and the ECS are in the same region. For details, see **Accessing OBS from an ECS over the Intranet**. **NOTE** This parameter indicates the region where a bucket will be created. It is mandatory only when the endpoint belongs to any other regions than the default one CN North-Beijing1 (cn-north-1).
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Configuring a Storage Class During Object Uploads

You can use **OBS Console**, APIs, OBS SDKs, OBS Browser+, or obsutil to configure a storage class when uploading an object.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

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Step 2 In the bucket list of **OBS Console**, click the desired bucket to go to the **Objects** page.

Step 3 On the object list page, click **Upload Object**.

You can also go to the folder where you want to upload the file and click **Upload Object**.

NOTE

If the files that you want to upload to OBS are stored in Microsoft OneDrive, it is recommended that the names of these files contain a maximum of 32 characters to ensure compatibility.

Step 4 Configure basic parameters.

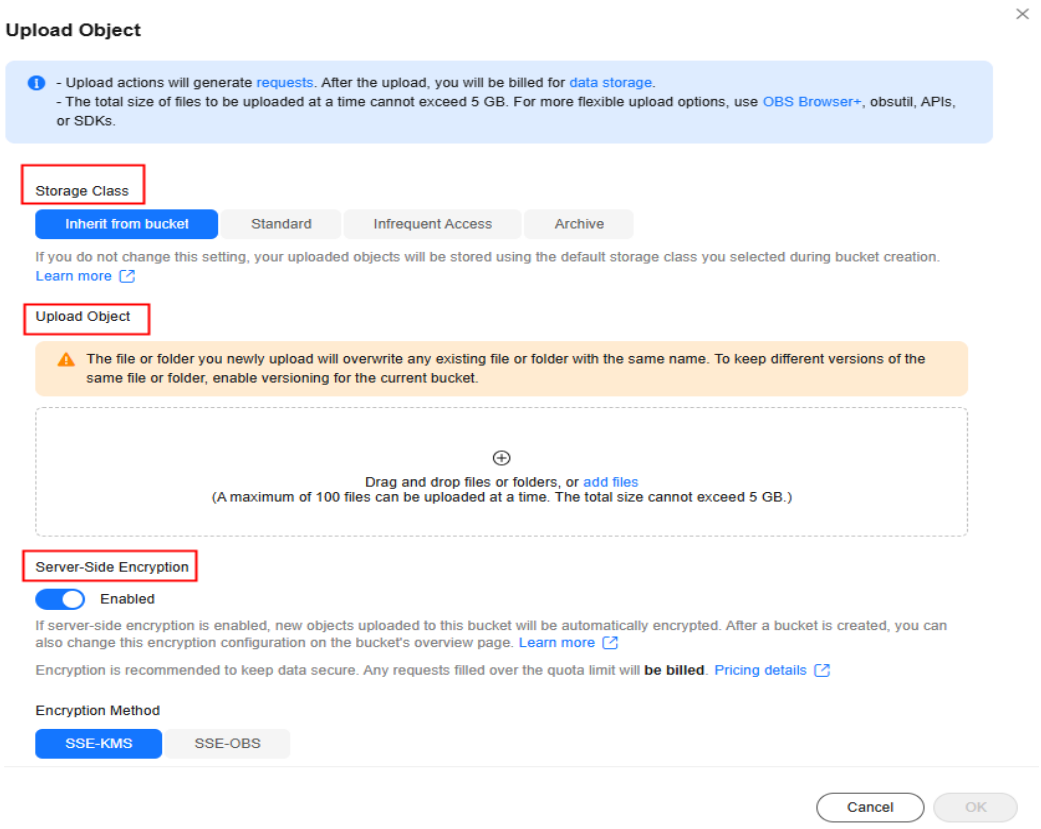

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Table 2-5 Basic parameters

Parameter	Description
Storage Class	The storage class of an object You can choose a storage class that meets your needs for storage performance and costs. • The Standard storage class is for storing a large number of hot files or small files that are frequently accessed (multiple times per month on average) and require fast access. • The Infrequent Access storage class is for storing data that is less frequently accessed (less than 12 times per year on average), but when needed, the access has to be fast. • The Archive storage class is for archiving data that is rarely accessed (once a year on average) and does not require fast access. For more information, see **Storage Class**.
Upload Object	Choose a required file and upload it to the OBS bucket. You can drag and drop the file or folder to the **Upload Object** area. Alternatively, click ⊕ or **add files** and choose the file using the local file browser. • A maximum of 100 files (no more than 5 GB in total) can be uploaded at a time. • If you upload only one file in a batch, this file cannot exceed 5 GB in size. • To upload more than 5 GB of objects, see **How Do I Upload Objects Larger Than 5 GB?** • Uploading objects incurs **request costs**. After objects are uploaded, there will be **storage costs**.

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Parameter	Description
Server-Side Encryption	Optional After server-side encryption is enabled, the uploaded objects will be encrypted. If the bucket has server-side encryption enabled, server-side encryption is enabled for any object uploaded to the bucket by default and cannot be disabled. With the encryption enabled, you can choose a required encryption method: • **Inherit from bucket**: This option is only available when the bucket has Server-Side Encryption enabled. Using this option makes the object you uploaded inherit the encryption settings of the bucket. • **SSE-KMS**: The encryption key managed in Data Encryption Workshop (DEW) is used to encrypt the object you uploaded. After choosing **SSE-KMS**, you need to specify an encryption key type: – **Default**: The default key in the current region will be used to encrypt the object you uploaded. If no default key is available, OBS will create one the first time you upload an object. – **Custom**: Your custom key will be used to encrypt the object you uploaded. If you do not have a custom key, click **View KMS Keys** to go to the Data Encryption Workshop (DEW) page and create one. Then, choose the created KMS key from the custom key drop-down list. – **Shared**: A shared key will be used to encrypt the object you uploaded. You need to enter the ID of the shared key. To obtain a shared key ID, see **Viewing Key Details**. **NOTE** A shared key from **a project or a subproject** can be configured here. However, if a shared key from a subproject is specified, the owner of the shared key cannot access objects encrypted with that key, but the bucket owner can. **DEW APIs have traffic control limits (see DEW API Overview). After SSE-KMS is used, your service access may be affected by traffic control.** If SSE-KMS is used, you will be billed for what you use beyond the free quota given by KMS. For details, see **DEW Billing Items**. • **SSE-OBS**: The key created and managed by OBS will be used to encrypt the object you uploaded. For more information, see **Server-Side Encryption Overview**.

Step 5 (Optional) Configure advanced parameters.

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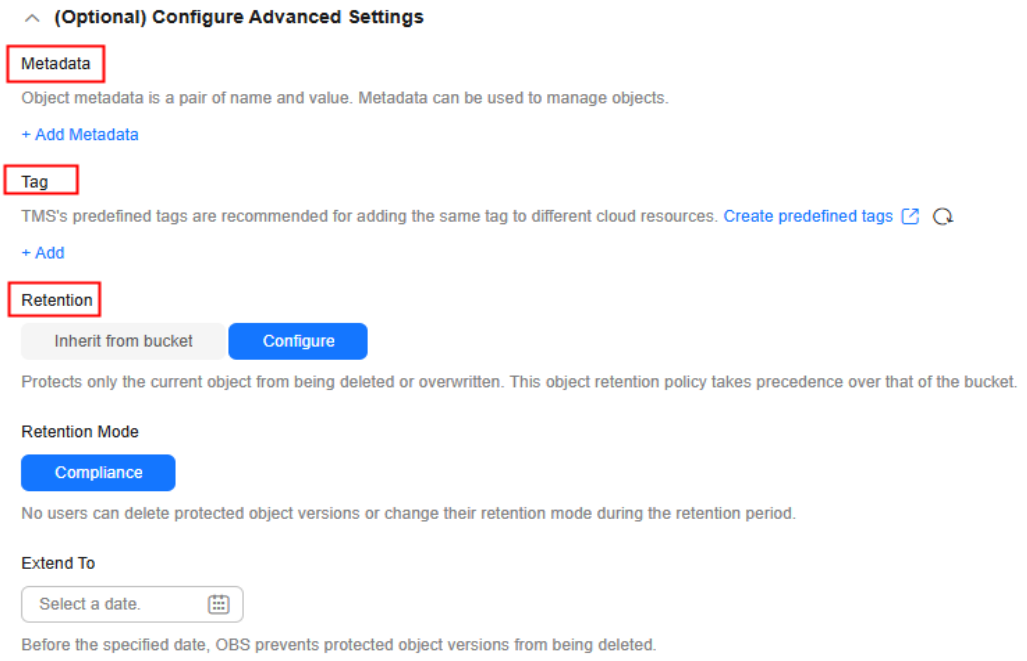

Table 2-6 Advanced parameters

Parameter	Description
Metadata	Object metadata is a set of name-value pairs that describe an object and is used for object management. To configure metadata, click **Add Metadata**. You can add the following metadata: **ContentDisposition**, **ContentLanguage**, **WebsiteRedirectLocation**, **ContentEncoding**, and **ContentType**. For more information, see **Configuring and Viewing Object Metadata**. The metadata key and value **must be specified**.
Tag	Add tags to the object you uploaded for categorization. You can customize a tag or choose one predefined on TMS. To add a tag, click **Add Tag** and enter a tag key and value. Each object can have **up to 10 tags**. **A tag key**: • Must be unique if there are multiple tags specified for an object. • Can be 36 characters long at most and cannot contain the following special characters: **,/|<>=***. It must be case sensitive and unique and cannot start or end with a space. It cannot be left blank. **A tag value**: For more information about object tags, see **Adding Tags to an Object**.

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Parameter	Description
Retention	WORM retention can be configured in the advanced settings during object upload only if WORM is enabled for the bucket. An object retention policy protects only the current object from being deleted or overwritten. This policy takes precedence over that of the bucket. • **Inherit from bucket**: The object inherits the default retention policy of its bucket. If no default retention is configured for the bucket, the object is not protected by WORM. • **Configure**: Configure a retention policy for the current object. – **Retention Mode**: Only **Compliance** is currently supported. In this mode, no users can delete protected object versions or change their retention mode during the specified retention period. – **Retention Period**: Before the specified date, OBS prevents protected object versions from being deleted.

Step 6 Click **Upload**.

----End

Using APIs

Specifying a Storage Class During Object Uploads with PUT (adding the **x-obs-storage-class** header)

Specifying a Storage Class During Object Uploads with POST (adding the **x-obs-storage-class** header)

Initiating a Multipart Upload (adding the **x-obs-storage-class** header during the initiation process if a multipart upload is used)

Using SDKs

Uploading objects	**Java**	**Python**	**C**	**Go**	**BrowserJS**	**.NET**	**Android**	**iOS**	**PHP**	**Node.js**
Multipart upload	**Java**	**Python**	**C**	**Go**	**BrowserJS**	**.NET**	**Android**	**iOS**	**PHP**	**Node.js**

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Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Click the bucket where you want to upload files or folders.

Step 3 Click **Upload**. The **Upload Object** dialog box is displayed.

Figure 2-2 Uploading a file or folder

Step 4 Set object parameters, including the object permission and storage class.

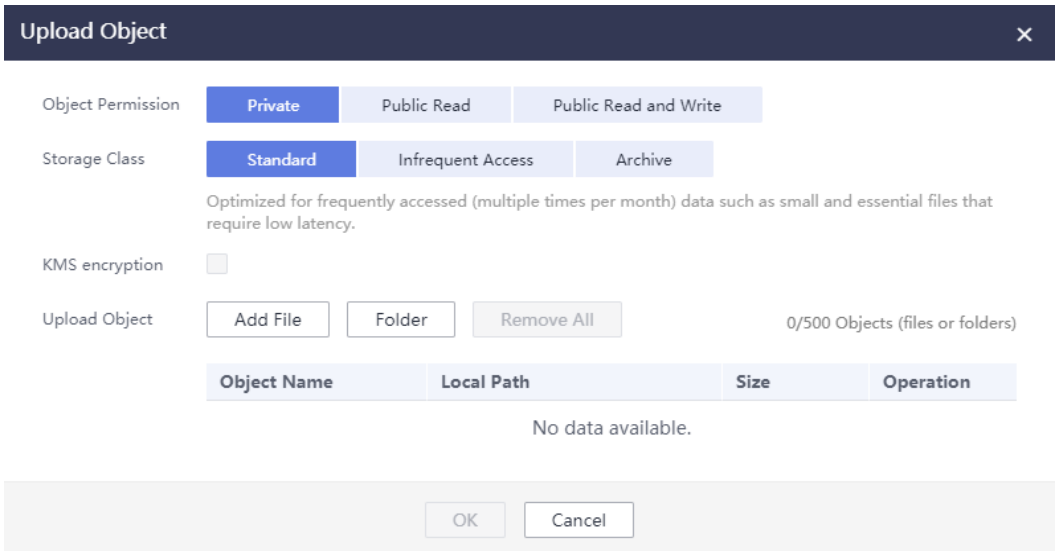

Table 2-7 Object parameters

Parameter	Description
Object Permission	Controls read and write permissions for the object. • **Private**: Only users granted permissions by the object ACL can access the object. • **Public Read**: Anyone can read the current object. • **Public Read and Write**: Anyone can read, write, or delete the current object.

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Parameter	Description
Storage Class	The storage class of the object You can choose a storage class that meets your needs for storage performance and costs. • The Standard storage class is for storing a large number of hot files or small files that are frequently accessed (multiple times per month on average) and require fast access. • The Infrequent Access storage class is for storing data that is less frequently accessed (less than 12 times per year on average), but when needed, the access has to be fast. • The Archive storage class is for archiving data that is rarely accessed (once a year on average) and does not require fast access. For more information, see **Storage Class**.
KMS encryption	Optional After KMS encryption is enabled, the default key in the current region is used to encrypt the object you uploaded to the current bucket.

Step 5 Click **Add File** or **Folder**. In the dialog box displayed, select the file or folder to be uploaded and click **Open**.

- You **must have access** to the file you want to upload, or the upload will fail.
- The file or folder name **cannot exceed 1,023 bytes**. If there are upper-level directories, the length of the file name plus the length of all upper-level directory names (including the automatically added slash (/)) cannot exceed 1,023 bytes. For example, if the upper-level directory of file **file01** is **folder01**, the file name length refers to the length of **folder01/file01**.
- A **single** file to be uploaded can be **up to 48.8 TB**.
- **A maximum of 500 files** can be uploaded **at a time**. If there are over 500 files to be uploaded, you are advised to put them into a folder and then upload the folder. You can upload one folder or multiple files at a time. To upload multiple files, hold down **Ctrl** or **Shift** to select the required files or press **Ctrl+A** to select all files and then upload them in a batch.

NOTE

1. If message "Service Unavailable" is displayed when files are being uploaded, try again later.
2. If an access deny message is displayed when you are uploading a file or folder, possible causes are as follows:
   - Access to the bucket is restricted by an ACL. For example, you do not have the write permission for the bucket.
   - Access to the bucket is restricted by a bucket policy. For example, you do not have the write permission for the bucket, or write operations cannot be performed on the bucket during the current period.

   If such message is displayed, check the ACL and policy settings of the bucket and resolve the problem accordingly.

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Step 6 Click **OK**.

----End

Using the CLI Tool - obsutil

Command Line Structure

- Windows:
  - Uploading a file
    ```
    obsutil cp file_url obs://bucket[/key] [-arcDir=xxx] [-dryRun] [-link] [-u] [-vlength] [-vmd5] [-p=1] [-threshold=5248800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-o=xxx] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Uploading a folder
    ```
    obsutil cp folder_url obs://bucket[/key] -r [-arcDir=xxx] [-dryRun] [-link] [-f] [-flat] [-u] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Uploading multiple files/folders
    ```
    obsutil cp file1_url,folder1_url|filelist_url obs://bucket[/prefix] -msm=1 [-r] [-arcDir=xxx] [-dryRun] [-link] [-f] [-u] [-vlength] [-vmd5] [-flat] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx][-timeRange=time1-time2] [-at] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

    NOTE

    In this command, **/prefix** is the name prefix for uploading folders.
- Linux or macOS:
  - Uploading a file
    ```
    ./obsutil cp file_url obs://bucket[/key] [-arcDir=xxx] [-dryRun] [-link] [-u] [-vlength] [-vmd5] [-p=1] [-threshold=5248800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-o=xxx] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Uploading a folder
    ```
    ./obsutil cp folder_url obs://bucket[/key] -r [-arcDir=xxx] [-dryRun] [-link] [-f] [-flat] [-u] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-at] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Uploading multiple files/folders
    ```
    ./obsutil cp file1_url,folder1_url|filelist_url obs://bucket[/prefix] -msm=1 [-r] [-arcDir=xxx] [-dryRun] [-link] [-f] [-u] [-vlength] [-vmd5] [-flat] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx][-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

    NOTE

    In this command, **/prefix** is the name prefix for uploading folders.

Examples

- Take the Windows OS as an example. Run the **obsutil cp d:\temp\test.txt obs://bucket-test/key** command to upload the **test.txt** file in the **temp** directory in the **D:** drive to bucket **bucket-test** and rename the file as **key**.
  ```
  obsutil cp d:\temp\test.txt obs://bucket-test/key
  Start at 2024-09-30 08:11:41.6724827 +0000 UTC

  Parallel:      5                 Jobs:         5
  Threshold:     50.00MB           PartSize:     auto
  VerifyLength:  false             VerifyMd5:    false
  CheckpointDir: C:\Users\Administrator\.obsutil_checkpoint
  ```

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```
[====================================================] 100.00% 1.68 MB/s 8.46MB/
8.46MB 5s
Upload successfully, 8.46MB, n/a, d:\temp\test.txt --> obs://bucket-test/key, cost [5], status [200],
request id [0000016979E1D2B2860BB5181229C72C]
```

- Take the Windows OS as an example. Run the **obsutil cp d:\temp obs://bucket-test -f -r** command to recursively upload all files and subfolders in the **temp** directory in the **D:** drive to the **temp** folder in bucket **bucket-test**.

```
obsutil cp d:\temp obs://bucket-test -f -r
Start at 2024-09-30 08:14:12.1406275 +0000 UTC

Parallel:      5                 Jobs:         5
Threshold:     50.00MB           PartSize:     auto
VerifyLength:  false             VerifyMd5:    false
CheckpointDir: C:\Users\Administrator\.obsutil_checkpoint

Task id: 104786c8-27c2-48fc-bc6a-5886596fb0ed
OutputDir: C:\Users\Administrator\.obsutil_output

[====================================================] 100.00% tps:35.71 2.02 KB/s
7.20MB/7.20MB 0s
Succeed count:   5        Failed count:    0
Succeed bytes:     xxx
Metrics [max cost:90 ms, min cost:45 ms, average cost:63.80 ms, average tps:35.71, transferred size:
7.20MB]

Task id: 104786c8-27c2-48fc-bc6a-5886596fb0ed
```

Parameter Description

Parameter	Optional or Mandatory	Description
file_url	Optional for uploading multiple files/folders Mandatory for uploading a file	The local file path ● Do not nest paths when uploading multiple files/folders. For example, you cannot specify **/a/b/c** and **/a/b/** at the same time. ● If this parameter is configured when uploading multiple files/folders, **msm** must be set to **1**. In this case, use commas (,) to separate multiple file paths, for example, **file_url1,file_url2**. ● Files and folders can both be included when uploading multiple files/folders. For example, **file_url1,folder_url1,file_url2,folder_url2**.

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Parameter	Optional or Mandatory	Description
folder_url	Optional for uploading multiple files/folders Mandatory for uploading a folder	The local folder path • If **flat** is not configured when uploading a folder, the entire folder is uploaded. If **flat** is configured, all files in the folder are uploaded. • Do not nest paths when uploading multiple files/folders. For example, you cannot specify **/a/b/c** and **/a/b/** at the same time. • If this parameter is configured when uploading multiple files/folders, **msm** must be set to **1**. In this case, use commas (,) to separate multiple folder paths, for example, **folder_url1,folder_url2**. • Files and folders can both be included when uploading multiple files/folders. For example, **file_url1,folder_url1,file_url2,folder_url2**.
filelist_url	Optional for uploading multiple files/folders	The path of the file that contains the list of files/folders to be uploaded. If this parameter is configured, **msm** must be set to **2**. • The list file is in common text file formats, such as TXT and CSV. Each line in the file indicates a file or folder to be uploaded. For example: file_url1 file_url2 folder_url1 folder_url2 • Do not nest paths in the list file. For example, you cannot specify **/a/b/c** and **/a/b/** at the same time.
bucket	Mandatory	The name of the bucket where you will upload the file or folder

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Parameter	Optional or Mandatory	Description
key	Optional	The object name or object name prefix specified when uploading a file, or the object name prefix specified when uploading a folder When uploading a file or folder, the upload path and name change depending on the value of this parameter. The specific rules are as follows: • If this parameter is left blank, the object is uploaded to the root directory of the bucket, and the object name is the name of the uploaded file or folder. • If this parameter is specified: – If the parameter value ends with a slash (/), the object is uploaded to the directory indicated by this value, and the object name is the parameter value plus the file name, for example, **folder/filename.txt** or **folder/foldername**. – If the parameter value does not end with a slash (/), the object name for the file is the parameter value, for example, **filename.txt**, and the object name for the folder is the parameter value plus a slash (/), for example, **folder/**, which is also the name of the directory where the folder is uploaded. **NOTE** For details about how to use this parameter, see **Upload**.
fr	Optional for uploading a file (additional parameter)	Generates an operation result file when uploading a file.
flat	Optional for uploading a folder or multiple files/folders (additional parameter)	Uploads all files in a folder but not the folder itself.
arcDir	Optional (additional parameter)	The path to which the uploaded files are archived
dryRun	Optional (additional parameter)	Conducts a dry run.

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Parameter	Optional or Mandatory	Description
link	Optional (additional parameter)	The actual path of a symbolic link for a file or folder • If this parameter is not specified and the file to be uploaded is a symbolic-link file whose target file does not exist, the exception message "The system cannot find the file specified" will be displayed in Windows OS, while the exception message "No such file or directory" will be displayed in macOS or Linux OS. • Avoid the symbolic link loop of a folder, otherwise, the upload will exit due to panic. If you do not want the system to panic, set **panicForSymbolicLinkCircle** to **false** in the configuration file.
u	Optional (additional parameter)	Indicates incremental upload. If this parameter is set, each file can be uploaded only when it does not exist in the bucket, its size is different from the namesake one in the bucket, or it has the latest modification time. **When you compare each local file with data in the bucket, a billable HEAD request is generated. For details, see Requests.**
vlength	Optional (additional parameter)	After the upload completes, checks whether the sizes of the objects in the bucket are the same as those of the local files.
vmd5	Optional (additional parameter)	After the upload completes, checks whether the MD5 values of the objects in the bucket are the same as those of the local files. • **If your object needs encryption, do not use this parameter.** • If the size of the file or folder to be uploaded is too large, using this parameter will degrade the overall performance due to MD5 calculation. • After the MD5 verification is successful, this parameter value is used for metadata **x-obs-meta-md5chksum**, for later MD5 verification during download or copy.
p	Optional (additional parameter)	The maximum number of concurrent uploads for a multipart upload The default value is the value of **defaultParallels** in the configuration file.

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Parameter	Optional or Mandatory	Description
threshold	Optional (additional parameter)	The threshold for enabling multipart upload. If the size of the file or folder to be uploaded is smaller than the threshold, upload it directly. Otherwise, a multipart upload is required. The default value is the value of **defaultBigfileThreshold** in the configuration file. Unit: byte This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes). **NOTE** If you upload a file or folder directly, no part record is generated, and resumable transmission is not supported.
acl	Optional (additional parameter)	The access control policies that can be specified for objects when uploading files. Possible values are: • **private**: Only users granted permissions by the object ACL can access the object. • **public-read**: Anyone can read objects in the bucket. • **public-read-write**: Anyone can read, write, or delete objects in the bucket. • **bucket-owner-full-control**: Only the bucket owner has full control over objects in the bucket.

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Parameter	Optional or Mandatory	Description
sc	Optional (additional parameter)	The storage classes of objects that can be specified when uploading files Possible values are: • **standard**: Standard storage class. It features low access latency and high throughput, and is applicable to storing frequently accessed data (multiple accesses per month) or data that is smaller than 1 MB. • **warm**: Infrequent Access storage class. It is ideal for storing infrequently accessed (less than 12 times a year) data, but when needed, the access has to be fast. • **cold**: Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once a year) data. • **deep-archive**: Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely (once every few years) accessed. This storage class costs less than the Archive storage class, but takes longer time (usually several hours) to restore data.
meta	Optional (additional parameter)	The standard or user-defined metadata that can be specified during file upload • Standard metadata includes **Content-Type**, **Content-Encoding**, **Cache-Control**, **Content-Disposition**, **Content-Language** and **Expires**. • User-defined metadata must be in the format of *key:value*. Multiple user-defined metadata items are separated by number signs (#), for example, *key1:value1*#*key2:value2*#*key3:value3*, which indicates that the file uploaded to the bucket contains three groups of user-defined metadata: *key1:value1*, *key2:value2*, and *key3:value3*.

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Parameter	Optional or Mandatory	Description
ps	Optional (additional parameter)	The size of each part in a multipart upload task • The default value is the value of **defaultPartSize** in the configuration file. The parameter can be set to **auto**. In this case, obsutil automatically configures the part size for each multipart task based on the source file size. • Range: **100KB** to **5GB** • Unit: byte. This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes).
cpd	Optional (additional parameter)	The folder where the part records reside. The default value is **.obsutil_checkpoint**, the subfolder in the home directory of the user who executes obsutil commands. A part record is generated during a multipart upload and saved to the **upload** subfolder. After the upload succeeds, its part record is deleted automatically. If the upload fails or is suspended, the system attempts to resume the task according to its part record when you perform the upload the next time.
r	Mandatory for uploading a folder (additional parameter) Optional for uploading multiple files/ folders	Recursively uploads all files and subfolders within a folder.
f	Optional for uploading a folder or multiple files/ folders (additional parameter)	Runs in force mode.
j	Optional for uploading a folder or multiple files/ folders (additional parameter)	The maximum number of concurrent tasks for uploading a folder. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.

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Parameter	Optional or Mandatory	Description
msm	Mandatory for uploading multiple files/ folders (additional parameter)	Enables the mode for uploading multiple files/folders. Possible values are **1** and **2**. ● If **msm** is set to **1**, the source URL indicates a list of file/folder names separated by commas. ● If **msm** is set to **2**, the source URL indicates a file containing a list of file/folder names. ● If the file or folder name already contains commas (,), do not set **msm** to **1**. ● If parameter **r** is not set, the folders in the list will not be uploaded.
exclude	Optional for uploading a folder or multiple files/ folders (additional parameter)	The file matching patterns that are excluded. After this parameter is specified, if the name of the file to be uploaded matches the value of this parameter, the file is skipped. For example, if this parameter is set to ***.txt**, all files whose names end with **.txt** are skipped and not uploaded. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent ***** and **\?** to represent **?**. ● Multiple **exclude** parameters can be specified, for example, **-exclude=*.xxx -exclude=*.xxx**. **Restrictions**: The matching pattern takes effect only for files in the folder. **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute file path (including the file name and file directory).

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Parameter	Optional or Mandatory	Description
include	Optional for uploading a folder or multiple files/ folders (additional parameter)	The file matching patterns that are included. After this parameter is specified, if the name of the file to be uploaded matches the value of this parameter, the file is uploaded. For example, if this parameter is set to ***.txt**, all files whose names end with **.txt** are uploaded. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent * and **\?** to represent **?**. ● Multiple **include** parameters can be specified, for example, **-include=*.xxx -include=*.xxx**. **Restrictions**: ● The matching pattern takes effect only for files in the folder. ● If both the **exclude** and **include** parameters are configured, the **exclude** rules are applied first. If the name of a file to be uploaded does not match **exclude**, OBS checks whether the file name matches **include**. If yes, the file is uploaded. If no, the file is skipped. **Example:** `./obsutil cp /localpath/ obs://test/ -include=/localpath/2022-12-09/* -f -r` This command uploads files that are under **localpath** and start with **/localpath/2022-12-09/** to bucket **test**. **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute file path (including the file name and file directory).

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Parameter	Optional or Mandatory	Description
at	Optional for uploading a folder or multiple files/ folders (additional parameter)	Indicates that only the files whose latest access time is within the value of **timeRange** are uploaded. This parameter must be used together with **timeRange**.
disableDirObject	Optional for uploading multiple folders (additional parameter)	Indicates the folders themselves are not uploaded as an object. Configuring this parameter can avoid uploading empty folders to a bucket. If a folder contains files, the files will be uploaded and the original path format is retained.
timeRange	Optional for uploading a folder or multiple files/ folders (additional parameter)	The time range matching pattern when uploading files. Only files whose latest modification time is within the configured time range are uploaded. This pattern has a lower priority than the file matching patterns (**exclude**/**include**). That is, the time range matching pattern is executed after the configured file matching patterns. ● Time in the matching pattern is the UTC time. ● The matching time range is represented in *time1*-*time2*, where *time1* must be earlier than or the same as *time2*. The time format is *yyyyMMddHHmmss*. ● Automatic formatting is supported. For example, *yyyyMMdd* is equivalent to *yyyyMMdd***000000**, and *yyyyMM* is equivalent to *yyyyMM***01000000**. ● If this parameter is set to ***-***time2*, all files whose last modification time is earlier than *time2* are matched. If it is set to *time1*-*, all files whose last modification time is later than *time1* are matched.
mf	Optional (additional parameter)	Indicates that the name matching pattern (**include** or **exclude**) and the time matching pattern (**timeRange**) also take effect on folders.

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Parameter	Optional or Mandatory	Description
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (possibly success, failure, and warning files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. • A result file should be named as follows: **cp_{succeed | failed | warning}_report**_*time*_*TaskId***.txt**. • By default, the maximum size of a single result file is 30 MB. You can set the maximum size by configuring **recordMaxLogSize** in the configuration file. • By default, the maximum number of result files that can be retained is 1,024. You can set the maximum number by configuring **recordBackups** in the configuration file. • If there are multiple folders and files and you need to confirm the details of a failed task, refer to the failure result file **cp_failed_report**_*time*_*TaskId***.txt** in the result folder and the **log files** in the log path.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

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Helpful Links

- Why Am I Unable to Create a Bucket?
- Why Am I Unable to Upload an Object?
- Does OBS Support Batch Upload?
- How Do I Upload Objects Larger Than 5 GB?

2.3 Changing the Storage Class of a Bucket or Object

Scenarios

This section describes how to change the storage classes of a bucket or object.

Constraints

- The storage class of a bucket can only be manually changed. The storage class of an object can be changed manually or automatically based on lifecycle rules.
- The data redundancy policy remains unchanged when the storage class is changed. If a bucket or object is configured with multi-AZ redundancy, it can only be moved to a storage class that supports multi-AZ redundancy, such as the Standard or Infrequent Access storage class. However, it cannot be moved to the Archive storage class, which does not support multi-AZ redundancy.

Manually Changing the Storage Class of a Bucket

OBS allows you to move a bucket to any storage class manually, but does not support using lifecycle rules to do that.

NOTE

- Changing the storage class of a bucket does not change the storage classes of existing objects in the bucket. The storage class of an object uploaded later will inherit the new storage class of the bucket by default. You can **configure lifecycle rules** to change storage classes of objects in batches.

  For example, suppose a bucket, **bucket1**, is in the Standard storage class and contains an object, **object1**, also in the Standard storage class. If **bucket1**'s storage class is transitioned to Infrequent Access, then **object1** will remain in the Standard storage class, but a new object, **object2**, uploaded after the change of the bucket storage class, will be in the Infrequent Access storage class.
- After a bucket is changed from Archive or Deep Archive to Standard or Infrequent Access, existing Archive or Deep Archive objects in the bucket will not be automatically restored.

You can use **OBS Console**, APIs, OBS SDKs, or obsutil to change the storage class of a bucket.

Using OBS Console

Step 1 Log in to **OBS Console**. In the navigation pane, choose **Object Storage**.

Step 2 In the bucket list, locate the bucket whose storage class you want to change and click **Change Storage Class** in the **Operation** column on the right.

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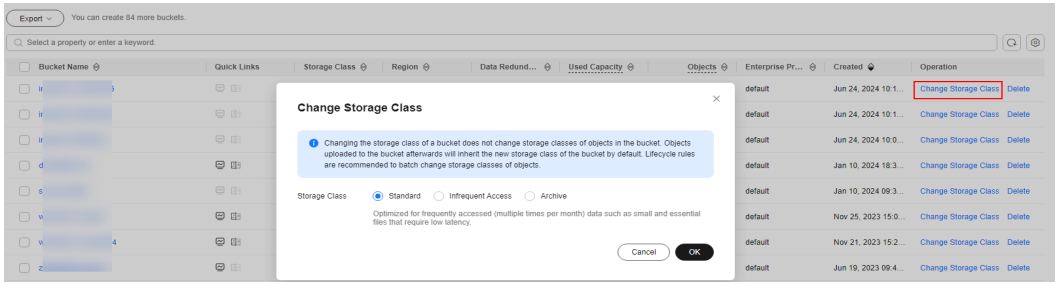
Step 3 Choose a new storage class and click **OK**.

Figure 2-3 Manually changing the storage class of a bucket



----End

Using APIs

[Configuring Storage Class for a Bucket]

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
  obsutil chattri obs://bucket [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
- In Linux or macOS
  ./obsutil chattri obs://bucket [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]

Examples

If you are using Windows, run **obsutil chattri obs://bucket-test -sc=standard** to change the bucket's storage class to Standard.

```
obsutil chattri obs://bucket-test -sc=standard

Start at 2024-09-29 07:58:46.0506904 +0000 UTC

Set the sc of bucket [bucket-test] to [standard] successfully, request id [04050000016836C5DA6FB21F14A2A0C0]
```

Parameter Description

Parameter	Optional or Mandatory	Description
bucket	Mandatory	The name of the bucket whose storage class needs to be changed

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Parameter	Optional or Mandatory	Description
sc	Optional (additional parameter)	The new storage class of the bucket You can choose a storage class that meets your needs for storage performance and costs. Possible values are: • **standard**: The Standard storage class. It features low access latency and high throughput, and is suitable for storing frequently accessed data (multiple times per month on average) or data that is smaller than 1 MB. • **warm**: The Infrequent Access storage class. It is suitable for storing infrequently accessed (less than 12 times per year on average) data, but when needed, the access has to be fast. It has a slightly lower availability than Standard. • **cold**: The Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once per year on average) data. • **deep-archive**: The Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely accessed (once every few years on average). This storage class costs less than the Archive storage class, but takes longer (usually several hours) to restore data.
acl	Optional (additional parameter)	The predefined access control policy of the bucket. Possible values are: • **private**: Only users granted permissions by the bucket ACL can access the bucket. • **public-read**: Anyone can read objects in the bucket. • **public-read-write**: Anyone can read, write, or delete objects in the bucket.

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Parameter	Optional or Mandatory	Description
aclXml	Optional (additional parameter)	The bucket's access control policy, in XML format <AccessControlPolicy> <Owner> <ID>*ownerid*</ID> </Owner> <AccessControlList> <Grant> <Grantee> <ID>*userid*</ID> </Grantee> <Permission>*[WRITE|WRITE_ACP|READ|READ_ACP|FULL_CONTROL]*</Permission> </Grant> <Grant> <Grantee> <Canned>Everyone</Canned> </Grantee> <Permission>*[WRITE|WRITE_ACP|READ|READ_ACP|FULL_CONTROL]*</Permission> </Grant> </AccessControlList> </AccessControlPolicy> • **Owner**: Optional. It specifies the bucket owner's ID. • In **AccessControlList**, **Grant** specifies the authorized users. **Grantee** specifies the IDs of authorized users. **Canned** specifies the authorized user group (only **Everyone** is supported currently). • The following permissions can be granted: **WRITE** (write), **WRITE_ACP** (write ACL), **READ** (read), **READ_ACP** (read ACL), and **FULL_CONTROL** (full control). Because angle brackets (<) and (>) are unavoidably included in the parameter value, **you must use quotation marks to enclose them for escaping** when running the command. Use **single quotation marks for Linux and macOS and double quotation marks for Windows**.
config	Optional (additional parameter)	User-defined configuration file for executing the current command. To learn the parameters that can be configured in this file, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK

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Parameter	Optional or Mandatory	Description
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Manually Changing the Storage Class of an Object

OBS allows you to move an object to any storage class manually. For objects that are in the Archive or Deep Archive storage class, you must restore them first before changing their storage classes. OBS also supports automatic change of object storage classes. For details, see **Transitioning Objects Between Storage Classes Using Lifecycle Rules**.

NOTE

- If the objects are in the Infrequent Access, Deep Archive, or Archive storage class, changing their storage class may incur costs for the **minimum storage duration**.
- Even though objects that are in the Infrequent Access storage class do not need to be restored manually, you still need to pay for **restoration requests and traffic**.
- When changing the storage class of objects that are in the Archive or Deep Archive storage, you are charged for **restoration requests, traffic, and temporary copy storage**.

You can use **OBS Console**, APIs, OBS SDKs, OBS Browser+, or obsutil to change the storage class of an object.

Using OBS Console

Step 1 Log in to **OBS Console**. In the navigation pane, choose **Object Storage**.

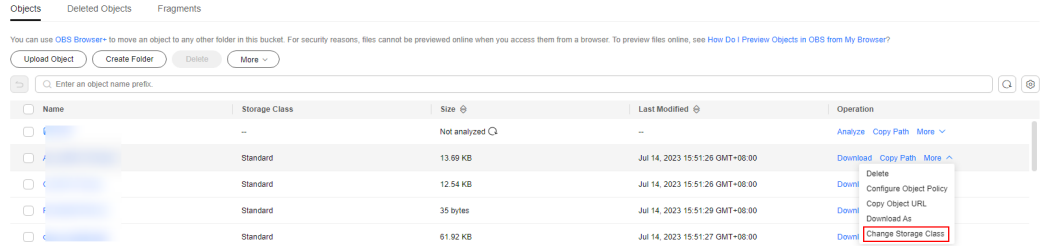
Step 2 In the bucket list, click the bucket name you want. The **Objects** page is displayed.

Step 3 Restore objects that are in the Archive or Deep Archive storage class if there are any. For details, see **Restoring an Object from Archive or Deep Archive Storage**.

Step 4 Change the storage class of objects individually or in a batch.

1. Individually: In the object list, locate the desired object and choose **More** > **Change Storage Class** in the **Operation** column on the right.

Figure 2-4 Changing object storage classes individually



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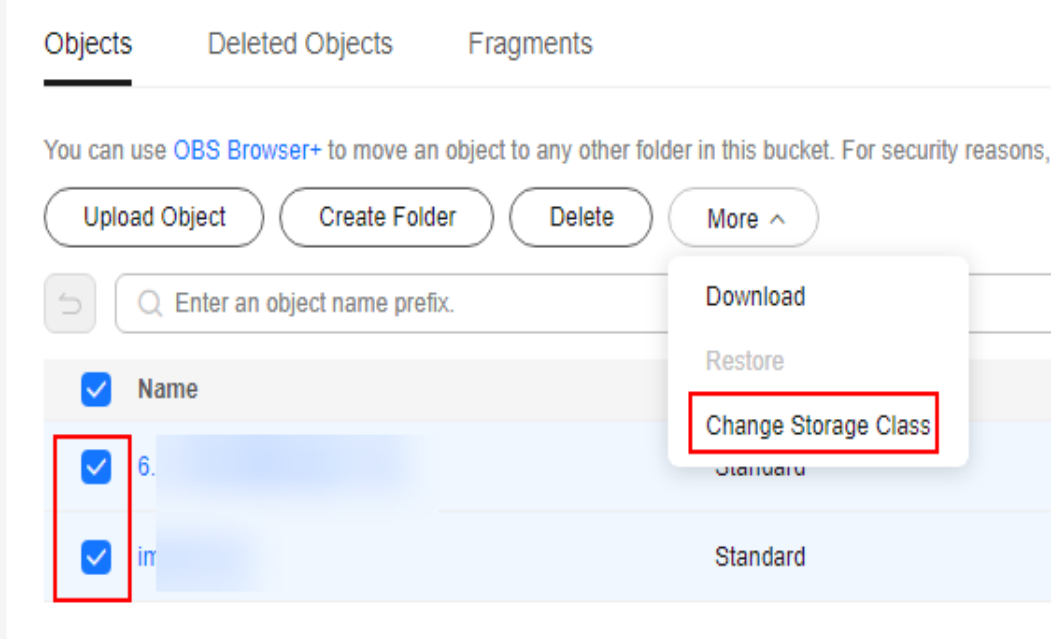
2. In a batch: In the object list, select the desired objects and choose **More** > **Change Storage Class** above the object list.

   NOTE

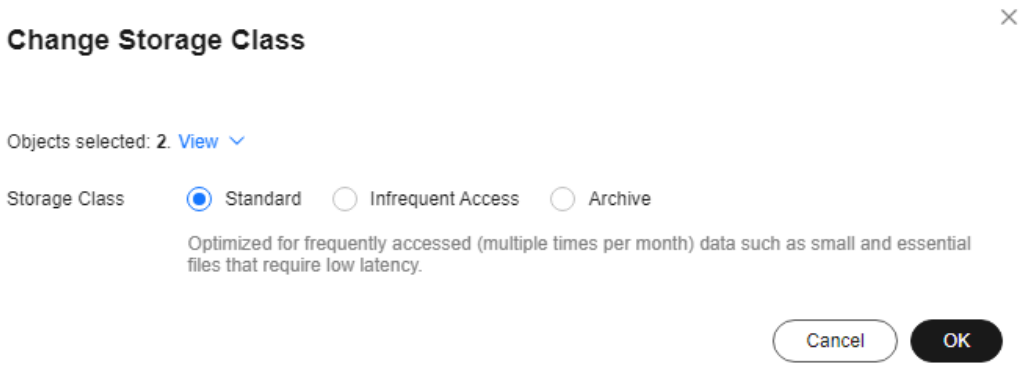
   Changing object storage classes in a batch is only available in some regions. For region-specific availability, see **OBS Console**.

   Figure 2-5 Changing object storage classes in a batch



Step 5 Choose a new storage class and click **OK**.

Figure 2-6 Choosing a new storage class



----End

Using APIs

OBS provides two APIs for you to manually change the storage class of objects. You can call an API to:

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> **CAUTION**
>
> Before changing the storage class of Archive or Deep Archive objects, you must make an API call to restore them. For details, see **Restoring Archive or Deep Archive Objects**.

- Modify object metadata (adding the **x-obs-storage-class** header). For details, see **Modifying Object Metadata**.
- Copy an object (adding the **x-obs-storage-class** header). For details, see **Copying an Object**. If a bucket has versioning enabled, OBS automatically generates a unique version ID for a new object copy. If a bucket has versioning disabled or suspended, the existing object will be overwritten by a new object copy.

Using SDKs

> **CAUTION**
>
> Before changing the storage class of Archive or Deep Archive objects, you must make an API call to restore them.

Modifying object metadata	**Java**	**Python**	**C**	**Go**	**BrowserJS**	**.NET**	**Android**	**iOS**	**PHP**	**Node.js**
Copying objects	**Java**	**Python**	**C**	**Go**	**BrowserJS**	**.NET**	**Android**	**iOS**	**PHP**	**Node.js**

Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Click the name of the bucket that contains the object you want to modify the storage class for. The **Objects** page is displayed.

Step 3 If the storage class of the object to be modified is **Archive** or **Deep Archive**, right-click the object and choose **Restore** from the shortcut menu. After the restoration is complete, go to **Step 4**.

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Step 4 Right-click the object to be modified and choose **Change Storage Class** from the shortcut menu.

Step 5 Select the desired storage class and click **OK**.

----End

Using the CLI Tool - obsutil

obsutil allows you to change the storage class of an object by modifying its properties.

CAUTION

Before changing the storage class of Archive or Deep Archive objects, you must run a command to restore them. For details, see **Restoring Objects**.

- In Windows
  - Setting properties of a single object
    ```
    obsutil chattri obs://bucket/key [-meta=aaa:bbb#ccc:ddd] [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-versionId=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Setting properties of objects in batches
    ```
    obsutil chattri obs://bucket[/key] -r [-f] [-v] [-meta=aaa:bbb#ccc:ddd] [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-o=xxx] [-j=1] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
- In Linux or macOS
  - Setting properties of a single object
    ```
    ./obsutil chattri obs://bucket/key [-meta=aaa:bbb#ccc:ddd] [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-versionId=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Setting properties of objects in batches
    ```
    ./obsutil chattri obs://bucket[/key] -r [-f] [-v] [-meta=aaa:bbb#ccc:ddd] [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-o=xxx] [-j=1] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

Examples

- If you are using Windows, run **obsutil chattri obs://bucket-test/key -sc=standard** to change the object's storage class to Standard.
  ```
  obsutil chattri obs://bucket-test/key -sc=standard
  Start at 2024-09-30 08:17:15.5572914 +0000 UTC

  Set the sc of object [key] in the bucket [bucket-test] to [standard] successfully, request id [04050000016836DDFA73B2B5320E2651]
  ```
- If you are using Windows, run **obsutil chattri obs://bucket-test -r -f -sc=standard** to change the storage class of all objects in the bucket to Standard.
  ```
  obsutil chattri obs://bucket-test -r -f -sc=standard
  Start at 2024-09-30 08:18:03.105373 +0000 UTC

  [----------------------------------------------------] 100.00% tps:155.15 5/5 233ms
  Succeed count:  5       Failed count:   0
  Metrics [max cost:177 ms, min cost:53 ms, average cost:102.40 ms, average tps:20.41]
  Task id: 9d7f73ff-f747-4fdd-9b2a-815ba2dc3b07
  ```

Parameter Description

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Parameter	Optional or Mandatory	Description
bucket	Mandatory	The name of the bucket that contains the objects whose storage class needs to be changed
key	Mandatory for a single object Optional for a batch of objects	The name of a single object, or the name prefix of a batch of objects If this parameter is left blank for a batch operation, the operation applies to all objects in the bucket.
meta	Optional (additional parameter)	Standard or custom metadata that can be specified for destination objects in object replication • Standard metadata includes **Content-Type**, **Content-Encoding**, **Cache-Control**, **Content-Disposition**, **Content-Language** and **Expires**. • Custom metadata is in the **key1:value1#key2:value2#key3:value3** format. This format example indicates that the destination objects contain three pairs of custom metadata: **key1:value1**, **key2:value2**, and **key3:value3**. This parameter must be used together with **direct**.
direct	Optional (additional parameter)	Metadata directive The options are: **REPLACE_NEW**: The existing metadata value is replaced with a new one, the metadata lacking a value is assigned one, and the metadata not specified remains unchanged. **REPLACE**: The metadata is replaced with the header included in the current request and the metadata not specified is deleted. This parameter must be used together with **meta**.

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Parameter	Optional or Mandatory	Description
sc	Optional (additional parameter)	The new object storage class Possible values are: • **standard**: The Standard storage class. It features low access latency and high throughput, and is suitable for storing frequently accessed data (multiple times per month on average) or data that is smaller than 1 MB. • **warm**: The Infrequent Access storage class. It is suitable for storing infrequently accessed (less than 12 times per year on average) data, but when needed, the access has to be fast. It has a slightly lower availability than Standard. • **cold**: The Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once per year on average) data. Before changing the storage class of **cold** objects, you must restore them. Otherwise, the change will fail. • **deep-archive**: The Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely accessed (once every few years on average). This storage class costs less than the Archive storage class, but takes longer (usually several hours) to restore data.
acl	Optional (additional parameter)	The predefined access control policy of the object Possible values are: • **private**: Only users granted permissions by the object ACL can access the bucket. • **public-read**: Anyone can read objects in the bucket. • **public-read-write**: Anyone can read, write, or delete objects in the bucket. • **bucket-owner-full-control**: Only the bucket owner has full control over objects in the bucket.

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Parameter	Optional or Mandatory	Description
aclXml	Optional (additional parameter)	The bucket's access control policy, in XML format The format is as follows: <AccessControlPolicy> <Owner> <ID>*ownerid*</ID> </Owner> <AccessControlList> <Grant> <Grantee> <ID>*userid*</ID> </Grantee> <Permission>*[WRITE|WRITE_ACP|READ|READ_ACP|FULL_CONTROL]*</Permission> </Grant> <Grant> <Grantee> <Canned>Everyone</Canned> </Grantee> <Permission>*[WRITE|WRITE_ACP|READ|READ_ACP|FULL_CONTROL]*</Permission> </Grant> </AccessControlList> </AccessControlPolicy> • **Owner**: Optional. It specifies the object owner's ID. • In **AccessControlList**, **Grant** specifies the authorized users. **Grantee** specifies the IDs of authorized users. **Canned** specifies the authorized user group (only **Everyone** is supported currently). • **Permission**: The following permissions can be granted: **WRITE** (write), **WRITE_ACP** (write ACL), **READ** (read), **READ_ACP** (read ACL), and **FULL_CONTROL** (full control). Because angle brackets (<) and (>) are unavoidably included in the parameter value, you must use quotation marks to enclose them for escaping when running the command. Use single quotation marks for Linux and macOS and double quotation marks for Windows.
fs	Optional (additional parameter)	Specifies whether the method of listing parallel file systems is applied. If you are listing parallel file systems, you are recommended to add this parameter. • Listing with this method can be time-consuming because of the nested directory structure. • After this parameter is enabled, **marker** and **limit** will be ignored. Then, the size of the bucket (or parallel file system) or directory will be calculated. • This parameter is only supported for obsutil 5.5.12 or later.

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Parameter	Optional or Mandatory	Description
versionId	Optional when setting properties of a single object (additional parameter)	Version ID of the object whose properties are to be set
fr	Optional when setting properties of a single object (additional parameter)	Generates an operation result list when setting properties of a single object.
f	Optional when setting properties of objects in batches (additional parameter)	Runs in force mode.
r	Mandatory when setting properties of objects in batches (additional parameter)	Sets properties of objects in batches based on a specified object name prefix.
v	Optional when setting properties of objects in batches (additional parameter)	Sets properties of versions of objects in batches based on a specified object name prefix.

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Parameter	Optional or Mandatory	Description
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (possibly success, failure, and warning files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. • A result file should be named as follows: **cp_{succeed | failed | warning}_report**_*time_TaskId*.**txt**. • By default, the maximum size of a single result file is 30 MB. You can set **recordMaxLogSize** in the configuration file to specify the maximum size allowed for a result file. • By default, a result folder can have up to 1,024 result files. You can set **recordBackups** in the configuration file to specify the maximum number allowed for a result folder. • If there are multiple folders and files and you need to confirm the details of a failed task, refer to the failure result file (**cp_failed_report**_*time_TaskId*.**txt**) in the result folder and the **log file** in the log path.
j	Optional when setting properties of objects in batches (additional parameter)	Indicates the maximum number of concurrent tasks for setting object properties in batches. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The tool ensures that the value is at least 1.
config	Optional (additional parameter)	User-defined configuration file for executing a command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK

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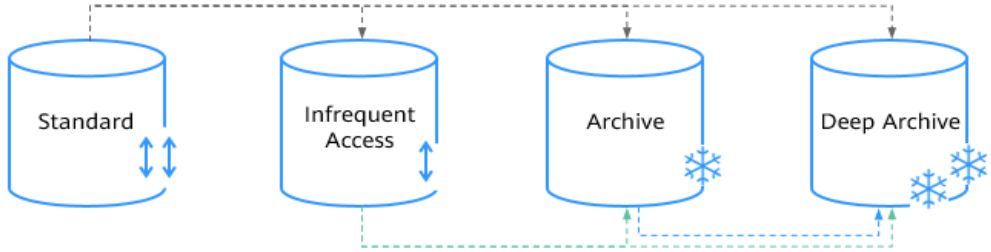
Parameter	Optional or Mandatory	Description
t	Optional (additional parameter)	The user's security token

Transitioning Objects Between Storage Classes Using Lifecycle Rules

You can configure lifecycle rules to automatically transition objects between storage classes, which reduces storage costs. Because multi-AZ redundancy is not supported for Archive and Deep Archive, you cannot use lifecycle rules to transition the storage class of multi-AZ objects to Archive or Deep Archive. For more information, see **Transitioning Object Storage Classes Through Lifecycle Rules**.

If versioning is disabled, the lifecycle of an object starts when it is uploaded. If versioning is enabled, the lifecycle of current starts when it is uploaded. The lifecycle for historical versions of an object starts when they become historical.

Figure 2-7 Transitioning objects between storage classes using lifecycle rules



As shown in the figure, you can configure OBS lifecycle rules to transition objects between storage classes:

- From Standard to Deep Archive, Archive, or Infrequent Access.
- From Infrequent Access to Archive or Deep Archive.
- From Archive to Deep Archive.

  NOTE

  - If the objects are in the Infrequent Access, Deep Archive, or Archive storage class, transitioning them may incur costs for the **minimum storage duration**.

You can use OBS Console, APIs, SDKs, or OBS Browser+ to configure storage classes for buckets at bucket creation.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

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Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Data Management** > **Lifecycle Rules**.

Step 4 Click **Create**. The **Create Lifecycle Rule** dialog box is displayed.

Step 5 Configure parameters under **Basic Information**.

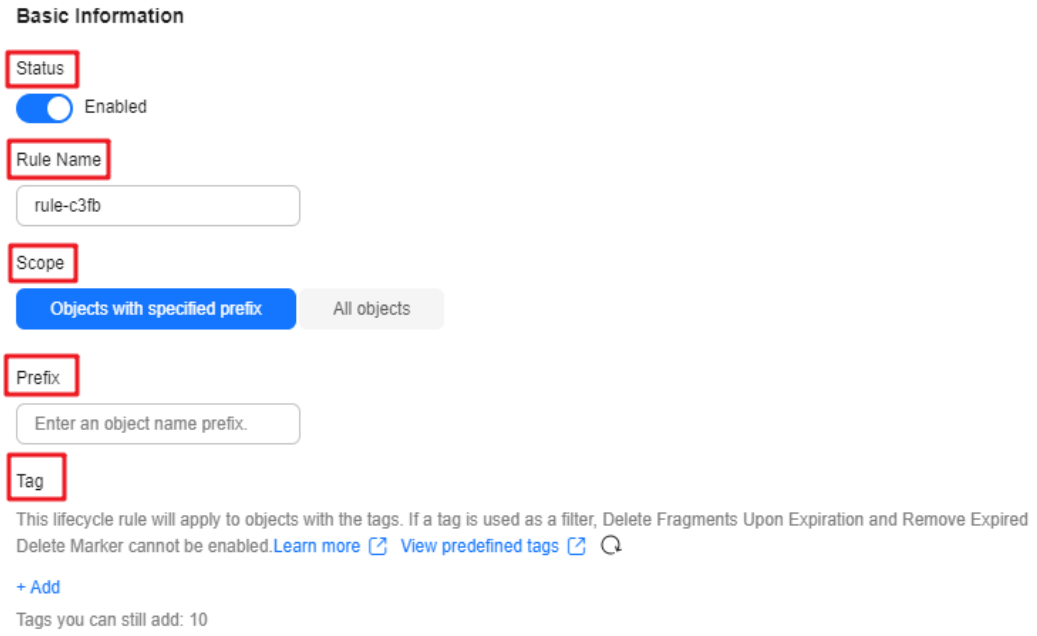

Table 2-8 Parameters under **Basic Information**

Parameter	Description
Status	Whether to enable the lifecycle rule • If **Status** is enabled, the lifecycle rule will be applied to affected objects as scheduled. The actions that can be triggered include storage class transitions, object deletion, fragment deletion, and removal of expired delete markers. • If **Status** is disabled, the lifecycle rule will not be applied.
Rule Name	The name of the lifecycle rule A rule name: • Can be 255 characters long. • Can contain only uppercase letters, lowercase letters, digits, periods (.), underscores (_), and hyphens (-).

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Parameter	Description
Scope	The scope of objects the lifecycle rule applies to • **Objects with specified prefix**: The rule applies to the objects with the specified prefix in the bucket. • **All objects**: The rule applies to all objects in the bucket. Multiple lifecycle rules may overlap. In such cases, the **overlapping must comply with** the **predefined constraints**. Otherwise, **conflicting rules can cause the configuration to fail**.
Prefix	If you choose **Objects with specified prefix** as the scope, you need to specify an object name prefix. The lifecycle rule applies to the objects with the specified prefix. An object name prefix: • Cannot contain the following special characters: **\ : * ? " < > |** • Cannot start with a slash (/). • Cannot have two consecutive slashes (//).
Tag	Optional You can add a tag to make the lifecycle rule apply to the objects with the specified tag. A lifecycle rule can have a maximum of 10 tags configured. Once a tag is used as a filter, **Delete Fragments Upon Expiration** and **Remove Expired Delete Marker** cannot be enabled. For details about how to add tags to objects, see **Adding Tags to an Object**.

Step 6 Configure **Current Version** and **Historical Version** to specify the number of days after which objects are deleted or transitioned to another storage class.

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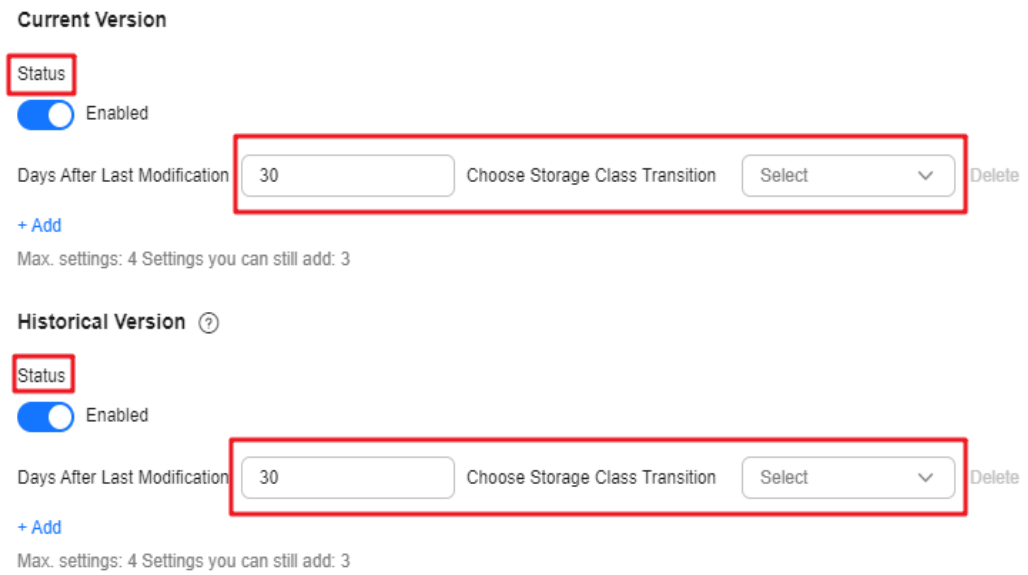

The **Historical Version** appears only when versioning is enabled or suspended for the bucket.

Table 2-9 Settings for **Current Version** and **Historical Version**

Item	Description
Status	Whether to enable the current version or historical version. • With **Status** enabled, you can add **a maximum of four settings**. • With **Status** disabled, you do not need to make any settings.
Infrequent Access	After the specified number of days since the last update, objects that meet the defined conditions will be transitioned to Infrequent Access.
Archive	After the specified number of days since the last update, objects that meet the defined conditions will be transitioned to Archive. • If you want to transition objects first to Infrequent Access and then to Archive, make sure that the number of days before transitioning to Archive is greater than the number of days before transitioning to Infrequent Access. • If you only want to transition objects to Archive, there is no such restriction.

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Item	Description
Deep Archive	After the specified number of days since the last update, objects that meet the defined conditions will be transitioned to Deep Archive. • If you want to transition objects first to Infrequent Access and then to Deep Archive, make sure that the number of days before transitioning to Deep Archive is greater than the number of days before transitioning to Infrequent Access. • If you want to transition objects first to Archive and then to Deep Archive, make sure that the number of days before transitioning to Deep Archive is greater than the number of days before transitioning to Archive. • If you only want to transition objects to Deep Archive, there is no such restriction.
Delete Upon Expiration	After the specified number of days since the last update, OBS will delete the objects that meet the defined conditions. The number of days before performing this action **must be an integer greater than** that specified for any transition. If **versioning is not enabled for the bucket**, specified objects will be permanently deleted once they expire. **The deleted objects cannot be recovered**.

Transitioning the storage class of objects or deleting objects may **incur changes in costs**. The details are as follows:

- Deleting objects frees up storage space. Prices vary depending on storage classes.
- Deep Archive, Archive or Infrequent Access objects have a minimum billable storage duration of 180, 90 or 30 days, respectively. If the objects are deleted or transitioned before this minimum duration is reached, you still need to pay for a full storage duration.
- Transitioning storage classes through lifecycle rules will incur request costs.
- For details about lifecycle rule billing, see **Billing in Special Scenarios**.

NOTE

- **Current Version** and **Historical Version** are two concepts related to **Versioning**. If versioning is enabled for a bucket, uploading objects with the same name to the bucket creates different object versions. The last uploaded object is called the current version, while those previously uploaded are called historical versions. For more information, see **Versioning**.
- You must configure either **Current Version** or **Historical Version**. You can also configure both of them.

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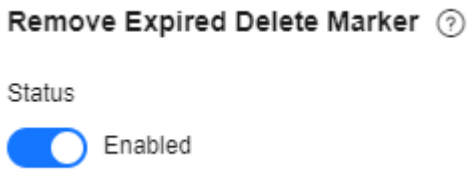
Step 7 Configure **Delete Fragments Upon Expiration** to specify the number of days after which fragments are deleted.

- **Status**: whether to enable **Delete Fragments Upon Expiration**
- You can specify the number of days after which fragments in the bucket will be deleted.

NOTE

Incomplete data in a bucket is called fragments. Fragments are generated during failed upload attempts.

Step 8 Configure **Remove Expired Delete Marker**.



An expired delete marker is the only single delete marker that remains after all historical versions of an object are deleted. This action will remove expired delete markers to improve performance.

Status: whether to remove expired delete markers

Step 9 Select "I have confirmed these lifecycle rule configurations and understand how they may impact my costs."

Step 10 Click **OK** to complete the lifecycle rule configuration.

----End

Using APIs

Configuring Bucket Lifecycle Rules

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

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Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Select the bucket for which you want to configure a lifecycle rule and choose **More** > **Lifecycle Rules**.

Step 3 Click **Create**.

Step 4 Configure related parameters.

Table 2-10 Lifecycle rule parameters

Parameter	Description
Status	Whether to enable the lifecycle rule ● If **Status** is enabled, the lifecycle rule will be applied to affected objects as scheduled. The actions that can be triggered include storage class transitions and object deletion. ● If **Status** is disabled, the lifecycle rule will not be applied.
Rule Name	The name of the lifecycle rule A rule name: ● Can be 255 characters long. ● Can contain only uppercase letters, lowercase letters, digits, periods (.), underscores (_), and hyphens (-).
Applies To	The scope of objects the lifecycle rule applies to ● **Object name prefix**: The rule applies to the objects with the specified prefix in the bucket. ● **Bucket**: The rule applies to all objects in the bucket. Note that the configuration may fail in the following situations: ● If the specified prefix overlaps with the prefix of an existing lifecycle rule, OBS regards these two rules as one and forbids you to configure the one you are configuring. For example, if there is a rule with prefix **abc** in the system, you cannot create another rule whose prefix contains **abc**. ● If there is already a lifecycle rule based on an object prefix, you are not allowed to configure another rule that is applied to the entire bucket. ● If there is a lifecycle rule that can be applied to the entire bucket, you cannot create any rule based on prefix.

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Parameter	Description
Prefix	If you choose **Object name prefix**, you need to specify an object name prefix. The lifecycle rule applies to the objects with the specified prefix. An object name prefix: ● Cannot contain the following special characters: **\ : * ? " < > |** ● Cannot start with a slash (/). ● Cannot have two consecutive slashes (//).
Transition to Infrequent Access	After the specified number of days since the last update, objects that meet the defined conditions will be transitioned to Infrequent Access.
Transition to Archive	After the specified number of days since the last update, objects that meet the defined conditions will be transitioned to Archive. ● If you want to transition objects first to Infrequent Access and then to Archive, make sure that the number of days before transitioning to Archive is greater than the number of days before transitioning to Infrequent Access. ● If you only want to transition objects to Archive, there is no such restriction.
Expiration Time	After the specified number of days since the last update, OBS will delete the objects that meet the defined conditions. The number of days before performing this action **must be an integer greater than** that specified for any transition. If **versioning is not enabled for the bucket**, specified objects will be permanently deleted once they expire. **The deleted objects cannot be recovered**.

An example is given as follows:

Assume you stored the following files in OBS on January 7, 2022:

- log/test1.log
- log/test2.log
- doc/example.doc
- doc/good.txt

On January 10, 2022, you additionally stored the following files in OBS:

- log/clientlog.log
- log/serverlog.log

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- doc/work.doc
- doc/travel.txt

  On January 10, 2022, you configured a lifecycle rule to expire and delete objects with the **log/** prefix one day after their upload. Objects **log/clientlog.log**, **log/serverlog.log**, **log/test1.log**, and **log/test2.log** would be deleted on January 12, 2022.

  If you configure a lifecycle rule to transition objects with the **log** prefix to Infrequent Access and Archive 30 days and 60 days after their upload and to delete the objects 100 days after their upload. OBS performs those actions on **log/clientlog.log**, **log/serverlog.log**, **log/test1.log**, and **log/test2.log** one day after the defined transition periods are reached.

Step 5 Click **OK** to save the lifecycle rule.

----End

Precautions

- **Minimum billable object size**

  Objects smaller than 64 KB are billed as 64 KB.

- **Minimum storage duration**

  This means that objects will be billed for the minimum storage duration even if they are not stored for that long. For example, if an object is transitioned to Archive after being stored in Infrequent Access for 20 days, it will be billed for the storage of 30 days (the minimum storage duration for Infrequent Access).

Item	Standard	Infrequent Access	Archive	Deep Archive (Under Limited Beta Testing)
Minimum storage duration	N/A	30 days	90 days	180 days

- **Object restoration duration**

  Object restoration is required for accessing Archive and Deep Archive objects. The restoration will take some time. If your services require real-time data access, these two storage classes are not recommended.

  Table 2-11 Object restoration duration

Restoration Speed	Duration of Restoration from Archive	Duration of Restoration from Deep Archive
Standard	3 to 5 hours	5 to 12 hours
Expedited	1 to 5 minutes	3 to 5 hours

- **Data restoration billing**

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Table 2-12 Data restoration billing

Operation	Billing Item	Description
Infrequent Access objects	Requests	You are billed for the number of successfully restored objects. If *N* objects were successfully restored, you are billed for *N* requests.
	Data transfer	You are billed for the bandwidth you consumed during data retrievals.
Archive or Deep Archive objects	Requests	You are billed for the number of successfully restored objects. If *N* objects were successfully restored, you are billed for *N* requests.
	Data transfer	You are billed for the bandwidth you consumed during data retrievals.
	Temporary file storage	When an Archive or a Deep Archive object is restored, a copy in the Standard storage class will be generated for the object. That means the object and its Standard copy will co-exist in the bucket. During the validity period of a restoration, you will be billed for the space taken up by both the object and its copy. The copy will be automatically deleted once the validity period ends.

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3 Bucket Management

3.1 Bucket Overview

A bucket is a virtual container used to store **objects** in OBS. OBS offers a flat structure based on buckets and objects. This structure enables all objects to be stored at the same logical layer, rather than being stored hierarchically.

Buckets have their own attributes, such as **storage classes**, access permissions, and **regions**. You can specify access permissions, a storage class, and a region when creating a bucket. You can also configure advanced attributes to fit different storage requirements.

OBS provides the following storage classes: Standard, Infrequent Access, and Archive. With support for these storage classes, OBS caters to diverse storage performance and cost requirements. When creating a bucket, you can specify a storage class for the bucket, which can be changed later.

On OBS, each bucket name must be unique and cannot be changed. The region where a bucket resides cannot be changed once the bucket is created. When you create a bucket, OBS creates a default access control list (ACL) that grants the authorized user permissions for the bucket. Only authorized users can perform operations such as creating, deleting, viewing, and configuring buckets.

An account (including all IAM users under the account) can create a maximum of 100 buckets. You can use the fine-grained access control of OBS to properly plan and use buckets. For example, you can create folders in a bucket based on object prefixes and use **fine-grained permission control** to isolate data between different departments. There is no limit on the number and total size of objects in a bucket.

As OBS is based on a RESTful architecture over HTTP and HTTPS, you can use uniform resource locators (URLs) to locate resources.

Figure 3-1 illustrates the relationship between buckets and objects in OBS.

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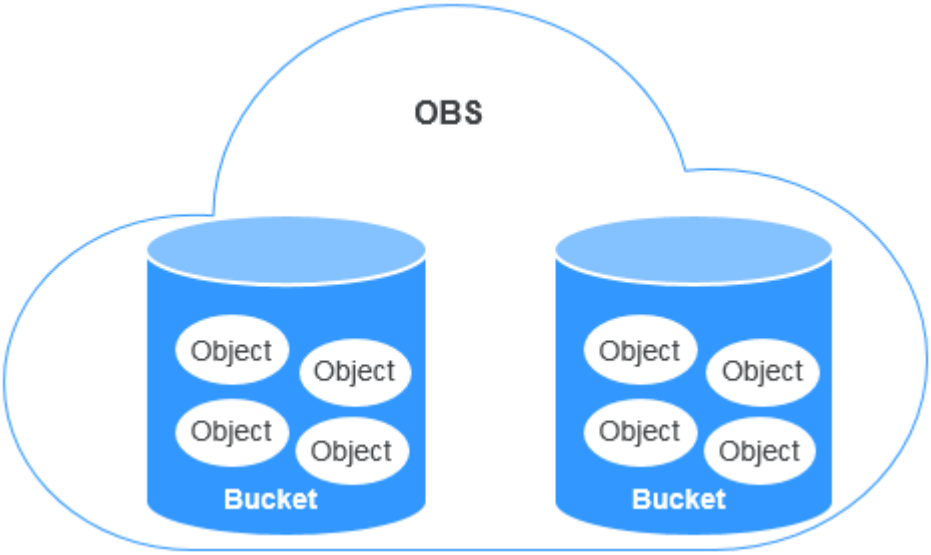
Figure 3-1 Buckets and objects



You can use different methods to **create buckets** based on your use habits and storage needs. After a bucket is created, you can **upload files (data) to the bucket** in a way you like. OBS stores these files as objects. In OBS, buckets and objects are located in different regions, but you can access the same bucket and its resources in a region regardless of the method you choose to access OBS.

3.2 Creating a Bucket

You can use **OBS Console**, SDKs, OBS Browser+, obsutil, or APIs create a bucket. A bucket is a container that stores objects in OBS. Before you can store data in OBS, you must create a bucket.

Prerequisites

You have created an account, have sufficient account balance, and have obtained access keys (AK and SK) and endpoints. For details, see **Getting Started**.

Constraints

- Once a bucket is created, its name and region cannot be changed. Make sure that the bucket name and region you set are appropriate.
- An account (including all of the IAM users under the account) can create a maximum of 100 buckets. You are advised to use the fine-grained access control of OBS to properly plan and use buckets. For example, you can create folders in a bucket based on object prefixes and use **fine-grained access control** to isolate data between departments. There is effectively no limit to the total number or size of objects in a bucket, so data scalability is not a concern.
- OBS buckets are global resources, so each bucket name must be unique across all users, including your own.

  To reuse the name of a deleted bucket for another bucket, you must wait until the bucket name is released. Deleting a bucket via API takes about 30

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minutes. However, the process may take longer if the bucket is not empty, or if the account is in arrears or has been deregistered. OBS cannot guarantee immediate deletion. Therefore, if you attempt to create a new bucket using a name that has not been released, the creation will fail. Similarly, if the name is released but claimed by another user before you reuse it, the creation will also fail.

Bucket Naming Rules

A bucket name is part of the access domain name and needs to be resolved. Therefore, a bucket name must conform to the **DNS domain naming rules**. When receiving a bucket creation request, OBS strictly checks the bucket name. A bucket name:

- Must be unique across all accounts and regions. You must wait at least 30 minutes before you can reuse the name of a deleted bucket or parallel file system.
- Must be 3 to 63 characters long. Only lowercase letters, digits, hyphens (-), and periods (.) are allowed.
- Cannot start or end with a period (.) or hyphen (-), and it cannot contain two consecutive periods (..) or contain a period (.) and a hyphen (-) adjacent to each other.
- Cannot be formatted as an IP address.

Bucket Naming Best Practices

- **Avoid using periods (.) in bucket names**. If a bucket has periods (.) in its name, accessing the bucket domain name (*bucketname*.**obs.***regionID*.**myhuaweicloud.com**) over HTTPS will fail or trigger a certificate verification warning, for example, a red security alert is displayed in the browser. This is because a wildcard SSL certificate only works for buckets without periods (.) in their names.
- Avoid using **sensitive information** in bucket names. A bucket name will be part of the URL of an object in the bucket.
- **Choose a naming rule that can avoid conflicts.** Ensure that your program will select another bucket name when the bucket name has been used.

Ways to Create a Bucket

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to create a bucket.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the upper right corner of the page, click **Create Bucket**.

Step 3 Configure parameters under **General Configuration**.

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Table 3-1 Parameters under **General Configuration**

Parameter	Description
Replicate Settings from Existing Bucket	Optional If you want to reuse the settings of an existing bucket, do as follows to replicate the bucket's settings: Click **Select Bucket**. In the bucket list, select a source bucket. Then, on the **Create Bucket** page, you will see that the source bucket's settings have been replicated to the bucket you are creating. The settings that can be replicated include Region, Data Redundancy Policy, Storage Class, Block Public Access, Bucket Policy, Enterprise Project, Direct Reading, Server-Side Encryption, WORM, and Tag. You can change some or all of the replicated settings later if necessary.
Region	The region where the bucket is created • Once the bucket is created, its region **cannot be changed**. • For lower latency and faster access, select the region nearest to where the data will be accessed. • If your ECS needs to access an OBS bucket over an intranet, ensure that the bucket and the ECS are in the same region. For details, see **Accessing OBS from an ECS over an Intranet**.

Step 4 Configure parameters under **Bucket Settings**.

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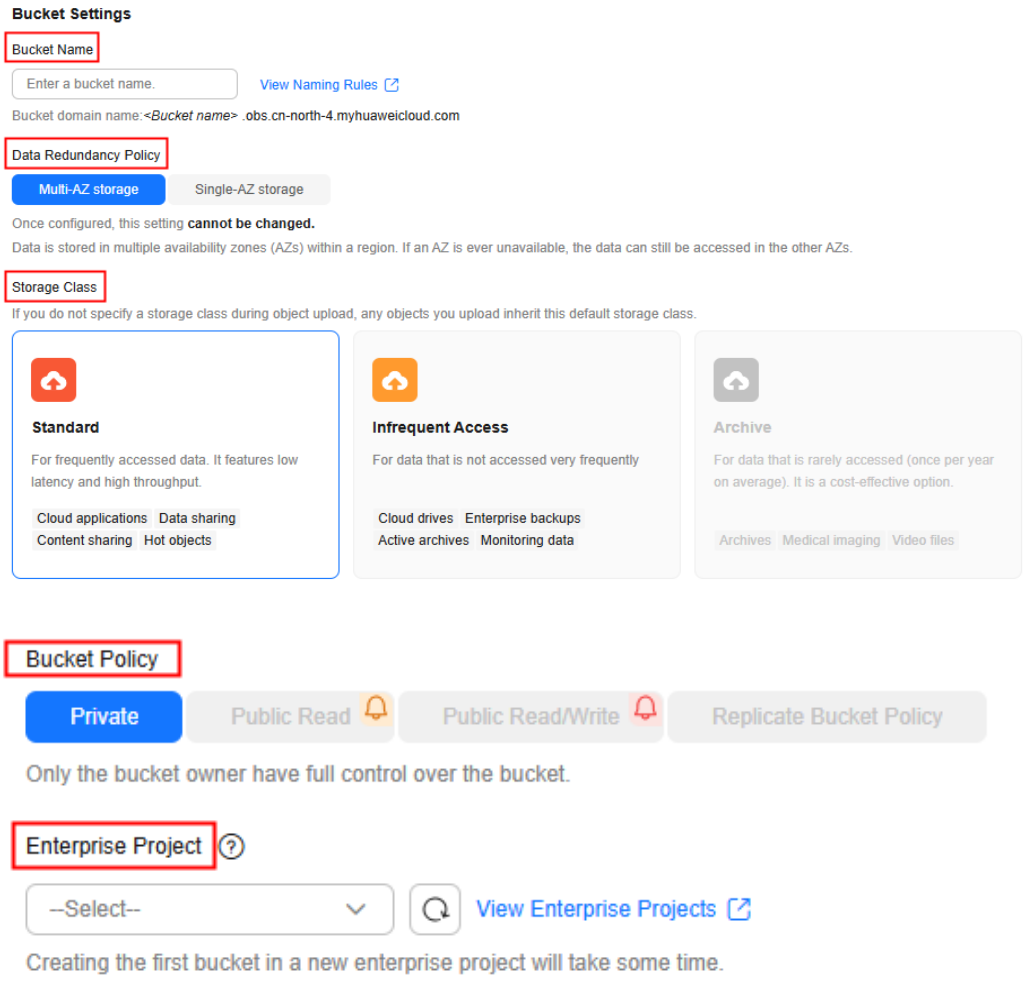

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Table 3-2 Parameters under **Bucket Settings**

Parameter	Description
Bucket Name	When creating a bucket, you need to set a proper bucket name. Once a bucket is created, its name **cannot be changed**. In accordance with the globally applied DNS naming rules, an OBS bucket name: • Must be unique. It cannot be the same as the name of any existing bucket or parallel file system (including those created by others). You must **wait at least 30 minutes before you can reuse the name** of a deleted bucket or parallel file system. • Must be 3 to 63 characters long. • Can contain only lowercase letters, digits, hyphens (-), and periods (.). It cannot start or end with a hyphen (-) or period (.). • Cannot contain two consecutive periods (..) or contain a period (.) and a hyphen (-) adjacent to each other. • Cannot be formatted as an IP address. **NOTE** When you use virtual-hosted-style URLs to access OBS over HTTPS, if the bucket name contains periods (.), the certificate verification will fail. To work around this issue, we recommend that you avoid using periods (.) in bucket names.
Data Redundancy Policy	You can choose to store data in a single AZ or multiple AZs within a region. • **Multi-AZ storage**: Data in the bucket is stored in multiple AZs within a region. If an AZ is ever unavailable, the data can still be accessed in the other AZs. • **Single-AZ storage**: Data in the bucket is stored in a single AZ. This option costs less than the multi-AZ storage. For details about their performance comparison, see **Comparison of Storage Classes**. **Multi-AZ storage** is selected by default. Once a bucket is created, its data redundancy policy **cannot be changed**. If **Multi-AZ storage** is used, the Archive or Deep Archive storage class will become unavailable.

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Parameter	Description
Storage Class	The storage class of the bucket You can choose a storage class that meets your needs for storage performance and costs. • The Standard storage class is for storing a large number of hot files or small files that are frequently accessed (multiple times per month on average) and require fast access. • The Infrequent Access storage class is for storing data that is less frequently accessed (less than 12 times per year on average), but when needed, the access has to be fast. • The Archive storage class is for archiving data that is rarely accessed (once a year on average) and does not require fast access. For more information, see **Storage Class**. **NOTE** The object you upload to the bucket later will inherit the bucket's storage class by default. You can also specify a different storage class for the object.
Block Public Access	Used to centrally set certain levels of public access to buckets. You can use this option to ignore the existing public access permissions or prevent new public access permissions from being created. Enabling all settings prevents the creation of new ACLs or bucket policies that contain public access, and invalidates existing ones. Only the bucket owner can access the bucket and objects within. The following four settings are supported: • **Prevent the creation of ACLs that allow public access.** • **Prevent the creation of bucket policies that allow public access.** • **Ignore ACLs that allow public access.** • **Ignore bucket policies that allow public access.** To block public access, your account must have the **PutBucketPublicAccessBlock** permission. **If your services rely on public access to buckets or objects, blocking public access may interrupt their normal operation. Take care when blocking public access.** Enabling Block Public Access will make the public read and public read/write bucket policies unavailable. For more information, see **Block Public Access**.

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Parameter	Description
Bucket Policy	Controls read and write permissions for the bucket. • **Private**: Only users granted permissions by the bucket ACL can access the bucket. • **Public Read**: Anyone can read objects in the bucket. • **Public Read/Write**: Anyone can read, write, or delete objects in the bucket. If your account does not have permission to create a bucket policy, a private bucket will be created even if you select **Public Read** or **Public Read/Write**. To create a public bucket, your account must have the **obs:bucket:PutBucketPolicy** permission.
Enterprise Project	You can add the bucket to an enterprise project for unified management. To realize this, do as follows: On the enterprise project management page, **create an enterprise object**. Then, create a user group, add users to the user group, and add the user group to the created enterprise project. By doing so, the users obtain the operation permissions for the buckets and objects in the enterprise project. If you do not have any specific needs for enterprise project division and management, choose the **default** enterprise project. • Only an enterprise account can configure enterprise projects. • The OBS user group must have the **OBS Buckets Viewer** and **OBS OperateAccess** permissions for the enterprise project. • Creating the first bucket in a new enterprise project will take about 10 minutes.

Step 5 Configure parameters under **Properties**.

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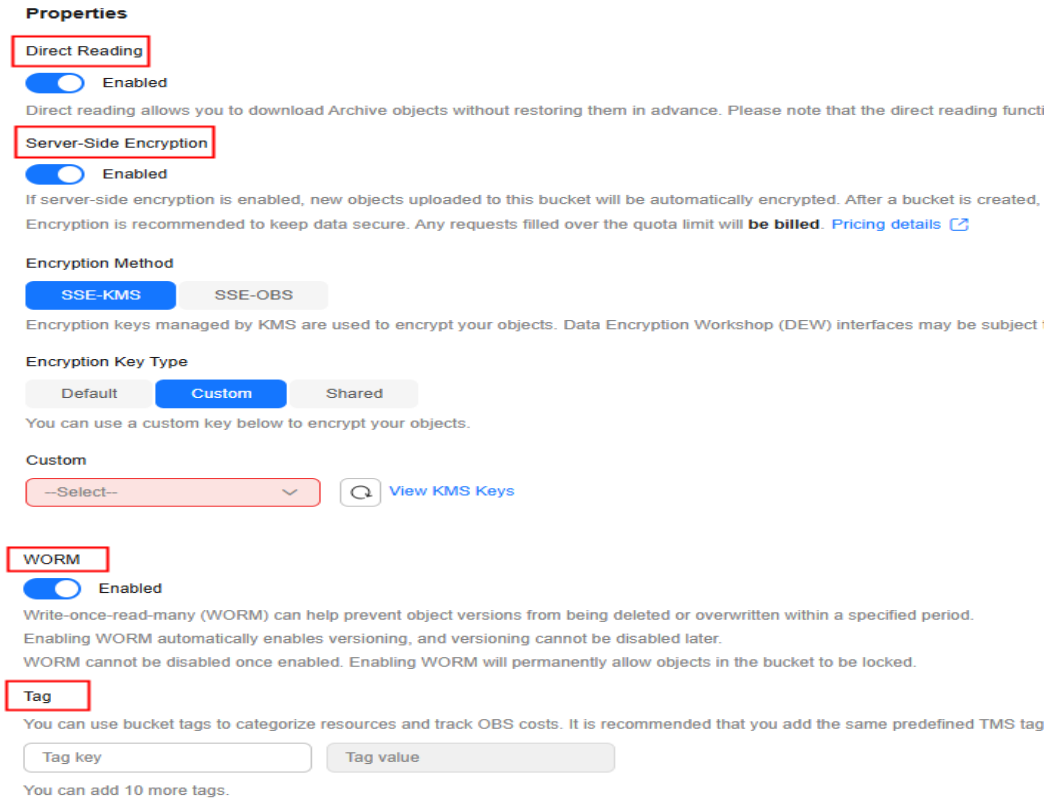

Table 3-3 Parameters under **Properties**

Parameter	Description
Direct Reading	After direct reading is enabled, you can access Archive objects (such as download or share an object or change an object's storage class) without having to restore them first. Direct reading will incur retrieval costs according to the objects' size. For details, see **Data Retrievals**. For more information, see **Direct Reading**.

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Parameter	Description
Server-Side Encryption	After server-side encryption is enabled, new objects uploaded to the bucket will be encrypted. With the encryption enabled, you can choose a required encryption method: • **SSE-KMS**: The encryption key managed in Data Encryption Workshop (DEW) is used to encrypt objects in your bucket. After choosing **SSE-KMS**, you need to specify an encryption key type: – **Default**: The default key in the current region will be used to encrypt the objects uploaded to the bucket. If no default key is available, OBS will create one the first time you upload an object. – **Custom**: Your custom key will be used to encrypt the objects uploaded to the bucket. If you do not have a custom key, click **View KMS Keys** to go to the Data Encryption Workshop (DEW) page and create one. Then, choose the created KMS key from the custom key drop-down list. – **Shared**: A shared key will be used to encrypt the objects uploaded to the bucket. You need to enter the ID of the shared key. To obtain a shared key ID, see **Viewing Key Details**. **NOTE** A shared key from **a project or a subproject** can be configured here. However, if a shared key from a subproject is specified, the owner of the shared key cannot access objects encrypted with that key, but the bucket owner can. Data Encryption Workshop (DEW) APIs have traffic control limits (see **DEW API Overview**). After SSE-KMS is used, your service access may be affected by traffic control. If SSE-KMS is used, you will be billed for what you use beyond the free quota given by KMS. For details, see **DEW Billing Items**. • **SSE-OBS**: The key created and managed by OBS will be used to encrypt the objects uploaded to the bucket. After you enable server-side encryption for the bucket, any object you upload to it will inherit the encryption settings from the bucket by default. You can also separately configure encryption for the object. For more information, see **Server-Side Encryption Overview**.

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Parameter	Description
WORM	You can enable write-once-read-many (WORM) to help prevent object versions from being deleted or overwritten within a specified period. • WORM cannot be disabled once enabled. However, you can choose whether to configure a retention policy to control whether objects can be written or deleted. • Enabling WORM automatically enables versioning, and versioning cannot be disabled later. • A bucket with WORM enabled does not support cross-region replication, and any existing cross-region replication rules applied to the bucket will become invalid. For more information, see **Configuring WORM to Protect Objects from Being Overwritten or Deleted**.
Tag	Optional. You can add tags to organize and manage buckets. You can customize a tag or choose one predefined on TMS. A tag is a key-value pair. • Tags associated with a bucket must have unique tag keys. A tag key: – Must contain 1 to 36 characters and be case sensitive. – Cannot start or end with a space or contain the following characters: ,/|<>=*\ • Tag values can be duplicate and can be left blank. A tag value: – Can contain 0 to 43 characters and must be case sensitive. – Cannot contain the following characters: ,/|<>=*\ A bucket can have up to 10 tags. Each tag has only one key and one value. For more information, see **Adding Tags to a Bucket**.

Step 6 Click **Create Now**.

----End

Using APIs

Creating a Bucket

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Using SDKs

Java	Python	C	Go	BrowserJS: not supported	.NET	Android	iOS	PHP	Node.js

Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 In the upper part of the page, click **Create Bucket**.

Step 3 In the displayed dialog box, configure bucket parameters, as shown in **Figure 3-2**.

Figure 3-2 Creating a bucket

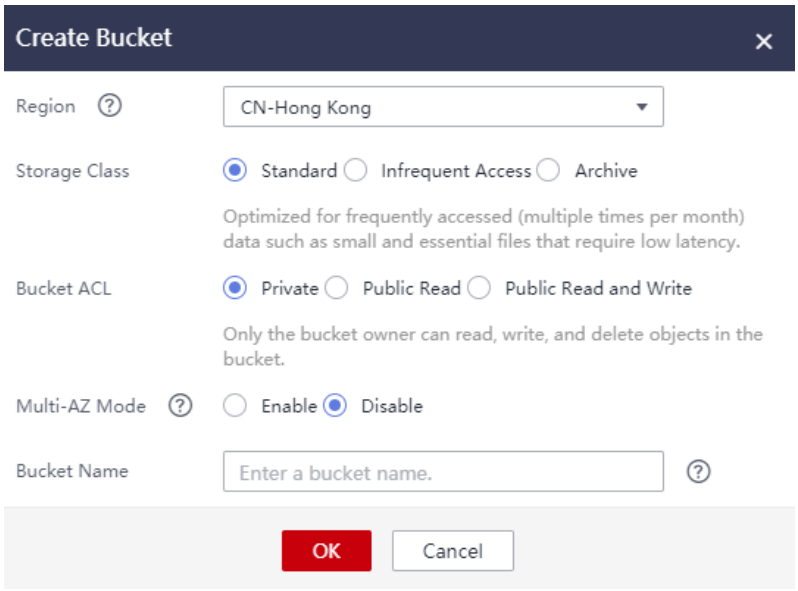

Table 3-4 Bucket creation parameters

Parameter	Description
Region	Enter the region where you want to create a bucket. • **Once the bucket is created, its region cannot be changed.** • For lower latency and faster access, create a bucket in the region nearest to you. • If you want your bucket to be accessed from an ECS over the intranet, ensure that the bucket and the ECS are in the same region. For details, see **Accessing OBS from an ECS over the Intranet**.

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Parameter	Description
Storage Class	Storage class of the bucket. Different storage classes meet customers' needs for storage performance and costs. • **Standard**: applicable to scenarios where a large number of hot files or small files need to be accessed frequently (multiple times per month on average) and require fast access response. • **Infrequent Access**: ideal for storing data that is not frequently accessed (less than 12 times per year on average) but requires fast access response. • **Archive**: suitable for archiving data that is rarely accessed (averagely once a year) and has no requirements for quick response. **NOTE** During the object upload, an object inherits its bucket's storage class by default, and you can also specify a different storage class for the object. For more information, see **Storage Class**.
Bucket ACL	Controls read and write permissions on buckets. • **Private**: Only users granted permissions by the ACL can access the bucket. • **Public Read**: Anyone can read objects in the bucket. • **Public Read and Write**: Anyone can read, write, or delete objects in the bucket.
Multi-AZ Mode	If multi-AZ storage is enabled, data in your bucket is stored in multiple AZs within a region. **After a bucket is created, its data redundancy policy cannot be changed.**

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Parameter	Description
Bucket Name	Name of the bucket you want to create, which must be globally unique. A bucket name: • Must be 3 to 63 characters long and start with a digit or letter. Only lowercase letters, digits, hyphens (-), and periods (.) are allowed. • Cannot be formatted as an IP address. • Cannot start or end with a hyphen (-) or period (.). • Cannot contain two consecutive periods (..), for example, **my..bucket**. • Cannot contain a period (.) and a hyphen (-) adjacent to each other, for example, **my-.bucket** or **my.-bucket**. **After a bucket is created, its name cannot be changed.** A user can create a maximum of 100 buckets in OBS. **NOTE** • You can click next to the **Bucket Name** text box to view the bucket naming rules. • When a URL is used to access a bucket, the bucket name will become part of the URL. According to the DNS rule, URLs do not support uppercase letters and cannot recognize buckets whose name contains uppercase letters. Therefore, a bucket name can contain only lowercase letters, digits, hyphens (-), and periods (.). For example, if you attempt to access bucket **MyBucket** using a URL, the URL will parse **MyBucket** as **mybucket**. This results in an access error. • DNS naming rules can standardize bucket names globally, facilitating the resolution during bucket access. With the DNS naming rules used, you can benefit from new functions and optimized features, and configure static website hosting for buckets.

Step 4 Click **OK**. If the bucket is successfully created, it is displayed in the bucket list. If the creation fails, an error message will be displayed.

----End

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
```
obsutil mb obs://bucket [-fs] [-az=xxx] [-acl=xxx] [-sc=xxx] [-location=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```
- In Linux or macOS
```
./obsutil mb obs://bucket [-fs] [-az=xxx] [-acl=xxx] [-sc=xxx] [-location=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

Examples

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- Take the Windows OS as an example. Run the **obsutil mb obs://bucket-test** command to create a bucket. The creation is successful.

```
obsutil mb obs://bucket-test
Start at 2024-09-29 07:52:11.3769487 +0000 UTC

Create bucket [bucket-test] successfully, request id [000001923CC401864018BA75753D2D5F]
```

- Take the Windows OS as an example. Run the **obsutil mb obs://bucket001** command to create a bucket with the same name as the bucket of another account. The creation fails.

```
obsutil mb obs://bucket001
Start at 2024-09-30 07:03:50.1378331 +0000 UTC

Create bucket [bucket001] failed, status [409], error code [BucketAlreadyExists], error message [The requested bucket name is not available. The bucket namespace is shared by all users of the system. Please select a different name and try again.], request id [0000019241BE18DB4019EDD66E135C56]
```

Parameter Description

Parameter	Optional or Mandatory	Description
bucket	Mandatory	The bucket name A bucket name must comply with the following rules: ● Contains 3 to 63 characters, including lowercase letters, digits, hyphens (-), and periods (.), and starts with a digit or letter. ● Cannot be an IP address. ● Cannot start or end with a hyphen (-) or period (.). ● Cannot contain two consecutive periods (.), for example, **my..bucket**. ● Cannot contain periods (.) and hyphens (-) adjacent to each other, for example, **my-.bucket** or **my.-bucket**.
fs	Optional (additional parameter)	Creates a parallel file system.
az	Optional (additional parameter)	The data redundancy policy that can be specified for a bucket to store data in a single AZ or multiple AZs in the same region The value is **multi-az**. If **multi-az** is used, a bucket with multi-AZ storage will be created. If this parameter is not included, a bucket with single-AZ storage will be created.

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Parameter	Optional or Mandatory	Description
acl	Optional (additional parameter)	The access control policy that can be specified when creating a bucket Possible values are: • **private**: Only users granted permissions by the bucket ACL can access the bucket. • **public-read**: Anyone can read objects in the bucket. • **public-read-write**: Anyone can read, write, or delete objects in the bucket.
sc	Optional (additional parameter)	The storage class of the bucket Different storage classes meet customers' needs for storage performance and costs. Possible values are: • **standard**: Standard storage class. It features low access latency and high throughput, and is applicable to storing frequently accessed data (multiple accesses per month) or data that is smaller than 1 MB. • **warm**: Infrequent Access storage class. It is ideal for storing infrequently accessed (less than 12 times a year) data, but when needed, the access has to be fast. • **cold**: Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once a year) data. • **deep-archive**: Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely (once every few years) accessed. This storage class costs less than the Archive storage class, but takes longer time (usually several hours) to restore data.

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Parameter	Optional or Mandatory	Description
location	Mandatory unless the requested OBS region is the default one (additional parameter)	The region where the bucket resides To view the currently valid regions, see **Regions and Endpoints**. • **Once the bucket is created, its region cannot be changed.** • For lower latency and faster access, select the region nearest to where the data will be accessed. • If you want your bucket to be accessed from an ECS over the intranet, ensure that the bucket and the ECS are in the same region. For details, see **Accessing OBS from an ECS over the Intranet**. **NOTE** This parameter indicates the region where a bucket will be created. It is mandatory only when the endpoint belongs to any other regions than the default one CN North-Beijing1 (cn-north-1).
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

References

Changing the Bucket Storage Class

After the bucket is created, you can change its storage class by performing the following steps: For details, see **Configuring a Storage Class** and **Changing the Storage Class of a Bucket or Object**.

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Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, locate the bucket you want and click **Change Storage Class** on the right.

Step 3 Select the desired storage class and click **OK**.

NOTE

- Changing the storage class of a bucket does not change the storage class of existing objects in the bucket.
- If you do not specify a storage class for an object when uploading it, it inherits the bucket's storage class by default. After the bucket's storage class is changed, newly uploaded objects will inherit the new storage class of the bucket by default.

----End

Accessing a Bucket

After a bucket is created, you are advised to bind a **user-defined domain name** to it. You can then use the domain name to access the bucket.

NOTE

To protect your services from being affected by the takeover of Huawei Cloud public domain names by relevant organizations, you are advised to use a user-defined domain name to access a bucket.

You can also access a bucket by using its own domain name. The structure and an example of a bucket domain name are given as follows:

[Structure] *BucketName*.*Endpoint*

[Example] *bucketname*.**obs.ap-southeast-1.myhuaweicloud.com**

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to access buckets.

Causes of Bucket Creation Failures and Solutions

Why Am I Unable to Create a Bucket?

More FAQs

The following lists questions frequently asked about buckets:

- **Why Can't I Delete a Bucket?**
- **Can I Change the Region of a Bucket?**
- **How Do I Change the Enterprise Project Where My Bucket Belongs?**
- **Can I Copy a File Between Buckets?**
- **Can I Move a File Between Buckets?**
- **Can I Batch Delete Objects or Empty a Bucket in OBS?**
- **How Do I Query the Size of a Folder in a Bucket?**

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3.3 Replicating Settings from an Existing Bucket

Scenarios

You can replicate the settings of an existing bucket to the bucket you are creating.

The following configurations can be replicated:

- Bucket policies
- CORS rules
- Lifecycle rules
- Back-to-source rules
- Image processing styles
- Online decompression rules

Constraints

- The configurations replicated from a source bucket will not overwrite existing configurations in the destination bucket, and any that conflict with the existing ones will not be replicated.
- The version of both the source and destination buckets must be 3.0.
- For functions available for both buckets and parallel file systems, function configurations can be replicated from buckets to parallel file systems and vice versa.

Ways to Replicate Settings from an Existing Bucket

You can use OBS Console to replicate existing settings from an existing bucket.

Using OBS Console

- **Replicating Bucket Policies**
- **Replicating CORS Rules**
- **Replicating Lifecycle Rules**
- **Replicating Back-to-Source Rules**
- **Replicating Image Styles**
- **Replicating Online Decompression Policies**

3.4 Listing Buckets

You can list all created buckets to view their information.

Important Notes

By default, bucket listing requests are happened in the CN North-Beijing1 region. Therefore, the **expenditures** for ListAllMyBucketsOperation requests are included in this region.

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Ways to List Buckets

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to list buckets.

Using OBS Console

Step 1 Log in to **OBS Console**.

Step 2 Go to the bucket list page, which displays all buckets under your account.

----End

Using APIs

Listing Buckets

Using SDKs

Java	Python	C	Go	BrowserJS: not supported	.NET	Android	iOS	PHP	Node.js

Using the GUI Tool - OBS Browser+

Log in to OBS Browser+. All buckets under your account are displayed in the bucket list.

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
  ```
  obsutil ls [-s] [-fs] [-sc] [-du] [-fs] [-j=1] [-limit=1] [-format=default] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
  ```
- In Linux or macOS
  ```
  ./obsutil ls [-s] [-fs] [-sc] [-du] [-fs] [-j=1] [-limit=1] [-format=default] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
  ```

Examples

- Take the Windows OS as an example. Run the **obsutil ls -limit=5** command to obtain the bucket list.
  ```
  obsutil ls -limit=5
  Start at 2024-09-29 07:58:46.0506904 +0000 UTC

  Bucket                  CreationDate                Location        BucketType
  obs://bucket001         2018-09-03T01:53:02Z        example         OBJECT

  obs://bucket002         2018-11-01T01:40:01Z        example         OBJECT

  obs://bucket003         2018-10-25T11:45:45Z        example         OBJECT

  obs://bucket004         2018-10-26T02:33:09Z        example         OBJECT
  ```

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```
obs://bucket005             2018-10-26T02:34:50Z        example        OBJECT

Bucket number : 5
```

Parameter Description

Parameter	Optional or Mandatory	Description
s	Optional (additional parameter)	Displays simplified query result. **NOTE** In the simplified format, the returned result contains only the bucket name.
sc	Optional (additional parameter)	Queries the storage classes of the buckets when listing buckets.
j	Optional (additional parameter). It must be used together with **sc**.	The maximum number of concurrent tasks for querying the bucket storage class. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.
du	Optional (additional parameter)	Quickly returns the total size of listed objects, without displaying detailed object information. This parameter can be used together with other parameters. **NOTE** This parameter takes effect only on listing objects, but not on listing buckets.
fs	Optional (additional parameter)	Whether the method of listing parallel file systems is applied. If you are listing parallel file systems, you are recommended to add this parameter. **CAUTION** • With this method, the listing time required varies largely depending on the directory structures. • After this parameter is enabled, **marker** and **limit** will be ignored. Then, the size of the bucket, parallel file system, or directory will be calculated. • This parameter is only supported by obsutil 5.5.12 and later.
limit	Optional (additional parameter)	The maximum number of buckets that can be queried. If the value is less than 0, all buckets are listed. If it is left blank, a maximum of 1000 buckets can be listed by default.

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Parameter	Optional or Mandatory	Description
format	Optional (additional parameter)	Prints a listing result in the user-defined format. Currently, the value can only be **default**, indicating that the listing result is displayed in one row.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

NOTE

In a bucket listing result, **BucketType** indicates the bucket type. **OBJECT** indicates an object storage bucket, while **POSIX** indicates a parallel file system.

3.5 Viewing Bucket Information

After creating a bucket on **OBS Console**, you can view its details, including basic bucket information, usage statistics, alarms, domain name details, basic configurations, FAQs, and others. You can also export all buckets of the current account and view their basic information in the exported Excel file.

Ways to View Bucket Information

You can use **OBS Console**, SDKs, OBS Browser+, obsutil, or APIs to view a the information of a bucket.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list of **OBS Console**, click the desired bucket to go to the **Objects** page.

Step 3 In the navigation pane, choose **Overview**.

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Step 4 In the **Usage Statistics** area, view information about the storage, traffic, request, and month-over-month growth of the bucket. Click **View Usage Analysis** in the upper right corner to go to the **Metrics** page and view details.

Figure 3-3 Bucket usage statistics

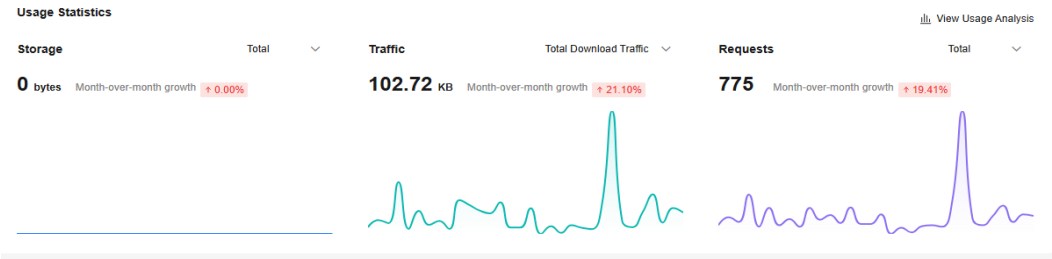

Table 3-5 Bucket usage metrics

Parameter	Description
Storage	Measures the storage occupied by all objects, Standard objects, Infrequent Access objects, Deep Archive, and Archive objects in the bucket.
Traffic	**Total Download Traffic**: It measures the total download traffic for the bucket in the last 30 days. Both intranet and Internet traffic are covered.
	Download Traffic (Intranet): It measures the total intranet download traffic for the bucket in the last 30 days.
	Download Traffic (Internet): It measures the total Internet download traffic for the bucket in the last 30 days.
	Total Upload Traffic: It measures the total upload traffic for the bucket in the last 30 days. Both intranet and Internet traffic are covered.
	Upload Traffic (Intranet): It measures the total intranet upload traffic for the bucket in the last 30 days.
	Upload Traffic (Internet): It measures the total Internet upload traffic for the bucket in the last 30 days.
Requests	**Total**: It measures the total number of requests (including PUT, POST, COPY, LIST, GET, HEAD, and DELETE requests) made for the bucket and the objects in it in the last 30 days.
	GET: It measures the total number of GET and HEAD requests made for the bucket and the objects in it in the last 30 days.

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Parameter	Description
	PUT: It measures the total number of PUT, POST, COPY, and LIST requests made for the bucket and the objects in it in the last 30 days.
	DELETE: It measures the total number of DELETE requests made for the bucket and the objects in it in the last 30 days.
Month-over-month growth	It compares the current month's data with the previous month's data, showing the data increase or decrease. Take the comparison between January 2023 and February 2023 as an example. Month-over-month (MoM) growth = (Current month's data – Previous month's data)/Previous month's data x 100% Suppose the Standard storage in January was 60 MB and that in February was 120 MB, the MoM growth was calculated as follows: (120 – 60) ÷ 60 x 100% = 100%. This means that the standard storage in February was double that of January.

NOTE

The data is not displayed in real time. There may be approximately one hour delay.

To view the number of requests and traffic statistics, you must have the **CES ReadOnlyAccess** permission or a higher Cloud Eye permission for the region where the bucket is located.

Usage Statistics is only available for buckets that support usage analysis.

Step 5 In the **Alarms** area, view the alarm severities and the alarm number of each severity. By clicking **Alarm Details**, you can explore more on the **Alarm Records** page of Cloud Eye.

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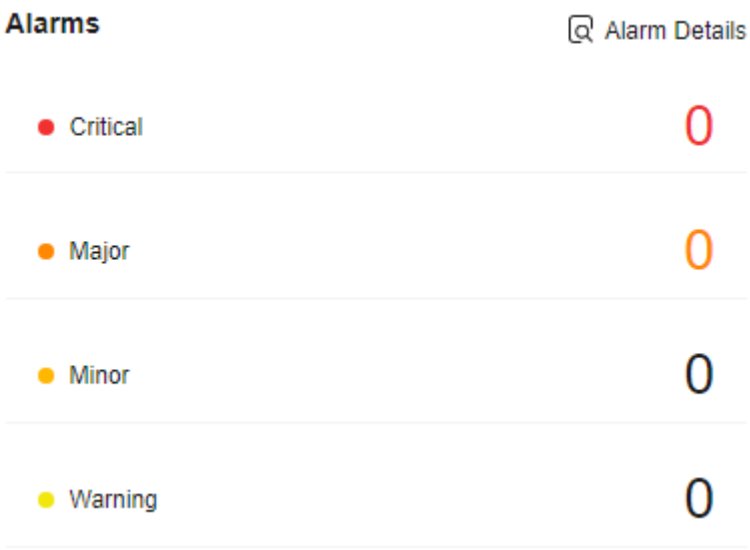
Figure 3-4 Information about bucket alarms

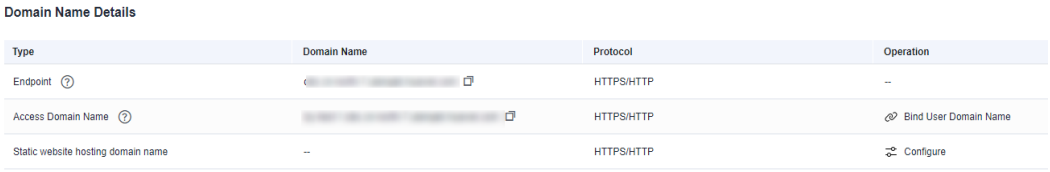


NOTE

Alarms is only available for buckets that support usage analysis.

Step 6 In the **Domain Name Details** area, view information about the endpoint, access domain name, and static website hosting domain name. You can also perform related operations by clicking buttons in the **Operation** column.

Figure 3-5 Domain name details of the bucket



Step 7 In the **Basic Information** area, view the bucket's basic information, including number of objects, bucket version, cluster type, enterprise project, and account ID.

Figure 3-6 Bucket's basic information

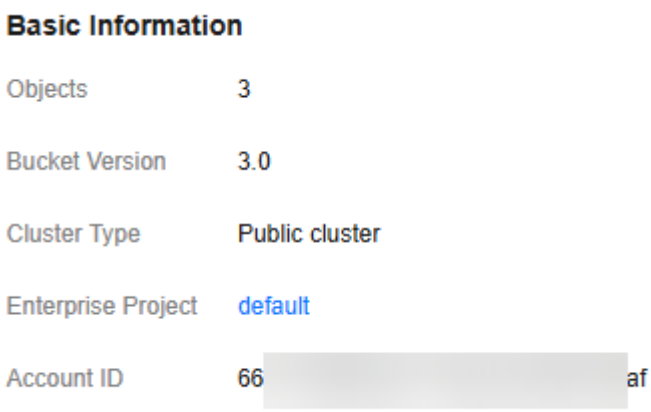


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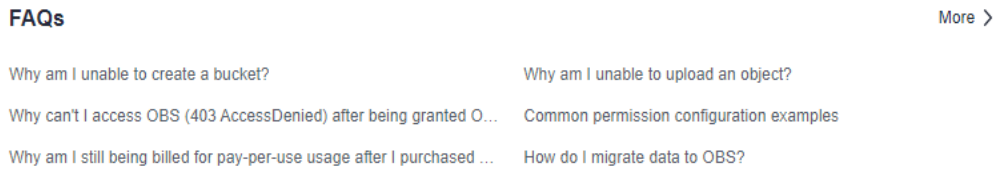
Table 3-6 Parameters in the Basic Information area

Parameter	Description
Objects	The total number of stored folders and objects of all versions in a bucket
Bucket Version	Version number of the bucket. **3.0** indicates the latest bucket version, and **--** indicates versions earlier than 3.0.
Cluster Type	Cluster where the bucket is located
Enterprise Project	Enterprise project that a bucket belongs to
Account ID	Unique identity of the bucket owner. It is the same as **Account ID** on the **My Credentials** page.

Step 8 In the **FAQs** area, view bucket-related FAQs. You can click **More** in the upper right corner to view more FAQs.

Figure 3-7 Bucket FAQs



Step 9 In the **Learn More** area, choose to view best practices or usage guide.

Figure 3-8 Learn More

----End

Using APIs

Obtaining Bucket Metadata

Using SDKs

Java	Python	C: not supported	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

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Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Right-click the bucket you want to view and choose **Basic Information** from the shortcut menu.

Step 3 In the displayed **Basic Information** window, view your required information, as shown in **Figure 3-9**.

Figure 3-9 Bucket's basic information

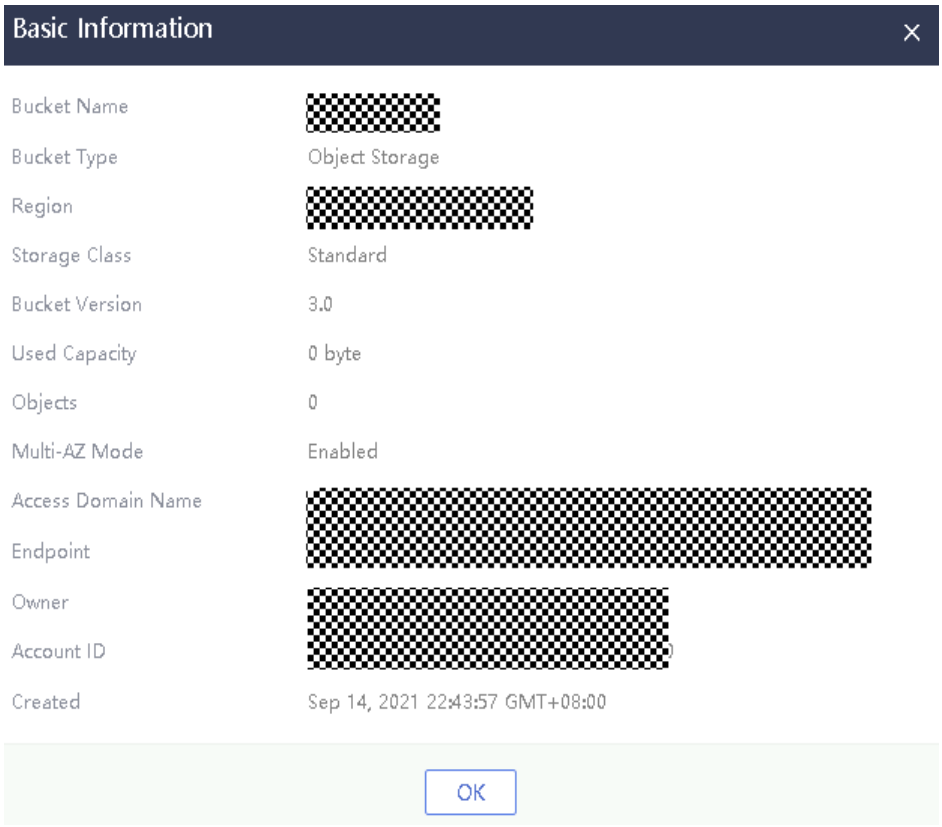

Table 3-7 Parameter description

Parameter	Description
Bucket Name	Name of the bucket.
Bucket Type	Object storage or a parallel file system.
Region	Region where the bucket is located.
Storage Class	Storage class of the bucket. It can be **Standard**, **Infrequent Access**, or **Archive**.
Bucket Version	Version number of the bucket.
Used Capacity	Total capacity used by objects in the bucket.

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Parameter	Description
Objects	Number of objects in the bucket.
Multi-AZ Mode	Status of the multi-AZ function. If multi-AZ is enabled, data will be stored in multiple AZs.
Account ID	Unique identity of the bucket owner. It is the same as **Account ID** on the **My Credentials** page.
Created	Time when the bucket was created.

----End

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
  ```
  obsutil stat obs://bucket [-acl] [-bf=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
  ```
- In Linux or macOS
  ```
  ./obsutil stat obs://bucket [-acl] [-bf=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
  ```

Examples

- Take the Windows OS as an example. Run the **obsutil stat obs://bucket-test** command to query the basic properties of bucket **bucket-test**.
  ```
  obsutil stat obs://bucket-test

  Start at 2024-09-29 07:58:46.0506904 +0000 UTC

  Bucket:
    obs://bucket-test
  StorageClass:
    standard

  ObsVersion:
    3.0
  AvailableZone:
    multi-az
  BucketType:
    OBJECTObjectNumber:
    8005
  Size:
    320076506
  Quota:
    0
  ```

Parameter Description

Parameter	Optional or Mandatory	Description
s	Optional (additional parameter)	Displays simplified query result. **NOTE** In the simplified format, the returned result contains only the bucket name.
sc	Optional (additional parameter)	Queries the storage classes of the buckets when listing buckets.

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Parameter	Optional or Mandatory	Description
j	Optional (additional parameter). It must be used together with **sc**.	The maximum number of concurrent tasks for querying the bucket storage class. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.
du	Optional (additional parameter)	Quickly returns the total size of listed objects, without displaying detailed object information. This parameter can be used together with other parameters. **NOTE** This parameter takes effect only on listing objects, but not on listing buckets.
fs	Optional (additional parameter)	Whether the method of listing parallel file systems is applied. If you are listing parallel file systems, you are recommended to add this parameter. **CAUTION** • With this method, the listing time required varies largely depending on the directory structures. • After this parameter is enabled, **marker** and **limit** will be ignored. Then, the size of the bucket, parallel file system, or directory will be calculated. • This parameter is only supported by obsutil 5.5.12 and later.
limit	Optional (additional parameter)	The maximum number of buckets that can be queried. If the value is less than 0, all buckets are listed. If it is left blank, a maximum of 1000 buckets can be listed by default.
format	Optional (additional parameter)	Prints a listing result in the user-defined format. Currently, the value can only be **default**, indicating that the listing result is displayed in one row.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.

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Parameter	Optional or Mandatory	Description
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

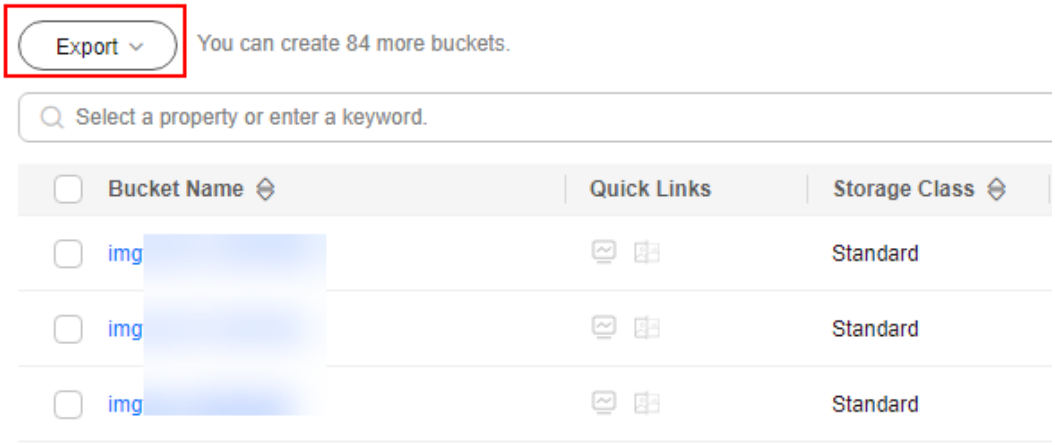
Related Operations

Exporting a Bucket List

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

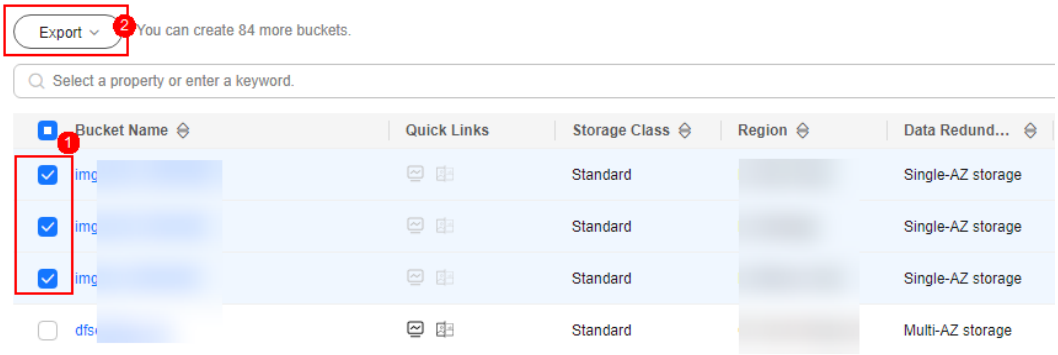
Step 2 Click **Export** in the upper left corner of the bucket list to export all buckets.

Figure 3-10 Exporting all buckets



Step 3 Select the buckets to be exported and click **Export** in the upper left corner of the bucket list.

Figure 3-11 Exporting the selected buckets



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Step 4 Obtain the bucket list in Excel, which is automatically downloaded to your local computer.

The file lists all the buckets of the current account and includes the following information: bucket name, storage class, region, data redundancy policy, used capacity, bucket version, enterprise project, and bucket creation time.

----End

3.6 Managing Bucket Quotas

Scenarios

By default, neither the entire OBS system nor any single bucket has limits on storage capacity or the number of objects that can be stored. You can set a quota for a bucket to limit the total size of objects that can be uploaded to the bucket. If the total object size reaches the upper limit, object uploads will fail.

A bucket quota can control object uploading only after the quota is set. If the bucket quota is less than the capacity of the uploaded objects, the existing objects will not be deleted, but new objects cannot be uploaded. In this case, you can upload new objects only after deleting some existing objects until the used storage capacity is less than the quota limit.

NOTE

- A bucket quota must be a non-negative integer, in bytes. The maximum value is $2^{63} - 1$.
- OBS does not provide an API for deleting bucket quotas. You can set the bucket quota to 0 to cancel the quota limit.

Ways to Manage Bucket Quotas

You can use APIs or SDKs to manage bucket quotas.

Using APIs

Configuring Bucket Storage Quota

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

3.7 Viewing Bucket Usage Statistics

On **OBS Console**, you can view the storage, traffic, and requests of a single bucket.

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NOTE

To view usage, you need to configure the **ces:metricData:list** policy in a regional project. For details, see **Cloud Eye Custom Policies**.

Scenarios

OBS provides the monitoring for the items described in **Table 3-8**.

Table 3-8 Metric description

Category	Item	Description
Storage	Usage (Total)	Measures the total storage capacity occupied by all objects and the object quantity in a bucket.
	Usage (By Class)	Measures the storage capacity occupied by objects in Standard, Infrequent Access, and Archive storage classes in a bucket. For more information about storage classes, see **Storage Classes**.
	Objects (By Class)	Measures the number of objects in Standard, Infrequent Access, and Archive storage classes in a bucket. For more information about storage classes, see **Storage Classes**.
Traffic	Traffic	Measures the inbound and outbound traffic.
Requests	TPS	Measures the total transactions per second (TPS) and average request latency.
	Requests	Measures the number of GET, PUT, and DELETE requests and total number of all requests.
	Percentage	Measures the percentage of successful, valid, and interrupted requests.
	Status Codes	Measures the distribution of status codes returned by the server. For more information about different status codes, see **Status Codes**.

Constraints

Data on the **Metrics** page is not updated in real time. Storage data has a latency of about 1 hour, while traffic and request data have a latency of about 5 minutes.

Viewing Metrics

On the **Metrics** page, you can view the storage, traffic, and requests of a single bucket.

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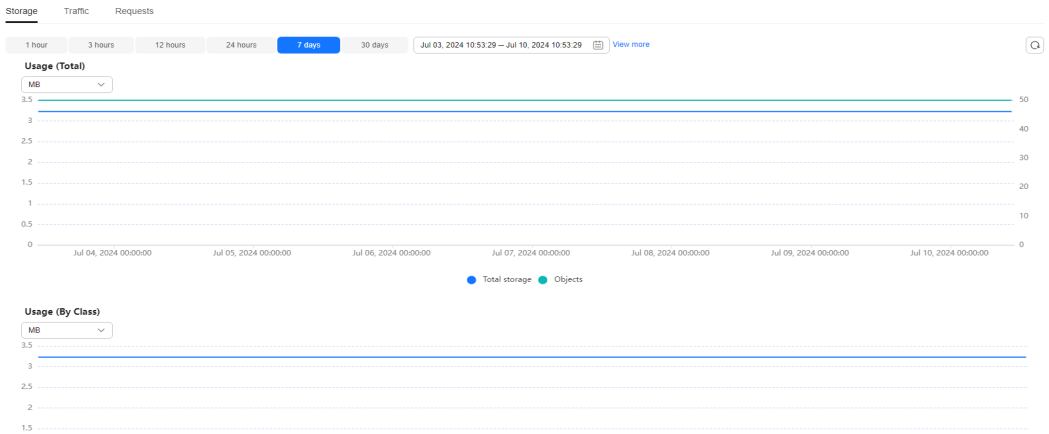
Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Metrics**.

Step 4 Select a metric type and a period to view related statistics,

Figure 3-12 Viewing metrics



In the chart, you can:

- Choose one or more legends to display what you want to view.
- Move your mouse pointer over the statistical line to view the statistics of each item at a specific point in time.

----End

3.8 Adding Tags to a Bucket

When creating a bucket, you can add tags to it. For details, see **Creating a Bucket**. You can also add tags to a bucket after it has been created. This section describes how to add tags to an existing bucket.

Scenarios

Tags help you to identify your cloud resources. When you have many cloud resources of the same type, you can use tags to classify them by dimension (for example, by purpose, owner, or environment) for usage or cost analysis.

In OBS, you can use tags to identify and classify OBS buckets.

If you add tags to a bucket, service detail records (SDRs) generated for it will be labeled with these tags. You can classify SDRs by tag for cost analysis. For example, if you have an application that uploads its running data to a bucket, you can tag the bucket with the application name. In this manner, the costs on the application can be analyzed using tags in SDRs.

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Constraints

- A tag is structured as a key-value pair that is case sensitive.
- A bucket can have a maximum of 20 tags by default. Each tag has only one key and one value.
- Each key must be unique among all tags of a bucket, whereas the tag values can be repetitive or left blank.
- It takes approximately three minutes for an added tag to take effect.

Ways to Add Bucket Tags

You can use **OBS Console**, APIs, or SDKs to add tags to a bucket.

Using OBS Console

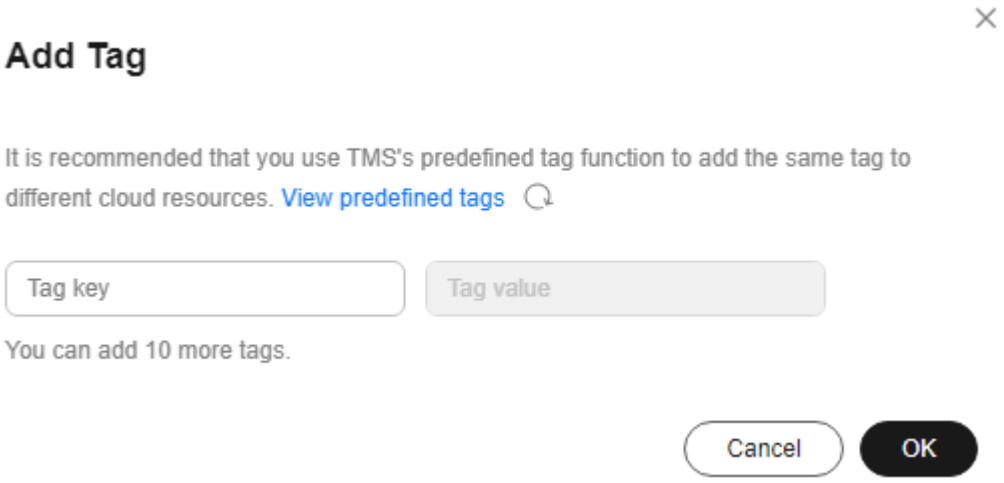
Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Basic Configurations** > **Tags**.

Step 4 Click **Add Tag**. The **Add Tag** dialog box is displayed.

Figure 3-13 Add Tag



Step 5 Set the key and value based on **Table 3-9**.

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Table 3-9 Parameter description

Parameter	Description
Tag key	Key of a tag. Tag keys for the same bucket must be unique. You can customize tags or select the ones predefined on TMS. A tag key: • Must contain 1 to 36 characters and be case sensitive. • Cannot start or end with a space or contain the following characters: ,/|<>=*\
Tag value	Value of a tag. A tag value can be repetitive or left blank. A tag value: • Can contain 0 to 43 characters and must be case sensitive. • Cannot contain the following characters: ,/|<>=*\

Step 6 Click **OK**.

It takes approximately 3 minutes for the tag to take effect.

----End

Using APIs

Configuring Tags for a Bucket

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Related Operations

In the tag list, click **Edit** to change the tag value or click **Delete** to remove the tag.

3.9 Deleting a Bucket

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to delete unwanted or empty buckets to free up the bucket quantity quota.

An empty bucket must meet the following requirements:

- There is no object or any historical version of an object in the bucket.
- There is not any incomplete multipart upload in the bucket. In other words, there are no fragments in the bucket.

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NOTE

Before deleting a bucket with versioning enabled, ensure that all historical versions and deleter markers (which are also taken as historical versions) in it have been deleted.

Constraints

OBS buckets are global resources, so each bucket name must be unique across all users, including your own. To reuse the name of a deleted bucket for another bucket, you must wait until the bucket name is released. Deleting a bucket via API takes about 30 minutes. However, the process may take longer if the bucket is not empty, or if the account is in arrears or has been deregistered. OBS cannot guarantee immediate deletion. Therefore, if you attempt to create a new bucket using a name that has not been released, the creation will fail. Similarly, if the name is released but claimed by another user before you reuse it, the creation will also fail.

Prerequisites

- All objects in the bucket have been permanently deleted. A bucket must be emptied before it can be deleted.

  NOTICE

  Objects under the **Objects**, **Deleted Objects**, and **Fragments** tabs must be all deleted.

- A bucket can only be deleted by the bucket owner.

Ways to Delete a Bucket

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to delete a bucket.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, select the bucket you want to delete, and then click **Delete** on the right.

NOTE

The name of a deleted bucket can be reused for another bucket or parallel file system at least 30 minutes after the deletion.

Step 3 Click **OK** to confirm the deletion.

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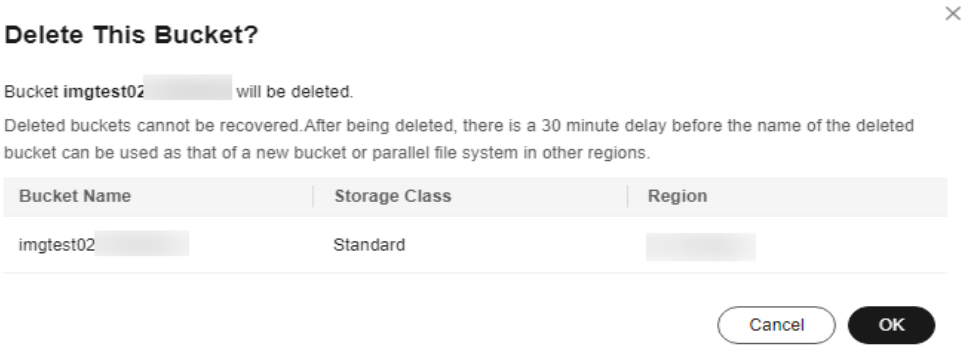
Figure 3-14 Deleting a bucket



----End

Using APIs

Deleting Buckets

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Select the bucket you want to delete and click **Delete**.

NOTE

The name of a deleted bucket can be reused for another bucket or a parallel file system at least 30 minutes after the deletion.

Step 3 Click **Yes** to delete the bucket.

----End

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
  ```
  obsutil rm obs://bucket [-f] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
  ```
- In Linux or macOS
  ```
  ./obsutil rm obs://bucket [-f] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
  ```

Examples

- Take the Windows OS as an example. Run the **obsutil rm obs://bucket-test** command to delete bucket **bucket-test**.
  ```
  obsutil rm obs://bucket-test
  ```

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```
Start at 2024-09-30 07:58:33.736622 +0000 UTC

Do you want to delete bucket [bucket-test] ? Please input (y/n) to confirm:
y
Delete bucket [bucket-test] successfully!
```

Parameter Description

Parameter	Optional or Mandatory	Description
bucket	Mandatory	The bucket name
f	Optional (additional parameter)	Runs in force mode.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

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4 Object Management

4.1 Object Overview

An object is the basic unit of data storage on OBS. It consists of object data and object metadata that describes object attributes. Data uploaded to OBS is stored as objects in **buckets**.

An object consists of data, metadata, and a key.

- A key specifies the name of an object. An object key is a UTF-8 string up to 1,024 characters long. Each object within a bucket is uniquely identified by a key.
- Metadata describes an object, and can be system-defined or user-defined. The metadata is a set of key-value pairs that are assigned to the object stored in OBS.
  - System-defined metadata is automatically assigned by OBS. Such metadata includes Date, Content-Length, Last-Modified, Content-MD5, and more.
  - User-defined metadata is specified when you upload objects and is used to describe objects.
- Data refers to the content of the object.

Generally, objects are managed as files. However, OBS is an object-based storage service and there is no concept of files and folders. For easy data management, OBS provides a method to simulate folders. By adding a slash (/) in an object name, for example, **test/123.jpg**, you can simulate **test** as a folder and **123.jpg** as the name of a file under the **test** folder. However, the object key remains **test/123.jpg**.

When uploading an object, you can specify a **storage class** for it. If you do not specify a storage class, the object inherits the storage class of the bucket. You can also change the storage class of an existing object in a bucket.

You can **upload files (data) to a bucket** in the ways you like based on your habits and service scenarios. OBS then stores the files as objects in the bucket. In OBS, buckets are located in **different regions**. No matter what method you use, you can access the same bucket and its resources in the same region.

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Guidelines on Naming Object Keys

Although any UTF-8 characters can be used in an object key name, naming object keys according to the following guidelines can help maximize the object keys' compatibility with other applications. Ways to analyze special characters vary with applications. The following guidelines help object key names substantially meet the requirements of DNS, web security characters, XML analyzers and other APIs.

The following character sets can be freely used in key names.

Alphanumeric characters (also known as unreserved characters)	[0-9a-zA-Z]
Special characters (also known as reserved characters)	Exclamation mark (!) Hyphen (-) Underscore (_) Period (.) Asterisk (*) Single quotation mark (') Left bracket "(" Right bracket ")"

The following are examples of valid object key names:

```
4my-organization
my.great_photos-2014/jan/myvacation.jpg
videos/2014/birthday/video1.wmv
```

Percent-Encoding of Reserved Characters

If a reserved character has a special meaning (known as reserved purpose) in a URI and the character must be used for other purposes in the URI, this character must be percent-encoded. Use UTF-8 to encode non-ASCII characters. Otherwise, the names of the objects that are uploaded to OBS may be different from what is expected. For example, if reserved character "/" is used as the delimiter of path components in a URI, the character has a special meaning (separating a bucket name from an object name). If "/" is used in a component of the path in a URI, use three characters "%2F" or "%2f" to replace "/". The reserved character " " must be encoded as "%20". For example, the string "abc d" will be encoded as "abc%20d".

Characters That May Require Special Processing

Characters that require encoding in a key name

- Ampersand (&)
- Dollar sign ($)
- Semicolon (;)
- Colon (:)

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- Plus sign (+): OBS decodes plus signs (+) in a request URI into spaces. If an original object key name contains plus signs (+), it must be encoded into %2B before being put into the request URI.
- Space: A large number of consecutive spaces may be lost in some cases.
- Equality sign (=)
- At sign (@)
- Comma (,)
- Question mark (?)
- ASCII characters: 00–1F in hexadecimal form (0–31 in decimal form) and 7F (127 in decimal form)

Avoid using the following characters in key names, because these characters require a lot of special processing to keep consistency across all applications.

- Backslash (\)
- Left brace ({)
- Non-printable ASCII characters (128–255 decimal characters)
- Insert symbol (^)
- Right brace (})
- Percentage character (%)
- Accent/Untick (`)
- Right square bracket (])
- Quotation mark
- Greater than sign (>)
- Left square bracket ([)
- Tilde (~)
- Less than sign (<)
- Number sign (#)
- Vertical bar (|)

Note that OBS adopts a flat structure, where you create buckets and store objects in buckets. There are no sub-buckets or sub-folders in the structure. However, you can use key name prefixes and delimiters to deduce the logical structure like **OBS Console** does. The folder concept is supported on OBS Console. Assume that your bucket (**companybucket**) contains four objects with the following object keys:

- bucket-log/log01.txt
- cgvbs/test1.txt
- 2015-10-14_111756.png
- test1.txt

OBS Console uses a key name prefix (**bucket-log/** or **cgvbs/**) and separator (/) to display the folder structure, as shown in the following figure.

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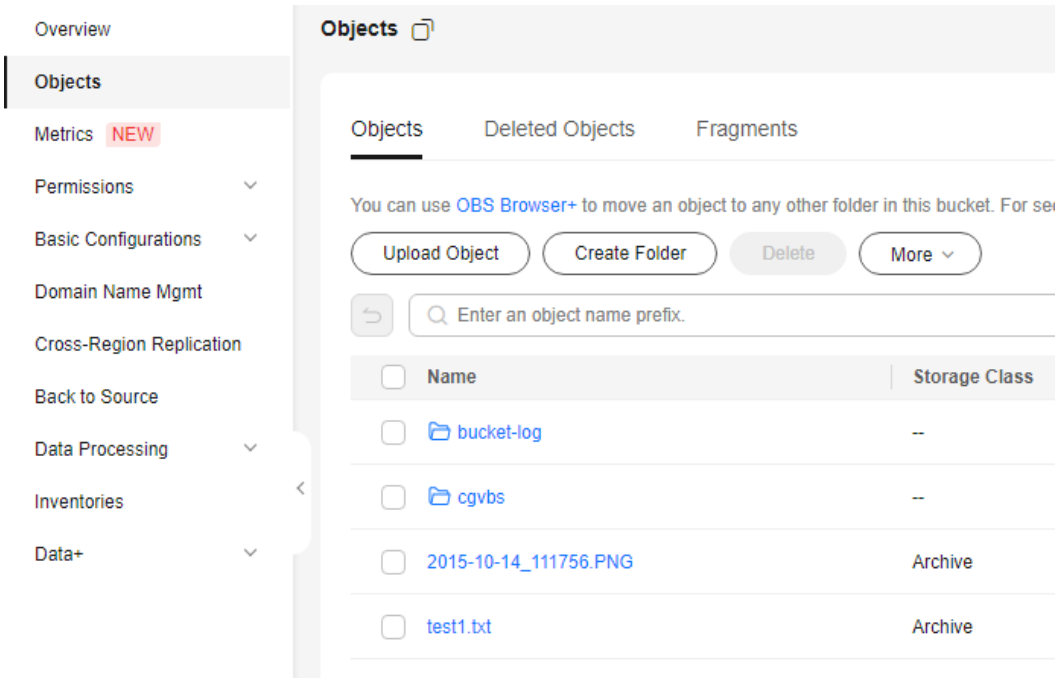
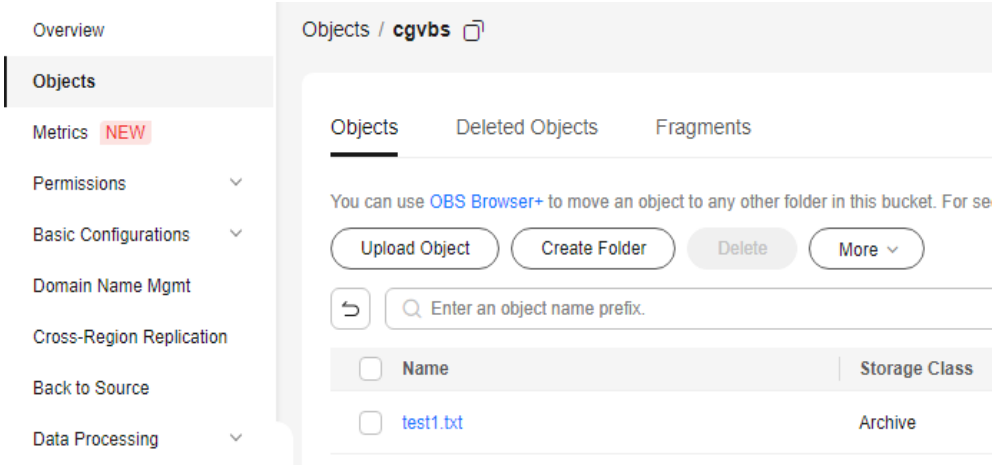


The **2015-10-14_111756.png** and **test1.txt** keys do not have a prefix, so they appear at the root level of the bucket. If you open the **cgvbs/** folder, you will see that it contains the **test1.txt** object.



Assume that your bucket (**companybucket**) contains two objects with the following object keys:

- obj
- 1/../obj or 1/./obj

If you use APIs, SDKs, or OBS Browser+ to obtain these two objects, you will successfully get them. If you use OBS Console to access them, you will actually get object **obj** based on the relative relationship. Since **../** and **./** has special semantics in URIs, avoid using them in object keys. In addition, if an object's name includes **../** or **./**, this object cannot be edited on **OBS Console**, such as changing its storage class or setting lifecycle rules.

Object names cannot start with consecutive periods (..) or a single period (.).

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4.2 Uploading an Object

4.2.1 Upload Overview

Scenarios

You can upload files or folders to an existing OBS bucket. These files can be texts, images, videos, or any other types of files.

If you want to organize the files you upload, create folders first and upload each file to an appropriate folder. For details about how to create a folder, see **Creating a Folder**.

CAUTION

OBS allows you to upload objects to buckets in a specified region, but Huawei Cloud does not detect the object content you uploaded. If your object uploads involve cross-border transfer, ensure that your use complies with relevant laws and regulations.

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Upload Methods

Method	Scenario	Single File Size	Object Type	Tool Supported
Simple upload (PUT)	For uploading **small files**	≤ 5 GB	Normal	**OBS Console**, OBS Browser+, obsutil, SDKs, and APIs **NOTE** To improve the upload success rate, **OBS Console** automatically uses multipart upload for objects larger than 8 MB, and OBS Browser+ and obsutil automatically use resumable upload for objects larger than 50 MB.
Form-based upload (POST)	For uploading **small files** via **HTML web pages**. You can use the form's **PostPolicy** to limit the file size and type.	≤ 5 GB	Normal	APIs and SDKs

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Method	Scenario	Single File Size	Object Type	Tool Supported
Multipart upload	For uploading **large files**. You need to make several API calls: one to **initiate a multipart upload**, others to **upload parts**, and a final call to **complete the multipart upload**. Once the upload is complete, the uploaded parts are assembled into a single, complete object. If parts fail to be uploaded due to unstable network, you need to **manually record the failed parts and upload them again**.	≤ 48.8 TB	Multipart	**OBS Console** (for a total size of no more than 5 GB), OBS Browser+, obsutil, SDKs, and APIs
Resumable transfer	For uploading **large files** over unstable networks. Similar to multipart upload, a file is split into multiple parts and uploaded in parallel. However, with resumable transfer, the client automatically **tracks the upload progress** and **resumes from the point where the upload was interrupted**.	≤ 48.8 TB	Multipart	OBS Browser+, obsutil, and SDKs
Append upload	For **continuously adding data to the end of an object**. For example, in video streaming scenarios, an append upload is typically used. You can append data to the end of an appendable object that was created using the append upload API. The data appended each time can be read instantly.	The size of data appended each time: ≤ 5 GB	Appendable	APIs and SDKs
Third-party upload	For third parties to upload files. Anonymous users with upload permissions use their own AKs/SKs to generate **time-limited pre-signed URLs**. Within the validity period of the URLs, anonymous users can use the URLs to securely upload objects without keys. The URLs become invalid after they expire.	≤ 5 GB	Normal	**Calculate a signature** and construct a URL.

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Batch Upload

Only buckets whose version is **3.0** support batch upload. To check the bucket version, see **Checking OBS Version (OBS 2.0 or OBS 3.0)**. The following table lists the batch upload support across OBS tools.

Tool	Batch Upload Supported	Number of Objects Allowed in a Batch	Max. Total Object Size Allowed in a Batch
OBS Console	Yes, in some regions. For specific availability, see the information displayed on **OBS Console**.	100	≤ 5 GB
OBS Browser+	Yes	500	Unlimited
obsutil	Yes	Unlimited	Unlimited
APIs	No dedicated batch upload API is available. To use batch uploads, you need to write your own code.	N/A	N/A
SDKs		N/A	N/A

Object Types

Object Type	Description	Notes
Normal	Objects that are uploaded using **Simple Upload (PUT)** or **Form-based Upload (POST)**	If versioning is not enabled or is suspended, a newly uploaded object overwrites the previous one with the same name and only the object uploaded by the last API call is retained. If versioning is enabled, each upload of an object with the same name will create a new version of the object. The version created in the last upload is the latest version.

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Object Type	Description	Notes
Multipart	Objects that are uploaded using **Multipart Upload**	If versioning is not enabled or is suspended, the complete object that is assembled later overwrites the previous one with the same name and only the complete object assembled by the last API call is retained. If versioning is enabled, each time you assemble an object with the same name will create a new version of the object. The version created in the last multipart upload is the latest version.
Appendable	Objects that are uploaded using **Appendable Upload**	You can directly append data to the end of such objects.

Object Uploads in a Bucket with Versioning Enabled or Not Enabled

- In a bucket with versioning not enabled:
  - If you upload a new file with the same name as the previous file in the bucket, the new file will overwrite the previous one, and the previous file's ACL information will not be retained.
  - If you upload a new folder with the same name as the previous folder in the bucket, the two folders will be merged, and files in the new folder will overwrite those with the same name in the previous folder.
- In a bucket with versioning enabled:

  If you upload a new file with the same name as the one you previously uploaded to the bucket, a new file version will be added to the bucket. For details, see **Versioning**.

References

- If you have over 48.8 TB data to upload, refer to **Migrating Local Data to OBS**.
- You can specify a quota for a bucket to limit its storage capacity. For details, see **Managing Bucket Quotas**.

4.2.2 Simple Upload (PUT)

Scenarios

If the size of an object, such as a text file, an image, or a video, to be uploaded is smaller than 5 GB, you can use simple upload (PUT).

Parameters sent by PUT are passed in the request header. You need to specify the object name in the URL. An example request is as follows:

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```
PUT /ObjectName HTTP/1.1
```

NOTICE

OBS allows you to upload objects to buckets in a specified region, but Huawei Cloud does not detect the object content you uploaded. If your object uploads involve cross-border transfer, ensure that your use complies with relevant laws and regulations.

Prerequisites

- You have the write permissions to a bucket.
- If you want to classify files, you can create folders and upload files to different folders. For details, see **Creating a Folder**.

Constraints

Size and number of objects

- If a file is smaller than 5 GB, use simple upload. To upload a file larger than 5 GB, refer to **Multipart Upload**.
- You can specify a quota for a bucket to limit its storage capacity. For details, see **Managing Bucket Quotas**.

Object naming

See **Guidelines on Naming Object Keys**.

Batch operations

Batch uploads are available only when:

1. The bucket is in CN-Hong Kong, AP-Bangkok, and AP-Singapore.
2. The bucket version is 3.0. To view a bucket version, see **Checking OBS Version (OBS 2.0 or OBS 3.0)**.

Folder uploads

You can upload folders using **OBS Console**, OBS Browser+, or obsutil.

Other

- Versioning is not enabled for a bucket:
  - If you upload a new file with the same name as the one in the bucket, the new file will automatically overwrite the previous one and the ACL information of the previous file will not be retained.
  - If you upload a new folder with the same name as the one in the bucket, the two folders will be merged, and files in the new folder will overwrite those with the same name in the previous folder.
- Versioning is enabled for a bucket: If you upload a new file with the same name as the one you previously uploaded to the bucket, a new file version will be added to the bucket. For details, see **Versioning**.

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Ways to Upload

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to upload objects.

To improve the upload success rate, OBS Console automatically uses multipart upload for objects larger than 8 MB, and OBS Browser+ and obsutil automatically use resumable upload (essentially multipart upload) for objects larger than 50 MB. You will not perceive any backend switchovers, as your operations on **OBS Console** or tools keep unchanged.

Using OBS Console

Step 1 In the navigation pane of OBS **Console**, choose **Object Storage**.

Step 2 In the bucket list of **OBS Console**, click the desired bucket to go to the **Objects** page.

Step 3 On the object list page, click **Upload Object**.

You can also go to the folder that the file is to be uploaded to and click **Upload Object**.

Batch upload is used as an example here. If a region only supports single upload, follow the on-screen instructions.

NOTE

If the files that you want to upload to OBS are stored in Microsoft OneDrive, it is recommended that the names of these files contain a maximum of 32 characters to ensure compatibility.

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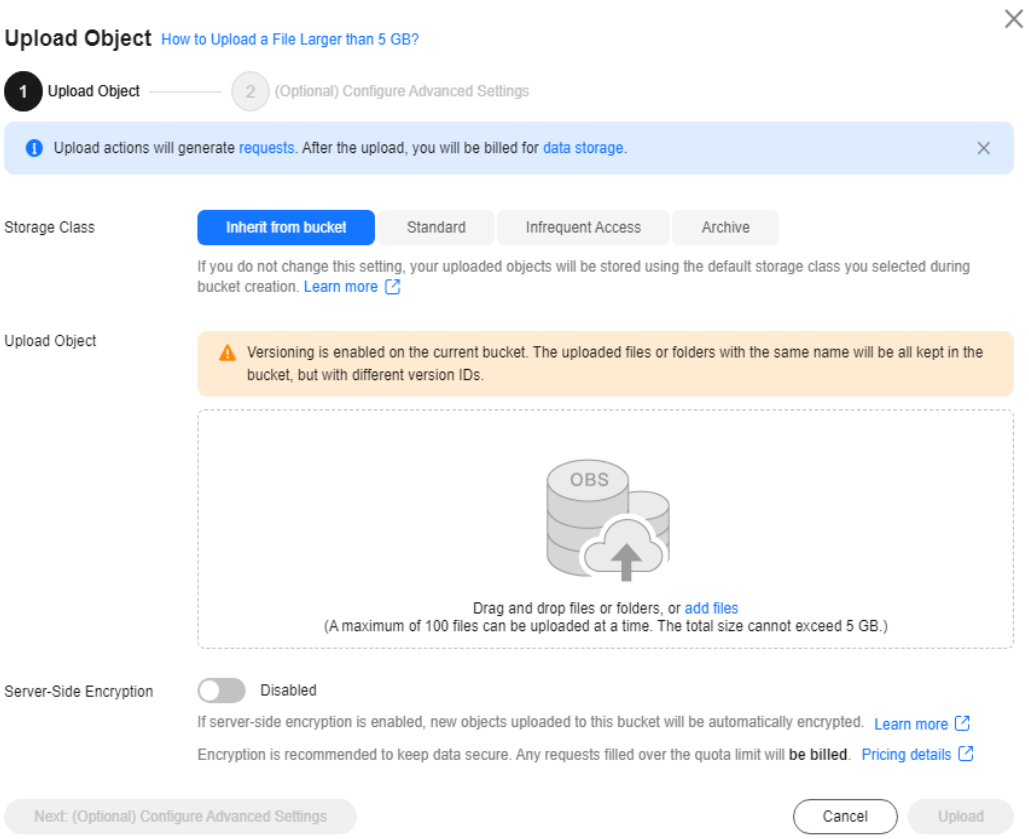
Figure 4-1 Uploading objects



Step 4 Select a storage class. If you do not specify a storage class, the objects you upload inherit the default storage class of the bucket.

NOTE

An object can have a different storage class from its bucket. By default, an object inherits the storage class of the bucket where it is uploaded. You can specify a storage class for an object when uploading it, or you can change the object storage class after the object is uploaded.

Step 5 Drag and drop the files or folders you want to upload to the **Upload Object** area.

You can also click **add files** in the **Upload Object** area to select files.

Step 6 **Server-Side Encryption**: Disable it or choose **SSE-KMS** or **SSE-OBS**. For details, see **Server-Side Encryption Overview**.

NOTE

If your bucket has **server-side encryption** enabled, you can select **Inherit from bucket** when uploading an object.

Step 7 (Optional) To configure metadata, or retention policies, or object tags, click **Next: (Optional) Configure Advanced Settings**.

NOTE

WORM retention policies can be configured in the advanced settings only when WORM is enabled for the bucket.

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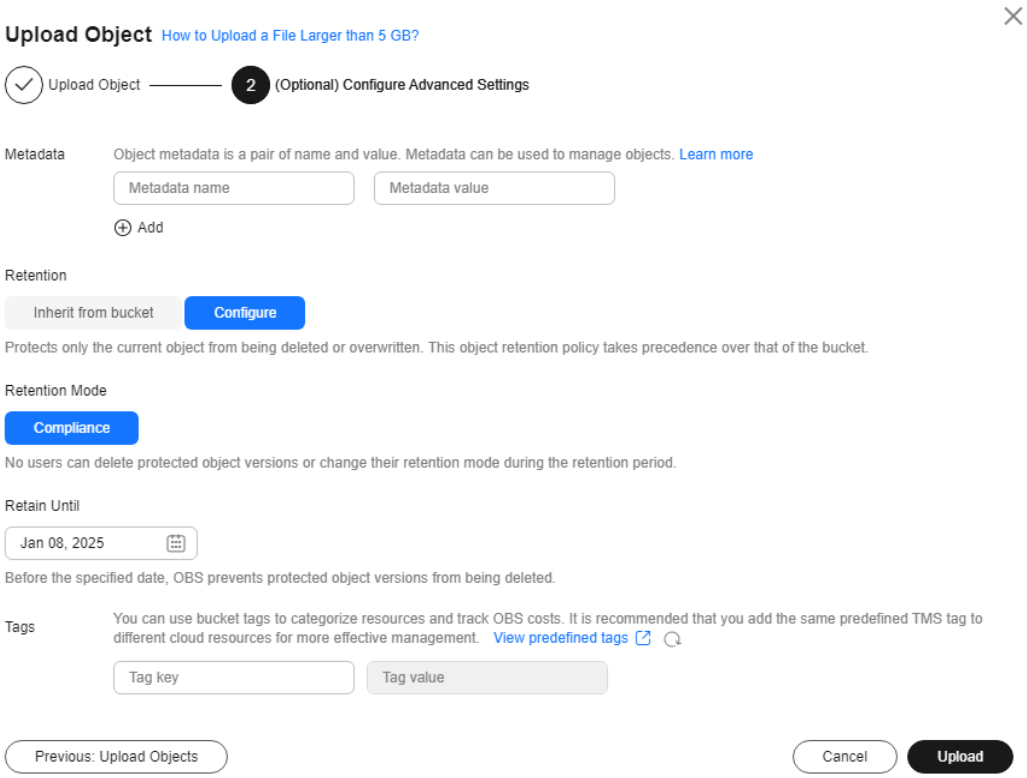
Configuring metadata: Add metadata ContentDisposition, ContentLanguage, WebsiteRedirectLocation, ContentEncoding, or ContentType as needed. For more information, see **OBS Metadata**. Metadata is a set of name-value pairs. The metadata value cannot be left blank. You can add multiple metadata entries by clicking **Add**.

Configuring retention: Choose **Inherit from bucket**, or choose **Configure** and then specify a retention period, to automatically protect new objects uploaded to the bucket from being deleted before the specified date.

Configuring tags: Tags are used to identify objects with tag keys and values. For details, see **Adding Tags to an Object**.

Figure 4-2 Configuring metadata or WORM retention



Step 8 Click **Upload**.

----End

Using APIs

Uploading an Object

Using SDKs

Java	Python	C	Go	BrowserJS: not supported	.NET	Android	iOS	PHP	Node.js

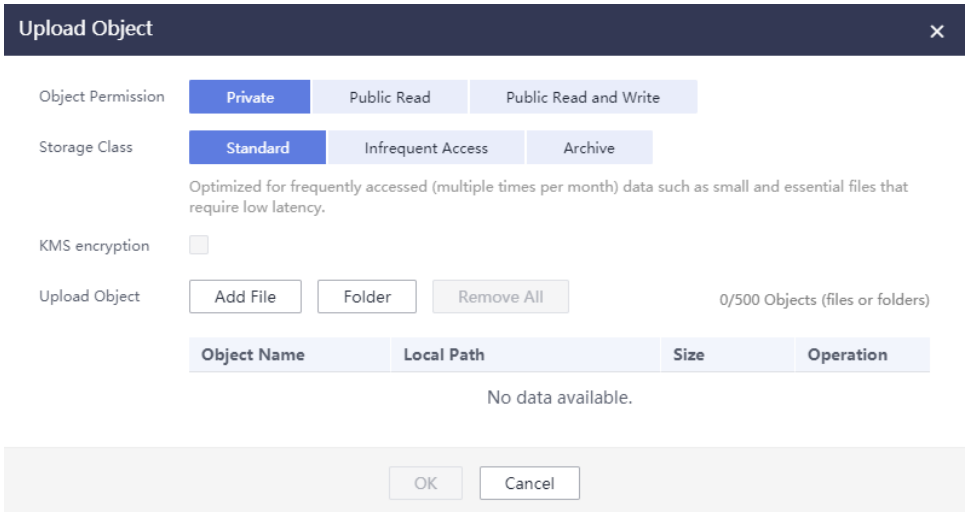
Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Click the bucket where you want to upload files or folders.

Step 3 Click **Upload** and then **Add File** or **Folder**, as shown in **Figure 4-3**.

Figure 4-3 Uploading a file or folder



For better experience when using the **Add File** function, you are advised to upload a maximum of 100 files at a time. If you need to upload more, place all the files in a folder and upload them by adding a folder.

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NOTE

1. If message "Service Unavailable" is displayed when files are being uploaded, try again later.
2. If an access deny message is displayed when you are uploading a file or folder, possible causes are as follows:

- Access to the bucket is restricted by an ACL. For example, you do not have the write permission for the bucket.
- Access to the bucket is restricted by a bucket policy. For example, you do not have the write permission for the bucket, or write operations cannot be performed on the bucket during the current period.

  If such message is displayed, check ACL and policy settings of the bucket and resolve the problem accordingly.

CAUTION

You must have access to the file you want to upload, or the file upload will fail.

Step 4 In the displayed dialog box, select the file or folder you want to upload and click **Open**.

You can upload one folder or multiple files at a time. To upload multiple files, hold down **Ctrl** or **Shift** to select multiple files and batch upload them. You can also press **Ctrl+A** to select all files. The operations are consistent with those in Windows operating systems.

Step 5 Click **OK**.

----End

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
  - Uploading a file

    ```
    obsutil cp file_url obs://bucket[/key] [-arcDir=xxx] [-dryRun] [-link] [-u] [-vlength] [-vmd5] [-p=1] [-threshold=5248800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-o=xxx] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

  - Uploading a folder

    ```
    obsutil cp folder_url obs://bucket[/key] -r [-arcDir=xxx] [-dryRun] [-link] [-f] [-flat] [-u] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

  - Uploading multiple files/folders

    ```
    obsutil cp file1_url,folder1_url|filelist_url obs://bucket[/prefix] -msm=1 [-r] [-arcDir=xxx] [-dryRun] [-link] [-f] [-u] [-vlength] [-vmd5] [-flat] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx][-timeRange=time1-time2] [-at] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

    NOTE

    In this command, **/prefix** is the name prefix for uploading folders. For more examples, see **Upload**.

- In Linux or macOS

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- Uploading a file

```
./obsutil cp file_url obs://bucket[/key] [-arcDir=xxx] [-dryRun] [-link] [-u] [-vlength] [-vmd5] [-p=1] [-threshold=5248800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-o=xxx] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

- Uploading a folder

```
./obsutil cp folder_url obs://bucket[/key] -r [-arcDir=xxx] [-dryRun] [-link] [-f] [-flat] [-u] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-at] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

- Uploading multiple files/folders

```
./obsutil cp file1_url,folder1_url|filelist_url obs://bucket[/prefix] -msm=1 [-r] [-arcDir=xxx] [-dryRun] [-link] [-f] [-u] [-vlength] [-vmd5] [-flat] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx][-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

> NOTE
>
> In this command, **/prefix** is the name prefix for uploading folders. For more examples, see **Upload**.

Examples

- Take the Windows OS as an example. Run the **obsutil cp d:\temp\test.txt obs://bucket-test/key** command to upload the **test.txt** file in the **temp** directory in the **D:** drive to bucket **bucket-test** and rename the file as **key**.

```
obsutil cp d:\temp\test.txt obs://bucket-test/key
Start at 2024-09-30 08:11:41.6724827 +0000 UTC

Parallel:      5                 Jobs:          5
Threshold:     50.00MB           PartSize:      auto
VerifyLength:  false             VerifyMd5:     false
CheckpointDir: C:\Users\Administrator\.obsutil_checkpoint

[=================================================] 100.00% 1.68 MB/s 8.46MB/8.46MB 5s
Upload successfully, 8.46MB, n/a, d:\temp\test.txt --> obs://bucket-test/key, cost [5], status [200], request id [0000016979E1D2B2860BB5181229C72C]
```

- Take the Windows OS as an example. Run the **obsutil cp d:\temp obs://bucket-test -f -r** command to recursively upload all files and subfolders in the **temp** directory in the **D:** drive to the **temp** folder in bucket **bucket-test**.

```
obsutil cp d:\temp obs://bucket-test -f -r
Start at 2024-09-30 08:14:12.1406275 +0000 UTC

Parallel:      5                 Jobs:          5
Threshold:     50.00MB           PartSize:      auto
VerifyLength:  false             VerifyMd5:     false
CheckpointDir: C:\Users\Administrator\.obsutil_checkpoint

Task id: 104786c8-27c2-48fc-bc6a-5886596fb0ed
OutputDir: C:\Users\Administrator\.obsutil_output

[=================================================] 100.00% tps:35.71 2.02 KB/s 7.20MB/7.20MB 0s
Succeed count:   5        Failed count:    0
Succeed bytes:      xxx
Metrics [max cost:90 ms, min cost:45 ms, average cost:63.80 ms, average tps:35.71, transferred size: 7.20MB]

Task id: 104786c8-27c2-48fc-bc6a-5886596fb0ed
```

- For more examples, see **Common Examples**.

Parameter Description

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Parameter	Optional or Mandatory	Description
file_url	Optional for uploading multiple files/ folders Mandatory for uploading a file	The local file path • Do not nest paths when uploading multiple files/folders. For example, you cannot specify **/a/b/c** and **/a/b/** at the same time. • If this parameter is configured when uploading multiple files/folders, **msm** must be set to **1**. In this case, use commas (,) to separate multiple file paths, for example, **file_url1,file_url2**. • Files and folders can both be included when uploading multiple files/folders. For example, **file_url1,folder_url1,file_url2,folder_url2**.
folder_url	Optional for uploading multiple files/ folders Mandatory for uploading a folder	The local folder path • If **flat** is not configured when uploading a folder, the entire folder is uploaded. If **flat** is configured, all files in the folder are uploaded. • Do not nest paths when uploading multiple files/folders. For example, you cannot specify **/a/b/c** and **/a/b/** at the same time. • If this parameter is configured when uploading multiple files/folders, **msm** must be set to **1**. In this case, use commas (,) to separate multiple folder paths, for example, **folder_url1,folder_url2**. • Files and folders can both be included when uploading multiple files/folders. For example, **file_url1,folder_url1,file_url2,folder_url2**.

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Parameter	Optional or Mandatory	Description
filelist_url	Optional for uploading multiple files/ folders	The path of the file that contains the list of files/folders to be uploaded. If this parameter is configured, **msm** must be set to **2**. • The list file is in common text file formats, such as TXT and CSV. Each line in the file indicates a file or folder to be uploaded. For example: file_url1 file_url2 folder_url1 folder_url2 • Do not nest paths in the list file. For example, you cannot specify **/a/b/c** and **/a/b/** at the same time.
bucket	Mandatory	The name of the bucket where you will upload the file or folder

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Parameter	Optional or Mandatory	Description
key	Optional	The object name or object name prefix specified when uploading a file, or the object name prefix specified when uploading a folder When uploading a file or folder, the upload path and name change depending on the value of this parameter. The specific rules are as follows: • If this parameter is left blank, the object is uploaded to the root directory of the bucket, and the object name is the name of the uploaded file or folder. • If this parameter is specified: – If the parameter value ends with a slash (/), the object is uploaded to the directory indicated by this value, and the object name is the parameter value plus the file name, for example, **folder/filename.txt** or **folder/foldername**. – If the parameter value does not end with a slash (/), the object name for the file is the parameter value, for example, **filename.txt**, and the object name for the folder is the parameter value plus a slash (/), for example, **folder/**, which is also the name of the directory where the folder is uploaded. **NOTE** For details about how to use this parameter, see **Upload**.
fr	Optional for uploading a file (additional parameter)	Generates an operation result file when uploading a file.
flat	Optional for uploading a folder or multiple files/folders (additional parameter)	Uploads all files in a folder but not the folder itself.
arcDir	Optional (additional parameter)	The path to which the uploaded files are archived
dryRun	Optional (additional parameter)	Conducts a dry run.

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Parameter	Optional or Mandatory	Description
link	Optional (additional parameter)	The actual path of a symbolic link for a file or folder • If this parameter is not specified and the file to be uploaded is a symbolic-link file whose target file does not exist, the exception message "The system cannot find the file specified" will be displayed in Windows OS, while the exception message "No such file or directory" will be displayed in macOS or Linux OS. • Avoid the symbolic link loop of a folder, otherwise, the upload will exit due to panic. If you do not want the system to panic, set **panicForSymbolicLinkCircle** to **false** in the configuration file.
u	Optional (additional parameter)	Indicates incremental upload. If this parameter is set, each file can be uploaded only when it does not exist in the bucket, its size is different from the namesake one in the bucket, or it has the latest modification time. **When you compare each local file with data in the bucket, a billable HEAD request is generated. For details, see Requests.**
vlength	Optional (additional parameter)	After the upload completes, checks whether the sizes of the objects in the bucket are the same as those of the local files.
vmd5	Optional (additional parameter)	After the upload completes, checks whether the MD5 values of the objects in the bucket are the same as those of the local files. • **If your object needs encryption, do not use this parameter.** • If the size of the file or folder to be uploaded is too large, using this parameter will degrade the overall performance due to MD5 calculation. • After the MD5 verification is successful, this parameter value is used for metadata **x-obs-meta-md5chksum**, for later MD5 verification during download or copy.
p	Optional (additional parameter)	The maximum number of concurrent uploads for a multipart upload The default value is the value of **defaultParallels** in the configuration file.

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Parameter	Optional or Mandatory	Description
threshold	Optional (additional parameter)	The threshold for enabling multipart upload. If the size of the file or folder to be uploaded is smaller than the threshold, upload it directly. Otherwise, a multipart upload is required. The default value is the value of **defaultBigfileThreshold** in the configuration file. Unit: byte This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes). **NOTE** If you upload a file or folder directly, no part record is generated, and resumable transmission is not supported.
acl	Optional (additional parameter)	The access control policies that can be specified for objects when uploading files. Possible values are: • **private**: Only users granted permissions by the object ACL can access the object. • **public-read**: Anyone can read objects in the bucket. • **public-read-write**: Anyone can read, write, or delete objects in the bucket. • **bucket-owner-full-control**: Only the bucket owner has full control over objects in the bucket.

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Parameter	Optional or Mandatory	Description
sc	Optional (additional parameter)	The storage classes of objects that can be specified when uploading files Possible values are: • **standard**: Standard storage class. It features low access latency and high throughput, and is applicable to storing frequently accessed data (multiple accesses per month) or data that is smaller than 1 MB. • **warm**: Infrequent Access storage class. It is ideal for storing infrequently accessed (less than 12 times a year) data, but when needed, the access has to be fast. • **cold**: Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once a year) data. • **deep-archive**: Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely (once every few years) accessed. This storage class costs less than the Archive storage class, but takes longer time (usually several hours) to restore data.
meta	Optional (additional parameter)	The standard or user-defined metadata that can be specified during file upload • Standard metadata includes **Content-Type**, **Content-Encoding**, **Cache-Control**, **Content-Disposition**, **Content-Language** and **Expires**. • User-defined metadata must be in the format of *key:value*. Multiple user-defined metadata items are separated by number signs (#), for example, *key1:value1*#*key2:value2*#*key3:value3*, which indicates that the file uploaded to the bucket contains three groups of user-defined metadata: *key1:value1*, *key2:value2*, and *key3:value3*.

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Parameter	Optional or Mandatory	Description
ps	Optional (additional parameter)	The size of each part in a multipart upload task • The default value is the value of **defaultPartSize** in the configuration file. The parameter can be set to **auto**. In this case, obsutil automatically configures the part size for each multipart task based on the source file size. • Range: **100KB** to **5GB** • Unit: byte. This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes).
cpd	Optional (additional parameter)	The folder where the part records reside. The default value is **.obsutil_checkpoint**, the subfolder in the home directory of the user who executes obsutil commands. A part record is generated during a multipart upload and saved to the **upload** subfolder. After the upload succeeds, its part record is deleted automatically. If the upload fails or is suspended, the system attempts to resume the task according to its part record when you perform the upload the next time.
r	Mandatory for uploading a folder (additional parameter) Optional for uploading multiple files/ folders	Recursively uploads all files and subfolders within a folder.
f	Optional for uploading a folder or multiple files/ folders (additional parameter)	Runs in force mode.
j	Optional for uploading a folder or multiple files/ folders (additional parameter)	The maximum number of concurrent tasks for uploading a folder. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.

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Parameter	Optional or Mandatory	Description
msm	Mandatory for uploading multiple files/ folders (additional parameter)	Enables the mode for uploading multiple files/folders. Possible values are **1** and **2**. ● If **msm** is set to **1**, the source URL indicates a list of file/folder names separated by commas. ● If **msm** is set to **2**, the source URL indicates a file containing a list of file/folder names. ● If the file or folder name already contains commas (,), do not set **msm** to **1**. ● If parameter **r** is not set, the folders in the list will not be uploaded.
exclude	Optional for uploading a folder or multiple files/ folders (additional parameter)	The file matching patterns that are excluded. After this parameter is specified, if the name of the file to be uploaded matches the value of this parameter, the file is skipped. For example, if this parameter is set to ***.txt**, all files whose names end with **.txt** are skipped and not uploaded. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent ***** and **\?** to represent **?**. ● Multiple **exclude** parameters can be specified, for example, **-exclude=*.xxx -exclude=*.xxx**. **Restrictions**: The matching pattern takes effect only for files in the folder. **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute file path (including the file name and file directory).

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Parameter	Optional or Mandatory	Description
include	Optional for uploading a folder or multiple files/ folders (additional parameter)	The file matching patterns that are included. After this parameter is specified, if the name of the file to be uploaded matches the value of this parameter, the file is uploaded. For example, if this parameter is set to ***.txt**, all files whose names end with **.txt** are uploaded. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent * and **\?** to represent **?**. ● Multiple **include** parameters can be specified, for example, **-include=*.xxx -include=*.xxx**. **Restrictions**: ● The matching pattern takes effect only for files in the folder. ● If both the **exclude** and **include** parameters are configured, the **exclude** rules are applied first. If the name of a file to be uploaded does not match **exclude**, OBS checks whether the file name matches **include**. If yes, the file is uploaded. If no, the file is skipped. **Example:** `./obsutil cp /localpath/ obs://test/ -include=/localpath/2022-12-09/* -f -r` This command uploads files that are under **localpath** and start with **/localpath/2022-12-09/** to bucket **test**. **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute file path (including the file name and file directory).

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Parameter	Optional or Mandatory	Description
at	Optional for uploading a folder or multiple files/ folders (additional parameter)	Indicates that only the files whose latest access time is within the value of **timeRange** are uploaded. This parameter must be used together with **timeRange**.
disableDirObject	Optional for uploading multiple folders (additional parameter)	Indicates the folders themselves are not uploaded as an object. Configuring this parameter can avoid uploading empty folders to a bucket. If a folder contains files, the files will be uploaded and the original path format is retained.
timeRange	Optional for uploading a folder or multiple files/ folders (additional parameter)	The time range matching pattern when uploading files. Only files whose latest modification time is within the configured time range are uploaded. This pattern has a lower priority than the file matching patterns (**exclude**/**include**). That is, the time range matching pattern is executed after the configured file matching patterns. ● Time in the matching pattern is the UTC time. ● The matching time range is represented in *time1*-*time2*, where *time1* must be earlier than or the same as *time2*. The time format is *yyyyMMddHHmmss*. ● Automatic formatting is supported. For example, *yyyyMMdd* is equivalent to *yyyyMMdd***000000**, and *yyyyMM* is equivalent to *yyyyMM***01000000**. ● If this parameter is set to ***-***time2*, all files whose last modification time is earlier than *time2* are matched. If it is set to *time1*-*, all files whose last modification time is later than *time1* are matched.
mf	Optional (additional parameter)	Indicates that the name matching pattern (**include** or **exclude**) and the time matching pattern (**timeRange**) also take effect on folders.

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Parameter	Optional or Mandatory	Description
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (possibly success, failure, and warning files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. • A result file should be named as follows: **cp_{succeed | failed | warning}_report**_*time*_*TaskId*.**txt**. • By default, the maximum size of a single result file is 30 MB. You can set the maximum size by configuring **recordMaxLogSize** in the configuration file. • By default, the maximum number of result files that can be retained is 1,024. You can set the maximum number by configuring **recordBackups** in the configuration file. • If there are multiple folders and files and you need to confirm the details of a failed task, refer to the failure result file **cp_failed_report**_*time*_*TaskId*.**txt** in the result folder and the **log files** in the log path.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Response

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Field	Description
Parallel	The parameter **-p** in the request
Jobs	The parameter **-j** in the request
Threshold	The parameter **-threshold** in the request
PartSize	The parameter **-ps** in the request
Exclude	The parameter **-exclude** in the request
Include	The parameter **-include** in the request
TimeRange	The parameter **-timeRange** in the request
VerifyLength	The parameter **-vlength** in the request
VerifyMd5	The parameter **-vmd5** in the request
CheckpointDir	The parameter **-cpd** in the request
OutputDir	The parameter **-o** in the request
ArcDir	The parameter **-arcDir** in the request
Succeed count	The number of successful tasks
Failed count	The number of failed tasks
Skip count	The number of tasks that are skipped during incremental upload, download, or copy, and synchronous upload, download, or copy. **NOTE** Skipped tasks are recorded into successful tasks.
Warning count	The number of tasks that are executed successfully but contain warnings. **NOTE** • The task for which a warning is generated may be a failure or a success, which needs to be further determined according to the corresponding result list. • The number of tasks that generate warnings is independent of the number of successful or failed tasks. The total number of tasks is the number of successful tasks plus the number of failed tasks.
Succeed bytes	The number of bytes that are successfully uploaded or downloaded.
max cost	The maximum duration of all tasks, in ms
min cost	The minimum duration of all tasks, in ms
average cost	The average duration of all tasks, in ms
average tps	The average number of tasks completed per second
Task id	The unique ID of an operation, which is used to search for the result file generated for a batch task

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4.2.3 Form-based Upload (POST)

Scenarios

If the size of an object, such as a text file, image, or video, to be uploaded is smaller than 5 GB, you can use form-based upload (POST).

POST passes data as form fields in the request body. You need to specify bucket domain name in the URL. An example request is as follows:

```
POST / HTTP/1.1
```

NOTICE

OBS allows you to upload objects to buckets in a specified region, but Huawei Cloud does not detect the object content you uploaded. If your object uploads involve cross-border transfer, ensure that your use complies with relevant laws and regulations.

Prerequisites

- You have the write permissions to a bucket.
- If you want to classify files, you can create folders and upload files to different folders. For details, see **Creating a Folder**.

Constraints

Size and number of objects

- If a file is smaller than 5 GB, use simple upload. To upload a file larger than 5 GB, refer to **Multipart Upload**.
- You can specify a quota for a bucket to limit its storage capacity. For details, see **Managing Bucket Quotas**.

Object naming

See **Guidelines on Naming Object Keys**.

Batch operations

Batch uploads are available only when:

1. The bucket is in CN-Hong Kong, AP-Bangkok, and AP-Singapore.
2. The bucket version is 3.0. To view a bucket version, see **Checking OBS Version (OBS 2.0 or OBS 3.0)**.

Folder uploads

You can upload folders using **OBS Console**, OBS Browser+, or obsutil.

Other

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- Versioning is not enabled for a bucket:
  - If you upload a new file with the same name as the one in the bucket, the new file will automatically overwrite the previous one and the ACL information of the previous file will not be retained.
  - If you upload a new folder with the same name as the one in the bucket, the two folders will be merged, and files in the new folder will overwrite those with the same name in the previous folder.
- Versioning is enabled for a bucket: If you upload a new file with the same name as the one you previously uploaded to the bucket, a new file version will be added to the bucket. For details, see **Versioning**.

Ways to Upload

You can use APIs or SDKs to upload objects via a form.

Using APIs

Uploading an Object

Using SDKs

Java	**Python**	C: not supported	Go: not supported	**BrowserJS**	.NET: not supported	**Android**	iOS: not supported	**PHP**	**Node.js**

4.2.4 Multipart Upload

Scenarios

In a multipart upload, an object is split into multiple parts and these parts are uploaded independently. After all parts are uploaded, OBS assembles them into a single object. Generally, if the size of an object reaches 100 MB, you should use multipart upload instead of simple upload. Multipart upload has the following advantages:

- **Improved throughput**: Uploading parts in parallel speeds up the upload and maximizes bandwidth utilization.
- **Enhanced robustness against network instability**: If a part fails to upload due to network issues, you only need to re-upload that specific part. There is no need to upload the entire object again, which saves both time and traffic.
- **Uploading objects with unknown sizes**: You can use multipart upload to upload an object with an unknown size. For example, in video surveillance scenarios, video files are created and uploaded in real time, so multipart upload is a good choice for uploading these files.

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Constraints

- Folders do not support multipart upload.
- Each request can upload only one part, but multiple requests can be initiated at the same time.
- Constraints on parts:

  Table 4-1 Constraints on parts

Item	Constraints
Maximum object size	48.8 TB
Maximum number of parts for each upload task	10,000
Part number	1 to 10,000 (inclusive)
Part size	5 MB to 5 GB. The size of the last part is between 0 bytes to 5 GB.
Maximum number of parts returned in response to the request for listing uploaded parts	1,000
Maximum number of multipart uploads returned in response to the request for listing initiated multipart uploads	1,000

- If you use **SSE-C** in a multipart upload, you must include the key in the requests for **initiating the multipart upload**, **uploading parts**, and **copying parts**. All requests in this multipart upload must use the same key. **The key is not required for completing the multipart upload.** The complete object is encrypted using SSE-C.
- If you use **SSE-KMS** or **SSE-OBS** in a multipart upload, you only need to configure the encryption method, algorithm, and key in **initiating the multipart upload**.

Billing

- If you want to upload a large number of Deep Archive objects, you can upload them in the Standard storage class and then transition them to the Deep Archive storage class through **lifecycle rules** to lower the costs on PUT requests.
- After initiating a multipart upload and uploading one or more parts, you must complete or abort the multipart upload. This ensures that OBS frees up the space for storing the uploaded parts and stops billing you for the parts.

Permissions

Before performing a multipart upload, you must obtain the permissions listed in the following table.

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Operation	Required Permission
Initiate a multipart upload.	You must be the bucket owner **or** have the **PutObject** permission.
Upload parts.	You must have the **PutObject** permission.
Complete the multipart upload.	You must have the **PutObject** permission.
Copy parts.	You must have the **PutObject** and **GetObject** permissions.
List uploaded parts.	You must be the bucket owner **or** have the **ListMultipartUploadParts** permission.
List multipart uploads.	You must be the bucket owner **or** have the **ListBucketMultipartUploads** permission.
Abort the multipart upload.	You must be the bucket owner **or** have the **AbortMultipartUpload** permission.

Important Notes

- If the local file changes during the upload, all parts need to be uploaded again.
- When concurrent upload operations are performed for the same part of an object, the server follows the Last Write Wins policy, where the Last Write is determined by the time the part's metadata was created. To ensure data accuracy, the client must use a locking mechanism to prevent concurrent uploads of the same part of an object. Locking is not required for concurrent uploads of different parts of an object.
- When uploading a large number of objects, do not name objects with sequential prefixes, such as timestamps or alphabetical order. Objects with sequential prefixes may cause a large number of object indexes to be stored in a specific storage partition. In such case, if there are too many requests for the objects, the requests cannot be handled efficiently.
- It is advised to enable versioning to prevent objects with the same name from being overwritten. Versioning keeps multiple versions of an object in the same bucket. You can restore any historical version at any time.

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Multipart Upload Process

Figure 4-4 Process of a multipart upload

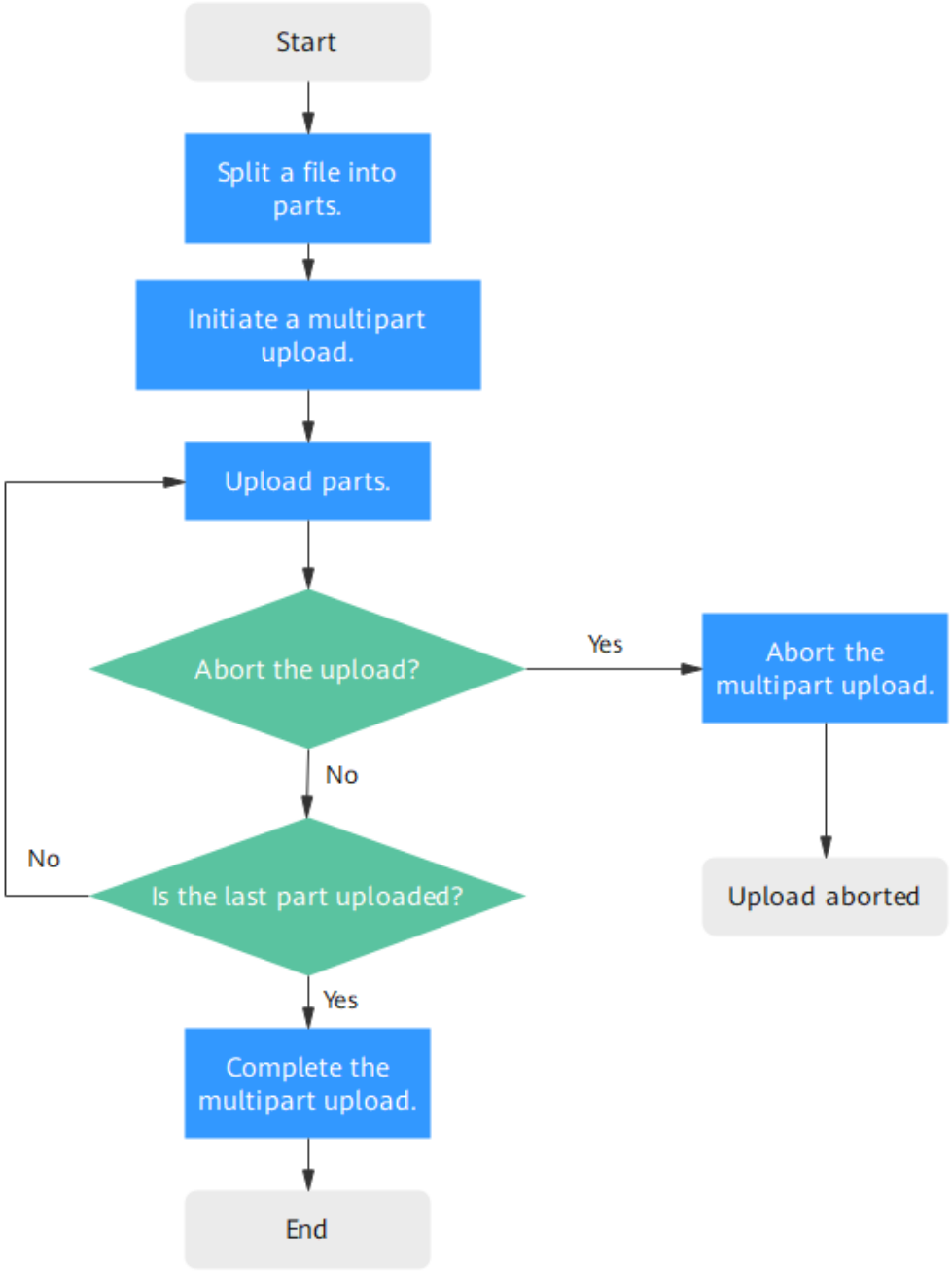

Table 4-2 Process of a multipart upload

No.	Operation	Description
1	Split a file into parts.	On your local client, split a large file into multiple parts. Each part must be between 5 MB and 5 GB in size, except for the last part, which can be 0 bytes to 5 GB.

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No.	Operation	Description
2	**Initiate a multipart upload.**	Initiate a multipart upload and obtain the upload ID. **The ID is required for all subsequent operations in this multipart upload, such as uploading, assembling, and listing parts.** When initiating a multipart upload, you need to specify the storage class, object ACL, and other object properties. Once specified, you do not need to specify them again when uploading or assembling parts later.
3	**Upload parts.**	Upload parts. You can upload parts independently and in any order. If your network is in good condition, you can upload parts concurrently to improve the upload speed and make full use of bandwidth. If a part fails to upload, you only need to upload that part again. The upload of other parts remains unaffected. To abort the upload, **make an API call to abort the multipart upload** and delete the uploaded parts.
4	**Complete the multipart upload.**	After all parts are uploaded, assemble the parts into a single, complete object.

Example of a Multipart Upload

OBS Console, OBS Browser+, and obsutil encapsulate the multipart upload procedure. You only need to know how to upload a file using a GUI or CLI. For details, see **Ways to Upload**. The following uses API Explorer to make OBS API calls to demonstrate how to perform a multipart upload.

Step 1: Split a File into Parts

Split a file into parts on your local client.

Step 1 (Optional) Create a file. Here, we create a 20 MB file named **test.file**. If you have prepared a file, skip this step.

Linux or macOS:

```
dd if=/dev/urandom of=test.file bs=1M count=20
```

On Windows, open CMD and run the following command:

```
fsutil file createnew test.file 20971520
```

Step 2 Split the file into parts. In this example, split the 20 MB **test.file** into five 4 MB parts. Each part is named **test-part******, where **** is a number suffix from 00 to 04.

Linux or macOS:

```
split -b 4M -d test.file test-part
```

On Windows, run the following commands in PowerShell:

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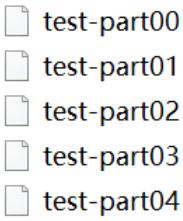
```
$inputFile = "test.file"
$outputFilePrefix = "test-part"
$chunkSize = 4MB

$fs = [System.IO.File]::OpenRead($inputFile)
$buffer = New-Object byte[] $chunkSize
$fileNumber = 0

while ($fs.Position -lt $fs.Length) {
$bytesRead = $fs.Read($buffer, 0, $chunkSize)
$outputFile = "{0}{1:D2}" -f $outputFilePrefix, $fileNumber
$fileStream = [System.IO.File]::Create($outputFile)
$fileStream.Write($buffer, 0, $bytesRead)
$fileStream.Close()
$fileNumber++
}

$fs.Close()
```

Step 3 After the split is complete, verify that all parts are present in the directory where the commands were executed. Parts created in this example are as follows.



----End

Step 2: Initiate a Multipart Upload

Make an API call to initiate a multipart upload and obtain the multipart upload ID.

Step 1 Go to the **InitiateMultipartUpload** page of API Explorer.

Step 2 Set the API call parameters.

Parameter	Example Value	Description
object_key	test.file	The name of the object uploaded to the bucket. It refers to the entire object, not to any individual part.
bucket_name	example-bucket-a-intl	The bucket name. Click ⌄ to choose a bucket that stores your object.
uploads	Leave it blank.	This parameter indicates that the API call initiates a multipart upload, rather than a standard POST upload. Click **Leave Blank** to leave the parameter blank.

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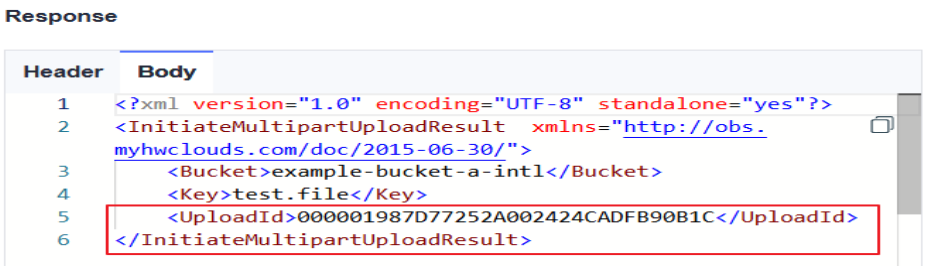
Step 3 Click **Debug**.

Step 4 After the API call succeeds, obtain the **upload ID** from the response in the lower right corner of the page.

As shown in the following figure, the upload ID is **000001987D77252A002424CADFB90B1C**.



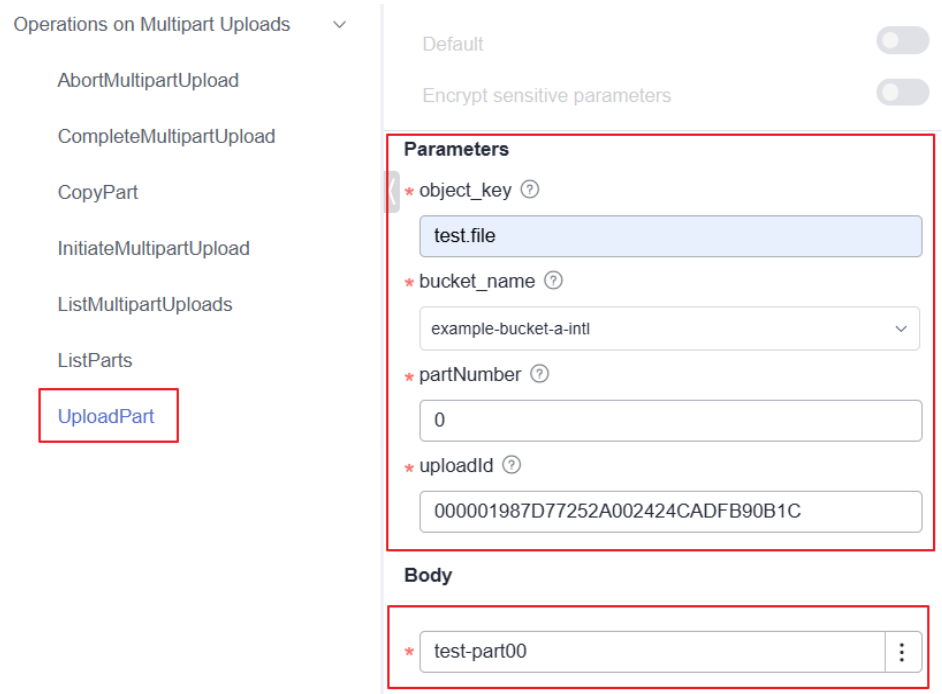
----End

Step 3: Upload Parts

Upload the parts obtained in **Step 1: Split a File into Parts** to the bucket.

Step 1 Go to the **UploadPart** page of API Explorer.

Step 2 Set the API call parameters.



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Parameter	Example Value	Description
object_key	test.file	The name of the object uploaded to the bucket. It refers to the entire object, not to any individual part. Keep this name the same as the one set in **Step 2**.
bucket_name	example-bucket-a-intl	The bucket name. Click ⌄ to choose a bucket that stores your object. Keep this name the same as the one set in **Step 2**.
partNumber	1	The part number. It must be **an integer from 1 to 10000**. A part number uniquely identifies a part and its position. **Parts must be numbered in ascending order according to their position in the object.** For example, if a 20 MB object is split into five parts, the first part is numbered 1, the second part 2, and so on. If you upload a new part using the same part number as a previously uploaded part, the previously uploaded part will be overwritten.
uploadId	000001987D77252A002424CADFB90B1C	The upload ID, which must be the one obtained in **Step 4**.
Body	test-part00	The part to upload. Click ⋮ to select the part to upload.

Step 3 Click **Debug**.

Step 4 After the API call succeeds, verify that a success message appears on the **Debugging Result** tab. The response shown in the lower right corner of the page includes **the ETag value of the part**.

Step 5 Repeat **Step 2** to **Step 3** to upload all parts.

Step 6 After the upload is complete, go to the **ListParts** page, set parameters, and click **Debug** to list all uploaded parts.

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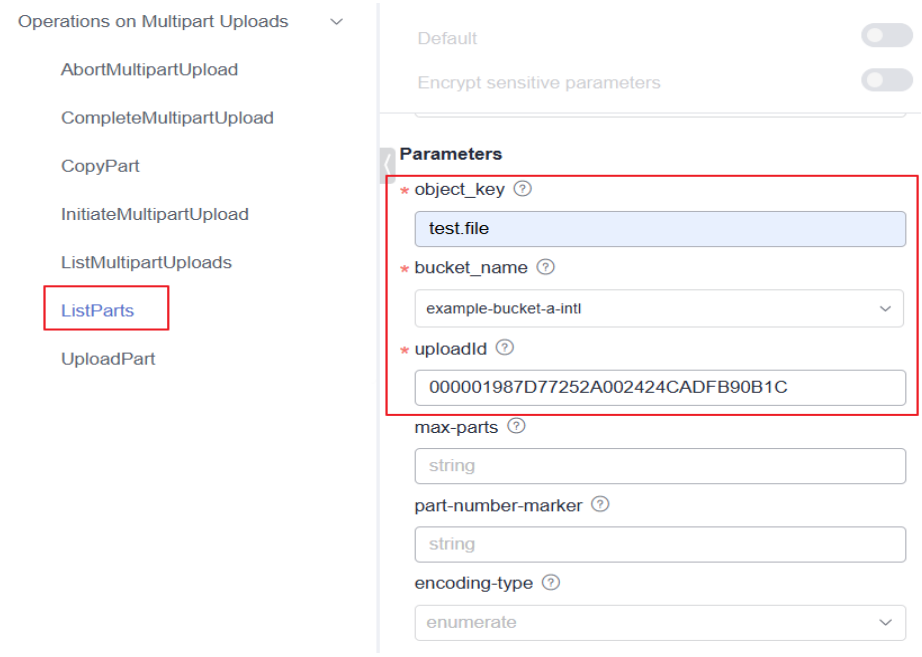

Parameter	Example Value	Description
object_key	test.file	The name of the object uploaded to the bucket. It refers to the entire object, not to any individual part. Keep this name the same as the one set in **Step 2**.
bucket_name	example-bucket-a-intl	The bucket name. Click ⌄ to choose a bucket that stores your object. Keep this name the same as the one set in **Step 2**.
uploadId	000001987D77252A002424CADFB90B1C	The upload ID, which must be the one obtained in **Step 4**.

Step 7 Verify that all parts have been uploaded successfully and obtain the part numbers and ETag values of all parts.

If the response result in **Step 6** contains all parts, the parts have been uploaded successfully. In this case, **record the part numbers and ETag values of all parts**. The recorded data will be used as the request parameters for **completing the multipart upload in the next step**.

----End

Step 4: Complete the Multipart Upload

This step assembles the uploaded parts into an object.

Step 1 Go to the **CompleteMultipartUpload** page of API Explorer.

Step 2 Set the API call parameters.

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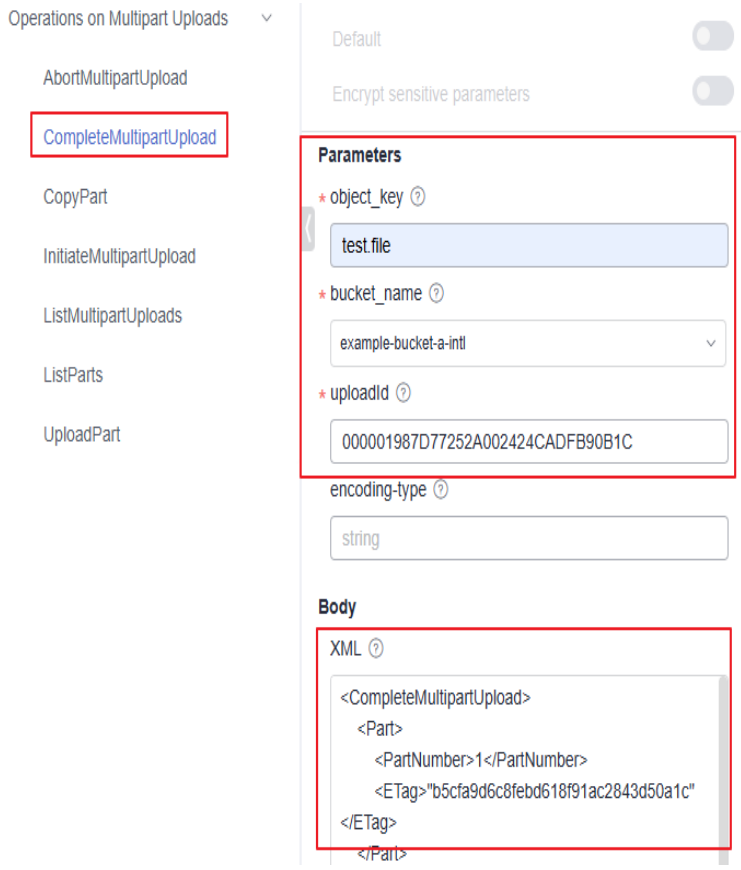

Parameter	Example Value	Description
object_key	test.file	The name of the object uploaded to the bucket. It refers to the entire object, not to any individual part. Keep this name the same as the one set in **Step 2**.
bucket_name	example-bucket-a-intl	The bucket name. Click ⌄ to choose a bucket that stores your object. Keep this name the same as the one set in **Step 2**.
uploadId	000001987D77252A002424CADFB90B1C	The upload ID, which must be the one obtained in **Step 4**.

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Parameter	Example Value	Description
Body	<CompleteMultipartUpload> <Part> <PartNumber>1</PartNumber> <ETag>"ef0bff811bdb99fb44804719bd0f6877"</ETag> </Part> <Part> <PartNumber>2</PartNumber> <ETag>"ef0bff811bdb99fb44804719bd0f6877"</ETag> </Part> <Part> <PartNumber>3</PartNumber> <ETag>"ef0bff811bdb99fb44804719bd0f6877"</ETag> </Part> <Part> <PartNumber>4</PartNumber> <ETag>"ef0bff811bdb99fb44804719bd0f6877"</ETag> </Part> <Part> <PartNumber>5</PartNumber> <ETag>"ef0bff811bdb99fb44804719bd0f6877"</ETag> </Part> </CompleteMultipartUpload>	The body must include the part numbers and ETag values of all parts. You can obtain the data by making a **ListParts** API call after all parts have been uploaded. For details, see **Step 7**. Alternatively, you can obtain the ETag value of each part from its upload response. For details, see **Step 4**. **CAUTION** If a part is omitted when a multipart upload is completed, the part will be deleted and cannot be recovered. For example, if 10 parts are uploaded but only nine are assembled, the omitted part will be deleted and cannot be recovered. Therefore, before completing a multipart upload, list all uploaded parts and make sure that no part is omitted.

Step 3 Click **Debug**.

Step 4 After the API call succeeds, verify that a success message appears on the **Debugging Result** tab. The response includes the object name, bucket name, and ETag value of the complete object.

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Response

Header Body

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<CompleteMultipartUploadResult  xmlns="http://obs.myhwclouds.com/doc/2015-06-30
    <Location>/example-bucket-a-intl/test.file</Location>
    <Bucket>example-bucket-a-intl</Bucket>
    <Key>test.file</Key>
    <ETag>"30abbdb6545410956176594e5fcd094f-5"</ETag>
</CompleteMultipartUploadResult>
```

----End

Ways to Upload

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to upload objects.

To improve the upload success rate, **OBS Console** automatically uses multipart upload for objects larger than 8 MB, and OBS Browser+ and obsutil automatically use resumable upload (essentially multipart upload) for objects larger than 50 MB. You will not perceive any backend switchovers, as your operations on OBS Console or tools remain unchanged.

Using OBS Console

Step 1 In the navigation pane of OBS **Console**, choose **Object Storage**.

Step 2 In the bucket list of **OBS Console**, click the desired bucket to go to the **Objects** page.

Step 3 On the object list page, click **Upload Object**.

You can also go to the folder that the file is to be uploaded to and click **Upload Object**.

Batch upload is used as an example here. If a region only supports single upload, follow the on-screen instructions.

NOTE

If the files that you want to upload to OBS are stored in Microsoft OneDrive, it is recommended that the names of these files contain a maximum of 32 characters to ensure compatibility.

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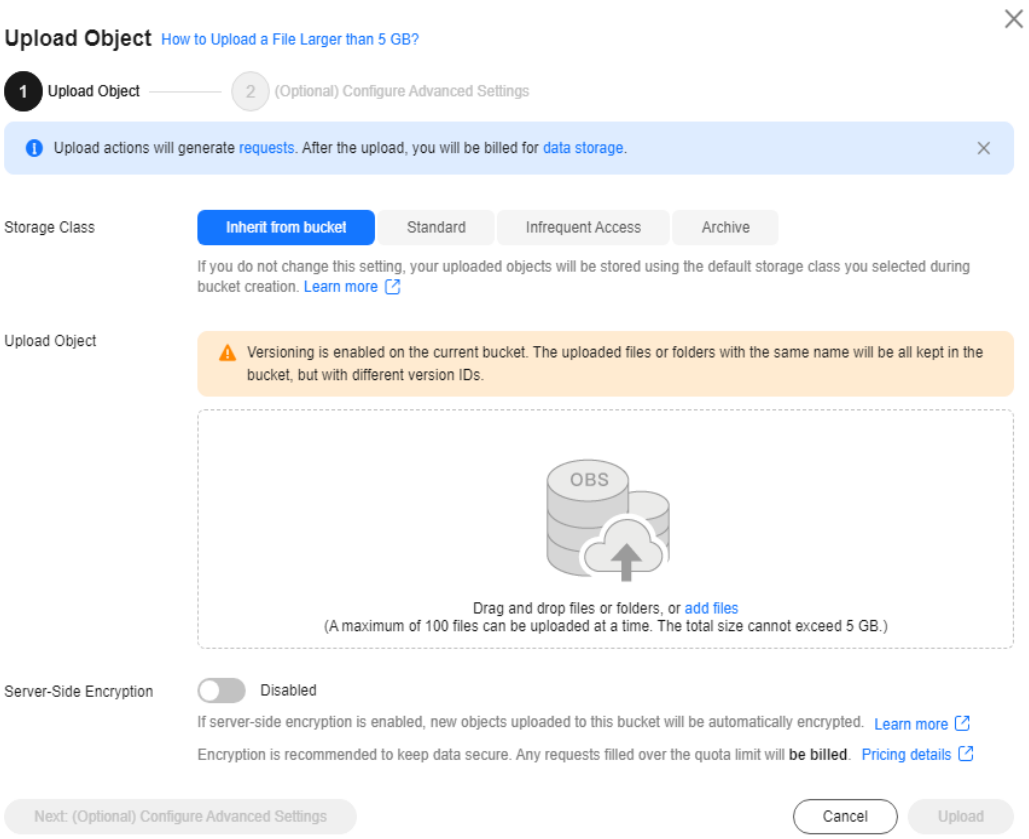
Figure 4-5 Uploading objects



Step 4 Select a storage class. If you do not specify a storage class, the objects you upload inherit the default storage class of the bucket.

NOTE

An object can have a different storage class from its bucket. By default, an object inherits the storage class of the bucket where it is uploaded. You can specify a storage class for an object when uploading it, or you can change the object storage class after the object is uploaded.

Step 5 Drag and drop the files or folders you want to upload to the **Upload Object** area.

You can also click **add files** in the **Upload Object** area to select files.

Step 6 **Server-Side Encryption**: Disable it or choose **SSE-KMS** or **SSE-OBS**. For details, see **Server-Side Encryption Overview**.

NOTE

If your bucket has **server-side encryption** enabled, you can select **Inherit from bucket** when uploading an object.

Step 7 (Optional) To configure metadata, or retention policies, or object tags, click **Next: (Optional) Configure Advanced Settings**.

NOTE

WORM retention policies can be configured in the advanced settings only when WORM is enabled for the bucket.

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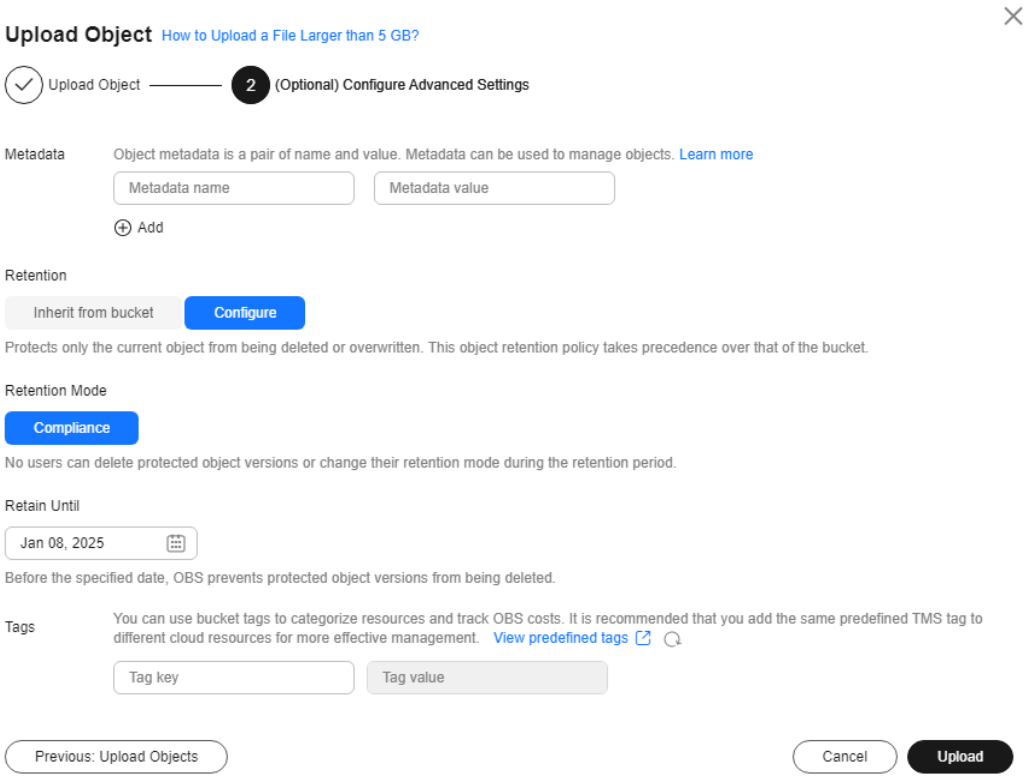
Configuring metadata: Add metadata ContentDisposition, ContentLanguage, WebsiteRedirectLocation, ContentEncoding, or ContentType as needed. For more information, see **OBS Metadata**. Metadata is a set of name-value pairs. The metadata value cannot be left blank. You can add multiple metadata entries by clicking **Add**.

Configuring retention: Choose **Inherit from bucket**, or choose **Configure** and then specify a retention period, to automatically protect new objects uploaded to the bucket from being deleted before the specified date.

Configuring tags: Tags are used to identify objects with tag keys and values. For details, see **Adding Tags to an Object**.

Figure 4-6 Configuring metadata or WORM retention



Step 8 Click **Upload**.

----End

Using APIs

Operations on Multipart Upload

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the GUI Tool - OBS Browser+

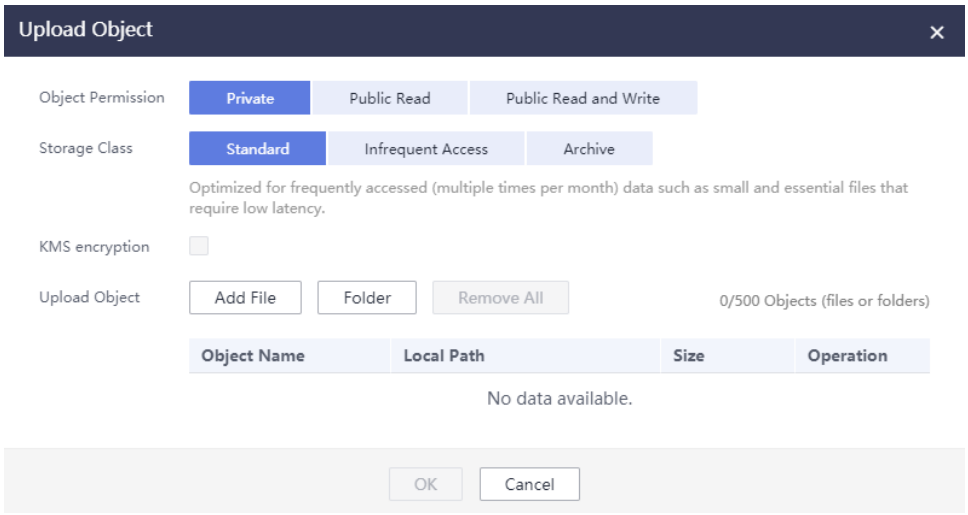
OBS Browser+ automatically uses resumable upload (essentially multipart upload) for objects larger than 50 MB in the background.

Step 1 Log in to OBS Browser+.

Step 2 Click the bucket where you want to upload files or folders.

Step 3 Click **Upload** and then **Add File** or **Folder**, as shown in **Figure 4-7**.

Figure 4-7 Uploading a file or folder



For better experience when using the **Add File** function, you are advised to upload a maximum of 100 files at a time. If you need to upload more, place all the files in a folder and upload them by adding a folder.

NOTE

1. If message "Service Unavailable" is displayed when files are being uploaded, try again later.
2. If an access deny message is displayed when you are uploading a file or folder, possible causes are as follows:

- Access to the bucket is restricted by an ACL. For example, you do not have the write permission for the bucket.
- Access to the bucket is restricted by a bucket policy. For example, you do not have the write permission for the bucket, or write operations cannot be performed on the bucket during the current period.

  If such message is displayed, check ACL and policy settings of the bucket and resolve the problem accordingly.

CAUTION

You must have access to the file you want to upload, or the file upload will fail.

Step 4 In the displayed dialog box, select the file or folder you want to upload and click **Open**.

You can upload one folder or multiple files at a time. To upload multiple files, hold down **Ctrl** or **Shift** to select multiple files and batch upload them. You can also

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press **Ctrl+A** to select all files. The operations are consistent with those in Windows operating systems.

Step 5 Click **OK**.

----End

Using the CLI Tool - obsutil

obsutil automatically uses resumable upload (essentially multipart upload) for objects larger than 50 MB in the background.

Command Line Structure

- In Windows
  - Uploading a file
    ```
    obsutil cp file_url obs://bucket[/key] [-arcDir=xxx] [-dryRun] [-link] [-u] [-vlength] [-vmd5] [-p=1] [-threshold=5248800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-o=xxx] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Uploading a folder
    ```
    obsutil cp folder_url obs://bucket[/key] -r [-arcDir=xxx] [-dryRun] [-link] [-f] [-flat] [-u] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Uploading multiple files/folders
    ```
    obsutil cp file1_url,folder1_url|filelist_url obs://bucket[/prefix] -msm=1 [-r] [-arcDir=xxx] [-dryRun] [-link] [-f] [-u] [-vlength] [-vmd5] [-flat] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx][-timeRange=time1-time2] [-at] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

    NOTE

    In this command, **/prefix** is the name prefix for uploading folders. For more examples, see **Upload**.
- In Linux or macOS
  - Uploading a file
    ```
    ./obsutil cp file_url obs://bucket[/key] [-arcDir=xxx] [-dryRun] [-link] [-u] [-vlength] [-vmd5] [-p=1] [-threshold=5248800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-o=xxx] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Uploading a folder
    ```
    ./obsutil cp folder_url obs://bucket[/key] -r [-arcDir=xxx] [-dryRun] [-link] [-f] [-flat] [-u] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-at] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Uploading multiple files/folders
    ```
    ./obsutil cp file1_url,folder1_url|filelist_url obs://bucket[/prefix] -msm=1 [-r] [-arcDir=xxx] [-dryRun] [-link] [-f] [-u] [-vlength] [-vmd5] [-flat] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx][-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

    NOTE

    In this command, **/prefix** is the name prefix for uploading folders. For more examples, see **Upload**.

Examples

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- Take the Windows OS as an example. Run the **obsutil cp d:\temp\test.txt obs://bucket-test/key** command to upload the **test.txt** file in the **temp** directory in the **D:** drive to bucket **bucket-test** and rename the file as **key**.

```
obsutil cp d:\temp\test.txt obs://bucket-test/key
Start at 2024-09-30 08:11:41.6724827 +0000 UTC

Parallel:      5                 Jobs:         5
Threshold:     50.00MB           PartSize:     auto
VerifyLength:  false             VerifyMd5:    false
CheckpointDir: C:\Users\Administrator\.obsutil_checkpoint

[=================================================] 100.00% 1.68 MB/s 8.46MB/
8.46MB 5s
Upload successfully, 8.46MB, n/a, d:\temp\test.txt --> obs://bucket-test/key, cost [5], status [200],
request id [0000016979E1D2B2860BB5181229C72C]
```

- Take the Windows OS as an example. Run the **obsutil cp d:\temp obs://bucket-test -f -r** command to recursively upload all files and subfolders in the **temp** directory in the **D:** drive to the **temp** folder in bucket **bucket-test**.

```
obsutil cp d:\temp obs://bucket-test -f -r
Start at 2024-09-30 08:14:12.1406275 +0000 UTC

Parallel:      5                 Jobs:         5
Threshold:     50.00MB           PartSize:     auto
VerifyLength:  false             VerifyMd5:    false
CheckpointDir: C:\Users\Administrator\.obsutil_checkpoint

Task id: 104786c8-27c2-48fc-bc6a-5886596fb0ed
OutputDir: C:\Users\Administrator\.obsutil_output

[=================================================] 100.00% tps:35.71 2.02 KB/s
7.20MB/7.20MB 0s
Succeed count:   5       Failed count:    0
Succeed bytes:     xxx
Metrics [max cost:90 ms, min cost:45 ms, average cost:63.80 ms, average tps:35.71, transferred size:
7.20MB]

Task id: 104786c8-27c2-48fc-bc6a-5886596fb0ed
```

- For more examples, see **Common Examples**.

Parameter Description

Parameter	Optional or Mandatory	Description
file_url	Optional for uploading multiple files/folders Mandatory for uploading a file	The local file path • Do not nest paths when uploading multiple files/folders. For example, you cannot specify **/a/b/c** and **/a/b/** at the same time. • If this parameter is configured when uploading multiple files/folders, **msm** must be set to **1**. In this case, use commas (,) to separate multiple file paths, for example, **file_url1,file_url2**. • Files and folders can both be included when uploading multiple files/folders. For example, **file_url1,folder_url1,file_url2,folder_url2**.

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Parameter	Optional or Mandatory	Description
folder_url	Optional for uploading multiple files/folders Mandatory for uploading a folder	The local folder path • If **flat** is not configured when uploading a folder, the entire folder is uploaded. If **flat** is configured, all files in the folder are uploaded. • Do not nest paths when uploading multiple files/folders. For example, you cannot specify **/a/b/c** and **/a/b/** at the same time. • If this parameter is configured when uploading multiple files/folders, **msm** must be set to **1**. In this case, use commas (,) to separate multiple folder paths, for example, **folder_url1,folder_url2**. • Files and folders can both be included when uploading multiple files/folders. For example, **file_url1,folder_url1,file_url2,folder_url2**.
filelist_url	Optional for uploading multiple files/folders	The path of the file that contains the list of files/folders to be uploaded. If this parameter is configured, **msm** must be set to **2**. • The list file is in common text file formats, such as TXT and CSV. Each line in the file indicates a file or folder to be uploaded. For example: file_url1 file_url2 folder_url1 folder_url2 • Do not nest paths in the list file. For example, you cannot specify **/a/b/c** and **/a/b/** at the same time.
bucket	Mandatory	The name of the bucket where you will upload the file or folder

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Parameter	Optional or Mandatory	Description
key	Optional	The object name or object name prefix specified when uploading a file, or the object name prefix specified when uploading a folder When uploading a file or folder, the upload path and name change depending on the value of this parameter. The specific rules are as follows: • If this parameter is left blank, the object is uploaded to the root directory of the bucket, and the object name is the name of the uploaded file or folder. • If this parameter is specified: – If the parameter value ends with a slash (/), the object is uploaded to the directory indicated by this value, and the object name is the parameter value plus the file name, for example, **folder/filename.txt** or **folder/foldername**. – If the parameter value does not end with a slash (/), the object name for the file is the parameter value, for example, **filename.txt**, and the object name for the folder is the parameter value plus a slash (/), for example, **folder/**, which is also the name of the directory where the folder is uploaded. **NOTE** For details about how to use this parameter, see **Upload**.
fr	Optional for uploading a file (additional parameter)	Generates an operation result file when uploading a file.
flat	Optional for uploading a folder or multiple files/folders (additional parameter)	Uploads all files in a folder but not the folder itself.
arcDir	Optional (additional parameter)	The path to which the uploaded files are archived
dryRun	Optional (additional parameter)	Conducts a dry run.

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Parameter	Optional or Mandatory	Description
link	Optional (additional parameter)	The actual path of a symbolic link for a file or folder • If this parameter is not specified and the file to be uploaded is a symbolic-link file whose target file does not exist, the exception message "The system cannot find the file specified" will be displayed in Windows OS, while the exception message "No such file or directory" will be displayed in macOS or Linux OS. • Avoid the symbolic link loop of a folder, otherwise, the upload will exit due to panic. If you do not want the system to panic, set **panicForSymbolicLinkCircle** to **false** in the configuration file.
u	Optional (additional parameter)	Indicates incremental upload. If this parameter is set, each file can be uploaded only when it does not exist in the bucket, its size is different from the namesake one in the bucket, or it has the latest modification time. **When you compare each local file with data in the bucket, a billable HEAD request is generated. For details, see Requests.**
vlength	Optional (additional parameter)	After the upload completes, checks whether the sizes of the objects in the bucket are the same as those of the local files.
vmd5	Optional (additional parameter)	After the upload completes, checks whether the MD5 values of the objects in the bucket are the same as those of the local files. • **If your object needs encryption, do not use this parameter.** • If the size of the file or folder to be uploaded is too large, using this parameter will degrade the overall performance due to MD5 calculation. • After the MD5 verification is successful, this parameter value is used for metadata **x-obs-meta-md5chksum**, for later MD5 verification during download or copy.
p	Optional (additional parameter)	The maximum number of concurrent uploads for a multipart upload The default value is the value of **defaultParallels** in the configuration file.

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Parameter	Optional or Mandatory	Description
threshold	Optional (additional parameter)	The threshold for enabling multipart upload. If the size of the file or folder to be uploaded is smaller than the threshold, upload it directly. Otherwise, a multipart upload is required. The default value is the value of **defaultBigfileThreshold** in the configuration file. Unit: byte This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes). **NOTE** If you upload a file or folder directly, no part record is generated, and resumable transmission is not supported.
acl	Optional (additional parameter)	The access control policies that can be specified for objects when uploading files. Possible values are: • **private**: Only users granted permissions by the object ACL can access the object. • **public-read**: Anyone can read objects in the bucket. • **public-read-write**: Anyone can read, write, or delete objects in the bucket. • **bucket-owner-full-control**: Only the bucket owner has full control over objects in the bucket.

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Parameter	Optional or Mandatory	Description
sc	Optional (additional parameter)	The storage classes of objects that can be specified when uploading files Possible values are: • **standard**: Standard storage class. It features low access latency and high throughput, and is applicable to storing frequently accessed data (multiple accesses per month) or data that is smaller than 1 MB. • **warm**: Infrequent Access storage class. It is ideal for storing infrequently accessed (less than 12 times a year) data, but when needed, the access has to be fast. • **cold**: Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once a year) data. • **deep-archive**: Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely (once every few years) accessed. This storage class costs less than the Archive storage class, but takes longer time (usually several hours) to restore data.
meta	Optional (additional parameter)	The standard or user-defined metadata that can be specified during file upload • Standard metadata includes **Content-Type**, **Content-Encoding**, **Cache-Control**, **Content-Disposition**, **Content-Language** and **Expires**. • User-defined metadata must be in the format of *key:value*. Multiple user-defined metadata items are separated by number signs (#), for example, *key1:value1*#*key2:value2*#*key3:value3*, which indicates that the file uploaded to the bucket contains three groups of user-defined metadata: *key1:value1*, *key2:value2*, and *key3:value3*.

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Parameter	Optional or Mandatory	Description
ps	Optional (additional parameter)	The size of each part in a multipart upload task • The default value is the value of **defaultPartSize** in the configuration file. The parameter can be set to **auto**. In this case, obsutil automatically configures the part size for each multipart task based on the source file size. • Range: **100KB** to **5GB** • Unit: byte. This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes).
cpd	Optional (additional parameter)	The folder where the part records reside. The default value is **.obsutil_checkpoint**, the subfolder in the home directory of the user who executes obsutil commands. A part record is generated during a multipart upload and saved to the **upload** subfolder. After the upload succeeds, its part record is deleted automatically. If the upload fails or is suspended, the system attempts to resume the task according to its part record when you perform the upload the next time.
r	Mandatory for uploading a folder (additional parameter) Optional for uploading multiple files/ folders	Recursively uploads all files and subfolders within a folder.
f	Optional for uploading a folder or multiple files/ folders (additional parameter)	Runs in force mode.
j	Optional for uploading a folder or multiple files/ folders (additional parameter)	The maximum number of concurrent tasks for uploading a folder. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.

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Parameter	Optional or Mandatory	Description
msm	Mandatory for uploading multiple files/ folders (additional parameter)	Enables the mode for uploading multiple files/folders. Possible values are **1** and **2**. ● If **msm** is set to **1**, the source URL indicates a list of file/folder names separated by commas. ● If **msm** is set to **2**, the source URL indicates a file containing a list of file/folder names. ● If the file or folder name already contains commas (,), do not set **msm** to **1**. ● If parameter **r** is not set, the folders in the list will not be uploaded.
exclude	Optional for uploading a folder or multiple files/ folders (additional parameter)	The file matching patterns that are excluded. After this parameter is specified, if the name of the file to be uploaded matches the value of this parameter, the file is skipped. For example, if this parameter is set to ***.txt**, all files whose names end with **.txt** are skipped and not uploaded. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent ***** and **\?** to represent **?**. ● Multiple **exclude** parameters can be specified, for example, **-exclude=*.xxx -exclude=*.xxx**. **Restrictions**: The matching pattern takes effect only for files in the folder. **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute file path (including the file name and file directory).

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Parameter	Optional or Mandatory	Description
include	Optional for uploading a folder or multiple files/ folders (additional parameter)	The file matching patterns that are included. After this parameter is specified, if the name of the file to be uploaded matches the value of this parameter, the file is uploaded. For example, if this parameter is set to ***.txt**, all files whose names end with **.txt** are uploaded. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent * and **\?** to represent **?**. ● Multiple **include** parameters can be specified, for example, **-include=*.xxx -include=*.xxx**. **Restrictions**: ● The matching pattern takes effect only for files in the folder. ● If both the **exclude** and **include** parameters are configured, the **exclude** rules are applied first. If the name of a file to be uploaded does not match **exclude**, OBS checks whether the file name matches **include**. If yes, the file is uploaded. If no, the file is skipped. **Example:** `./obsutil cp /localpath/ obs://test/ -include=/localpath/2022-12-09/* -f -r` This command uploads files that are under **localpath** and start with **/localpath/2022-12-09/** to bucket **test**. **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute file path (including the file name and file directory).

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Parameter	Optional or Mandatory	Description
at	Optional for uploading a folder or multiple files/ folders (additional parameter)	Indicates that only the files whose latest access time is within the value of **timeRange** are uploaded. This parameter must be used together with **timeRange**.
disableDirObject	Optional for uploading multiple folders (additional parameter)	Indicates the folders themselves are not uploaded as an object. Configuring this parameter can avoid uploading empty folders to a bucket. If a folder contains files, the files will be uploaded and the original path format is retained.
timeRange	Optional for uploading a folder or multiple files/ folders (additional parameter)	The time range matching pattern when uploading files. Only files whose latest modification time is within the configured time range are uploaded. This pattern has a lower priority than the file matching patterns (**exclude**/**include**). That is, the time range matching pattern is executed after the configured file matching patterns. ● Time in the matching pattern is the UTC time. ● The matching time range is represented in *time1*-*time2*, where *time1* must be earlier than or the same as *time2*. The time format is *yyyyMMddHHmmss*. ● Automatic formatting is supported. For example, *yyyyMMdd* is equivalent to *yyyyMMdd***000000**, and *yyyyMM* is equivalent to *yyyyMM***01000000**. ● If this parameter is set to ***-***time2*, all files whose last modification time is earlier than *time2* are matched. If it is set to *time1*-*, all files whose last modification time is later than *time1* are matched.
mf	Optional (additional parameter)	Indicates that the name matching pattern (**include** or **exclude**) and the time matching pattern (**timeRange**) also take effect on folders.

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Parameter	Optional or Mandatory	Description
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (possibly success, failure, and warning files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. • A result file should be named as follows: **cp_{succeed | failed | warning}_report**_*time*_*TaskId*.**txt**. • By default, the maximum size of a single result file is 30 MB. You can set the maximum size by configuring **recordMaxLogSize** in the configuration file. • By default, the maximum number of result files that can be retained is 1,024. You can set the maximum number by configuring **recordBackups** in the configuration file. • If there are multiple folders and files and you need to confirm the details of a failed task, refer to the failure result file **cp_failed_report**_*time*_*TaskId*.**txt** in the result folder and the **log files** in the log path.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Response

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Field	Description
Parallel	The parameter **-p** in the request
Jobs	The parameter **-j** in the request
Threshold	The parameter **-threshold** in the request
PartSize	The parameter **-ps** in the request
Exclude	The parameter **-exclude** in the request
Include	The parameter **-include** in the request
TimeRange	The parameter **-timeRange** in the request
VerifyLength	The parameter **-vlength** in the request
VerifyMd5	The parameter **-vmd5** in the request
CheckpointDir	The parameter **-cpd** in the request
OutputDir	The parameter **-o** in the request
ArcDir	The parameter **-arcDir** in the request
Succeed count	The number of successful tasks
Failed count	The number of failed tasks
Skip count	The number of tasks that are skipped during incremental upload, download, or copy, and synchronous upload, download, or copy. **NOTE** Skipped tasks are recorded into successful tasks.
Warning count	The number of tasks that are executed successfully but contain warnings. **NOTE** • The task for which a warning is generated may be a failure or a success, which needs to be further determined according to the corresponding result list. • The number of tasks that generate warnings is independent of the number of successful or failed tasks. The total number of tasks is the number of successful tasks plus the number of failed tasks.
Succeed bytes	The number of bytes that are successfully uploaded or downloaded.
max cost	The maximum duration of all tasks, in ms
min cost	The minimum duration of all tasks, in ms
average cost	The average duration of all tasks, in ms
average tps	The average number of tasks completed per second
Task id	The unique ID of an operation, which is used to search for the result file generated for a batch task

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Related Operations

The following are operations related to multipart upload:

Listing Initiated Multipart Uploads in a Bucket

An initiated multipart upload refers to an upload that has been initiated but not yet completed or aborted.

Principle: The **ListMultipartUploads** API returns all multipart uploads that have been initiated but not yet completed or aborted in a bucket. Each request can return a maximum of **1,000** multipart uploads. If more than 1,000 multipart uploads are in progress, you need to send additional requests to query the remaining uploads.

How to list initiated multipart uploads:

- obsutil: **Listing Multipart Upload Tasks**
- API: **Listing Initiated Multipart Uploads in a Bucket**
- SDKs:

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Listing Uploaded Parts That Have Not Been Assembled

Uploaded parts are the parts that have been uploaded to a bucket but have not yet been assembled.

Principle: OBS lists the uploaded parts that have not yet been assembled. Each request can return up to **1,000** parts. If there are more than 1,000 parts, you must send a series of requests to list all parts. The list of uploaded parts **does not include assembled parts**.

How to list uploaded parts:

- OBS Console:
  a. In the navigation pane of **OBS Console**, choose **Buckets**.
  b. Click the name of the target bucket to go to the **Objects** page.
  c. Click the **Fragments** tab to view all parts in the bucket.
- OBS Browser+: **Managing Fragments**
- API: **Listing Uploaded Parts That Have Not Been Assembled**
- SDKs:

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

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Copying Parts

After initiating a multipart upload, you can specify the upload ID and make a **CopyPart** API call to copy part or all of an uploaded object as a part.

Principle: If **part1** already exists before you copy object **A** to **part1**, the new **part1** will overwrite the original one. After the copy succeeds, only the new **part1** can be listed, and the original **part1** will be deleted. Therefore, before copying a part, ensure that the target part does not exist or is no longer needed. Otherwise, data may be deleted by mistake. Object **A** is not affected during the copy.

How to copy parts:

- obsutil: **Copying an Object**
- API: **Copying Parts**
- SDKs:

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

If the response body contains the ETag value of the part, the part is successfully copied, or the part copy fails. A status code 200 does not indicate a successful copy; it simply means that the server has received the copy request and started to process it.

Aborting a Multipart Upload

Principle: After a multipart upload is aborted, the upload ID cannot be used to upload any part, and OBS will free up the storage space of each part. If any parts are being uploaded when you abort the upload, they may or may not be uploaded successfully. To ensure that the storage space used by all parts is freed up, you are advised to abort the multipart upload after all parts are uploaded.

How to abort a multipart upload:

- obsutil: **Deleting a Multipart Upload Task**
- API: **Canceling a Multipart Upload Task**
- SDKs:

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

References

If you have over 48.8 TB data to upload, refer to **Migrating Local Data to OBS**.

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4.2.5 Resumable Upload

Scenarios

Uploading large files often fails due to poor network conditions or program breakdowns. Re-uploads not only waste resources, but may also fail again. To avoid such issues, you can use the resumable upload API, which works by dividing a file into multiple parts and then uploading them separately. This API helps save resources for re-uploads and improves efficiency by concurrent uploads.

Important Notes

- To upload objects, you must be the bucket owner or have the required permission (**obs:object:PutObject** in IAM or **PutObject** in a bucket policy). For details, see **Introduction to OBS Access Control**, **IAM Custom Policies**, and **Configuring an Object Policy**.
- If you want to know the regions where OBS is available and the mapping between regions and endpoints, refer to **Regions and Endpoints**.
- The file uploaded by the resumable upload API must be larger than 100 KB in size.
- Before using SDK for resumable upload, you must enable the resumable unload option. Only in this way, the progress of the last upload can be read when you continue the upload process again.
- SDKs record the status of resumable uploads in a checkpoint file. Make sure your program has write permissions for the checkpoint file.
- Do not alter the verification data in a checkpoint file. If the checkpoint file is damaged, all parts will be uploaded again.
- If the local file changes during the upload, all parts will be uploaded again.

Ways to Upload

You can use SDKs, OBS Browser+, or obsutil to perform resumable upload for objects. If your resumable upload initiated via an SDK API call fails, you only need to run the relevant code to restart the upload. To improve the upload success rate, OBS Browser+ and obsutil automatically use resumable upload for objects larger than 50 MB. You will not perceive any backend switchovers, as your operations on **OBS Console** or tools keep unchanged. If the upload fails, try again.

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the GUI Tool - OBS Browser+

OBS Browser+ automatically uses resumable upload for objects larger than 50 MB in the background.

Step 1 Log in to OBS Browser+.

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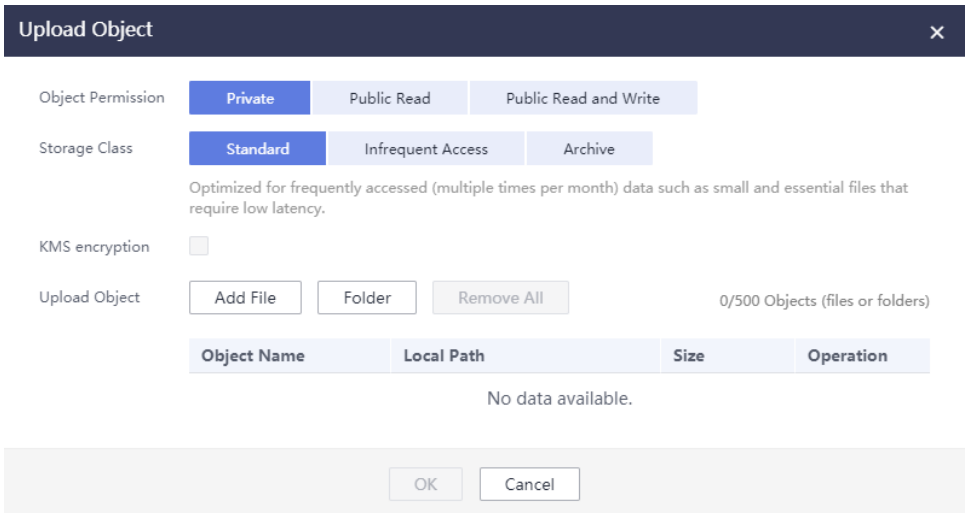
Step 2 Click the bucket where you want to upload files or folders.

Step 3 Click **Upload** and then **Add File** or **Folder**, as shown in **Figure 4-8**.

Figure 4-8 Uploading a file or folder



For better experience when using the **Add File** function, you are advised to upload a maximum of 100 files at a time. If you need to upload more, place all the files in a folder and upload them by adding a folder.

NOTE

1. If message "Service Unavailable" is displayed when files are being uploaded, try again later.
2. If an access deny message is displayed when you are uploading a file or folder, possible causes are as follows:

- Access to the bucket is restricted by an ACL. For example, you do not have the write permission for the bucket.
- Access to the bucket is restricted by a bucket policy. For example, you do not have the write permission for the bucket, or write operations cannot be performed on the bucket during the current period.

  If such message is displayed, check ACL and policy settings of the bucket and resolve the problem accordingly.

CAUTION

You must have access to the file you want to upload, or the file upload will fail.

Step 4 In the displayed dialog box, select the file or folder you want to upload and click **Open**.

You can upload one folder or multiple files at a time. To upload multiple files, hold down **Ctrl** or **Shift** to select multiple files and batch upload them. You can also press **Ctrl+A** to select all files. The operations are consistent with those in Windows operating systems.

Step 5 Click **OK**.

----End

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Using the CLI Tool - obsutil

obsutil automatically uses resumable upload for objects larger than 50 MB in the background.

Command Line Structure

- In Windows
  - Uploading a file
    ```
    obsutil cp file_url obs://bucket[/key] [-arcDir=xxx] [-dryRun] [-link] [-u] [-vlength] [-vmd5] [-p=1] [-threshold=5248800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-o=xxx] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Uploading a folder
    ```
    obsutil cp folder_url obs://bucket[/key] -r [-arcDir=xxx] [-dryRun] [-link] [-f] [-flat] [-u] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Uploading multiple files/folders
    ```
    obsutil cp file1_url,folder1_url|filelist_url obs://bucket[/prefix] -msm=1 [-r] [-arcDir=xxx] [-dryRun] [-link] [-f] [-u] [-vlength] [-vmd5] [-flat] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx][-timeRange=time1-time2] [-at] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

    NOTE

    In this command, **/prefix** is the name prefix for uploading folders. For more examples, see **Upload**.
- In Linux or macOS
  - Uploading a file
    ```
    ./obsutil cp file_url obs://bucket[/key] [-arcDir=xxx] [-dryRun] [-link] [-u] [-vlength] [-vmd5] [-p=1] [-threshold=5248800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-o=xxx] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Uploading a folder
    ```
    ./obsutil cp folder_url obs://bucket[/key] -r [-arcDir=xxx] [-dryRun] [-link] [-f] [-flat] [-u] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-at] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Uploading multiple files/folders
    ```
    ./obsutil cp file1_url,folder1_url|filelist_url obs://bucket[/prefix] -msm=1 [-r] [-arcDir=xxx] [-dryRun] [-link] [-f] [-u] [-vlength] [-vmd5] [-flat] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx][-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

    NOTE

    In this command, **/prefix** is the name prefix for uploading folders. For more examples, see **Upload**.

Examples

- Take the Windows OS as an example. Run the **obsutil cp d:\temp\test.txt obs://bucket-test/key** command to upload the **test.txt** file in the **temp** directory in the **D:** drive to bucket **bucket-test** and rename the file as **key**.
  ```
  obsutil cp d:\temp\test.txt obs://bucket-test/key
  Start at 2024-09-30 08:11:41.6724827 +0000 UTC

  Parallel:      5                 Jobs:         5
  Threshold:     50.00MB           PartSize:     auto
  VerifyLength:  false             VerifyMd5:    false
  CheckpointDir: C:\Users\Administrator\.obsutil_checkpoint
  ```

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```
[====================================================] 100.00% 1.68 MB/s 8.46MB/
8.46MB 5s
Upload successfully, 8.46MB, n/a, d:\temp\test.txt --> obs://bucket-test/key, cost [5], status [200],
request id [0000016979E1D2B2860BB5181229C72C]
```

- Take the Windows OS as an example. Run the **obsutil cp d:\temp obs://bucket-test -f -r** command to recursively upload all files and subfolders in the **temp** directory in the **D:** drive to the **temp** folder in bucket **bucket-test**.

```
obsutil cp d:\temp obs://bucket-test -f -r
Start at 2024-09-30 08:14:12.1406275 +0000 UTC

Parallel:      5                 Jobs:         5
Threshold:     50.00MB           PartSize:     auto
VerifyLength:  false             VerifyMd5:    false
CheckpointDir: C:\Users\Administrator\.obsutil_checkpoint

Task id: 104786c8-27c2-48fc-bc6a-5886596fb0ed
OutputDir: C:\Users\Administrator\.obsutil_output

[====================================================] 100.00% tps:35.71 2.02 KB/s
7.20MB/7.20MB 0s
Succeed count:   5        Failed count:    0
Succeed bytes:     xxx
Metrics [max cost:90 ms, min cost:45 ms, average cost:63.80 ms, average tps:35.71, transferred size:
7.20MB]

Task id: 104786c8-27c2-48fc-bc6a-5886596fb0ed
```

- For more examples, see **Common Examples**.

Parameter Description

Parameter	Optional or Mandatory	Description
file_url	Optional for uploading multiple files/folders Mandatory for uploading a file	The local file path • Do not nest paths when uploading multiple files/folders. For example, you cannot specify **/a/b/c** and **/a/b/** at the same time. • If this parameter is configured when uploading multiple files/folders, **msm** must be set to **1**. In this case, use commas (,) to separate multiple file paths, for example, **file_url1,file_url2**. • Files and folders can both be included when uploading multiple files/folders. For example, **file_url1,folder_url1,file_url2,folder_url2**.

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Parameter	Optional or Mandatory	Description
folder_url	Optional for uploading multiple files/folders Mandatory for uploading a folder	The local folder path • If **flat** is not configured when uploading a folder, the entire folder is uploaded. If **flat** is configured, all files in the folder are uploaded. • Do not nest paths when uploading multiple files/folders. For example, you cannot specify **/a/b/c** and **/a/b/** at the same time. • If this parameter is configured when uploading multiple files/folders, **msm** must be set to **1**. In this case, use commas (,) to separate multiple folder paths, for example, **folder_url1,folder_url2**. • Files and folders can both be included when uploading multiple files/folders. For example, **file_url1,folder_url1,file_url2,folder_url2**.
filelist_url	Optional for uploading multiple files/folders	The path of the file that contains the list of files/folders to be uploaded. If this parameter is configured, **msm** must be set to **2**. • The list file is in common text file formats, such as TXT and CSV. Each line in the file indicates a file or folder to be uploaded. For example: file_url1 file_url2 folder_url1 folder_url2 • Do not nest paths in the list file. For example, you cannot specify **/a/b/c** and **/a/b/** at the same time.
bucket	Mandatory	The name of the bucket where you will upload the file or folder

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Parameter	Optional or Mandatory	Description
key	Optional	The object name or object name prefix specified when uploading a file, or the object name prefix specified when uploading a folder When uploading a file or folder, the upload path and name change depending on the value of this parameter. The specific rules are as follows: • If this parameter is left blank, the object is uploaded to the root directory of the bucket, and the object name is the name of the uploaded file or folder. • If this parameter is specified: – If the parameter value ends with a slash (/), the object is uploaded to the directory indicated by this value, and the object name is the parameter value plus the file name, for example, **folder/filename.txt** or **folder/foldername**. – If the parameter value does not end with a slash (/), the object name for the file is the parameter value, for example, **filename.txt**, and the object name for the folder is the parameter value plus a slash (/), for example, **folder/**, which is also the name of the directory where the folder is uploaded. **NOTE** For details about how to use this parameter, see **Upload**.
fr	Optional for uploading a file (additional parameter)	Generates an operation result file when uploading a file.
flat	Optional for uploading a folder or multiple files/folders (additional parameter)	Uploads all files in a folder but not the folder itself.
arcDir	Optional (additional parameter)	The path to which the uploaded files are archived
dryRun	Optional (additional parameter)	Conducts a dry run.

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Parameter	Optional or Mandatory	Description
link	Optional (additional parameter)	The actual path of a symbolic link for a file or folder • If this parameter is not specified and the file to be uploaded is a symbolic-link file whose target file does not exist, the exception message "The system cannot find the file specified" will be displayed in Windows OS, while the exception message "No such file or directory" will be displayed in macOS or Linux OS. • Avoid the symbolic link loop of a folder, otherwise, the upload will exit due to panic. If you do not want the system to panic, set **panicForSymbolicLinkCircle** to **false** in the configuration file.
u	Optional (additional parameter)	Indicates incremental upload. If this parameter is set, each file can be uploaded only when it does not exist in the bucket, its size is different from the namesake one in the bucket, or it has the latest modification time. **When you compare each local file with data in the bucket, a billable HEAD request is generated. For details, see Requests.**
vlength	Optional (additional parameter)	After the upload completes, checks whether the sizes of the objects in the bucket are the same as those of the local files.
vmd5	Optional (additional parameter)	After the upload completes, checks whether the MD5 values of the objects in the bucket are the same as those of the local files. • **If your object needs encryption, do not use this parameter.** • If the size of the file or folder to be uploaded is too large, using this parameter will degrade the overall performance due to MD5 calculation. • After the MD5 verification is successful, this parameter value is used for metadata **x-obs-meta-md5chksum**, for later MD5 verification during download or copy.
p	Optional (additional parameter)	The maximum number of concurrent uploads for a multipart upload The default value is the value of **defaultParallels** in the configuration file.

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Parameter	Optional or Mandatory	Description
threshold	Optional (additional parameter)	The threshold for enabling multipart upload. If the size of the file or folder to be uploaded is smaller than the threshold, upload it directly. Otherwise, a multipart upload is required. The default value is the value of **defaultBigfileThreshold** in the configuration file. Unit: byte This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes). **NOTE** If you upload a file or folder directly, no part record is generated, and resumable transmission is not supported.
acl	Optional (additional parameter)	The access control policies that can be specified for objects when uploading files. Possible values are: • **private**: Only users granted permissions by the object ACL can access the object. • **public-read**: Anyone can read objects in the bucket. • **public-read-write**: Anyone can read, write, or delete objects in the bucket. • **bucket-owner-full-control**: Only the bucket owner has full control over objects in the bucket.

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Parameter	Optional or Mandatory	Description
sc	Optional (additional parameter)	The storage classes of objects that can be specified when uploading files Possible values are: • **standard**: Standard storage class. It features low access latency and high throughput, and is applicable to storing frequently accessed data (multiple accesses per month) or data that is smaller than 1 MB. • **warm**: Infrequent Access storage class. It is ideal for storing infrequently accessed (less than 12 times a year) data, but when needed, the access has to be fast. • **cold**: Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once a year) data. • **deep-archive**: Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely (once every few years) accessed. This storage class costs less than the Archive storage class, but takes longer time (usually several hours) to restore data.
meta	Optional (additional parameter)	The standard or user-defined metadata that can be specified during file upload • Standard metadata includes **Content-Type**, **Content-Encoding**, **Cache-Control**, **Content-Disposition**, **Content-Language** and **Expires**. • User-defined metadata must be in the format of *key:value*. Multiple user-defined metadata items are separated by number signs (#), for example, *key1:value1*#*key2:value2*#*key3:value3*, which indicates that the file uploaded to the bucket contains three groups of user-defined metadata: *key1:value1*, *key2:value2*, and *key3:value3*.

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Parameter	Optional or Mandatory	Description
ps	Optional (additional parameter)	The size of each part in a multipart upload task • The default value is the value of **defaultPartSize** in the configuration file. The parameter can be set to **auto**. In this case, obsutil automatically configures the part size for each multipart task based on the source file size. • Range: **100KB** to **5GB** • Unit: byte. This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes).
cpd	Optional (additional parameter)	The folder where the part records reside. The default value is **.obsutil_checkpoint**, the subfolder in the home directory of the user who executes obsutil commands. A part record is generated during a multipart upload and saved to the **upload** subfolder. After the upload succeeds, its part record is deleted automatically. If the upload fails or is suspended, the system attempts to resume the task according to its part record when you perform the upload the next time.
r	Mandatory for uploading a folder (additional parameter) Optional for uploading multiple files/ folders	Recursively uploads all files and subfolders within a folder.
f	Optional for uploading a folder or multiple files/ folders (additional parameter)	Runs in force mode.
j	Optional for uploading a folder or multiple files/ folders (additional parameter)	The maximum number of concurrent tasks for uploading a folder. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.

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Parameter	Optional or Mandatory	Description
msm	Mandatory for uploading multiple files/ folders (additional parameter)	Enables the mode for uploading multiple files/folders. Possible values are **1** and **2**. ● If **msm** is set to **1**, the source URL indicates a list of file/folder names separated by commas. ● If **msm** is set to **2**, the source URL indicates a file containing a list of file/folder names. ● If the file or folder name already contains commas (,), do not set **msm** to **1**. ● If parameter **r** is not set, the folders in the list will not be uploaded.
exclude	Optional for uploading a folder or multiple files/ folders (additional parameter)	The file matching patterns that are excluded. After this parameter is specified, if the name of the file to be uploaded matches the value of this parameter, the file is skipped. For example, if this parameter is set to ***.txt**, all files whose names end with **.txt** are skipped and not uploaded. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent ***** and **\?** to represent **?**. ● Multiple **exclude** parameters can be specified, for example, **-exclude=*.xxx -exclude=*.xxx**. **Restrictions**: The matching pattern takes effect only for files in the folder. **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute file path (including the file name and file directory).

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Parameter	Optional or Mandatory	Description
include	Optional for uploading a folder or multiple files/ folders (additional parameter)	The file matching patterns that are included. After this parameter is specified, if the name of the file to be uploaded matches the value of this parameter, the file is uploaded. For example, if this parameter is set to ***.txt**, all files whose names end with **.txt** are uploaded. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent * and **\?** to represent **?**. ● Multiple **include** parameters can be specified, for example, **-include=*.xxx -include=*.xxx**. **Restrictions**: ● The matching pattern takes effect only for files in the folder. ● If both the **exclude** and **include** parameters are configured, the **exclude** rules are applied first. If the name of a file to be uploaded does not match **exclude**, OBS checks whether the file name matches **include**. If yes, the file is uploaded. If no, the file is skipped. **Example:** `./obsutil cp /localpath/ obs://test/ -include=/localpath/2022-12-09/* -f -r` This command uploads files that are under **localpath** and start with **/localpath/2022-12-09/** to bucket **test**. **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute file path (including the file name and file directory).

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Parameter	Optional or Mandatory	Description
at	Optional for uploading a folder or multiple files/ folders (additional parameter)	Indicates that only the files whose latest access time is within the value of **timeRange** are uploaded. This parameter must be used together with **timeRange**.
disableDirObject	Optional for uploading multiple folders (additional parameter)	Indicates the folders themselves are not uploaded as an object. Configuring this parameter can avoid uploading empty folders to a bucket. If a folder contains files, the files will be uploaded and the original path format is retained.
timeRange	Optional for uploading a folder or multiple files/ folders (additional parameter)	The time range matching pattern when uploading files. Only files whose latest modification time is within the configured time range are uploaded. This pattern has a lower priority than the file matching patterns (**exclude**/**include**). That is, the time range matching pattern is executed after the configured file matching patterns. ● Time in the matching pattern is the UTC time. ● The matching time range is represented in *time1*-*time2*, where *time1* must be earlier than or the same as *time2*. The time format is *yyyyMMddHHmmss*. ● Automatic formatting is supported. For example, *yyyyMMdd* is equivalent to *yyyyMMdd***000000**, and *yyyyMM* is equivalent to *yyyyMM***01000000**. ● If this parameter is set to ***-***time2*, all files whose last modification time is earlier than *time2* are matched. If it is set to *time1*-*, all files whose last modification time is later than *time1* are matched.
mf	Optional (additional parameter)	Indicates that the name matching pattern (**include** or **exclude**) and the time matching pattern (**timeRange**) also take effect on folders.

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Parameter	Optional or Mandatory	Description
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (possibly success, failure, and warning files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. • A result file should be named as follows: **cp_{succeed | failed | warning}_report**_*time*_*TaskId*.**txt**. • By default, the maximum size of a single result file is 30 MB. You can set the maximum size by configuring **recordMaxLogSize** in the configuration file. • By default, the maximum number of result files that can be retained is 1,024. You can set the maximum number by configuring **recordBackups** in the configuration file. • If there are multiple folders and files and you need to confirm the details of a failed task, refer to the failure result file **cp_failed_report**_*time*_*TaskId*.**txt** in the result folder and the **log files** in the log path.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Response

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Field	Description
Parallel	The parameter **-p** in the request
Jobs	The parameter **-j** in the request
Threshold	The parameter **-threshold** in the request
PartSize	The parameter **-ps** in the request
Exclude	The parameter **-exclude** in the request
Include	The parameter **-include** in the request
TimeRange	The parameter **-timeRange** in the request
VerifyLength	The parameter **-vlength** in the request
VerifyMd5	The parameter **-vmd5** in the request
CheckpointDir	The parameter **-cpd** in the request
OutputDir	The parameter **-o** in the request
ArcDir	The parameter **-arcDir** in the request
Succeed count	The number of successful tasks
Failed count	The number of failed tasks
Skip count	The number of tasks that are skipped during incremental upload, download, or copy, and synchronous upload, download, or copy. **NOTE** Skipped tasks are recorded into successful tasks.
Warning count	The number of tasks that are executed successfully but contain warnings. **NOTE** • The task for which a warning is generated may be a failure or a success, which needs to be further determined according to the corresponding result list. • The number of tasks that generate warnings is independent of the number of successful or failed tasks. The total number of tasks is the number of successful tasks plus the number of failed tasks.
Succeed bytes	The number of bytes that are successfully uploaded or downloaded.
max cost	The maximum duration of all tasks, in ms
min cost	The minimum duration of all tasks, in ms
average cost	The average duration of all tasks, in ms
average tps	The average number of tasks completed per second
Task id	The unique ID of an operation, which is used to search for the result file generated for a batch task

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4.2.6 Appendable Upload

Scenarios

After a simple upload, browser-based upload, or multipart upload is complete, the uploaded object can be read but cannot be modified. If the object's content changes, you need to upload a new object with the same name to overwrite the original one.

There will be real-time streams when you upload logs, video surveillance data, live streaming data, and others. Using any of the foregoing uploads may cause problems such as complex software architecture, high server loads from frequent client requests, and high data latency. To solve such problems, you can use the appendable upload, which allows you to append data to the end of an object in a specific bucket. If there is no object with the same key value in the bucket, a new object will be created.

With appendable upload, newly generated video data can be appended to the same object in a timely manner. A client only needs to periodically obtain the length of the object and compare it with the length read last time. If there is new data that can be read, the client will read the newly uploaded data. In this way, the architecture can be simplified and its scalability can be enhanced.

Limits

- The last modification time of the object is updated each time an appendable upload is performed.
- If SSE-C encryption is used on the server side, you need to specify the request headers such as **x-obs-server-side-encryption** when you perform any appendable upload, which is the same as initiating a multipart upload.
- For the server-side encryption (SSE-KMS), you only need to specify the request header such as **x-obs-server-side-encryption** when the file is uploaded for the first time and there is no object with the same name in the bucket.
- The length of each appendable upload cannot exceed the upper limit (5 GB) of the object length.
- Each appendable object can be appended for up to 10,000 times.
- If the object storage class is **COLD** (Archive) or **DEEP_ARCHIVE** (Deep Archive), appendable upload API cannot be called.
- If cross-region replication is configured for a bucket, appendable upload API cannot be called.
- Appendable upload is not available for parallel file systems.
- If you perform the PUT operation on an existing appendable object, the appendable object is overwritten by the newly uploaded object and the object type changes to normal. If you perform the PUT operation on a normal object, an error occurs.
- An appendable object will be changed to a normal object after being copied. An appendable object cannot be copied and saved as an appendable object.

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Important Notes

- If the file you want to append data to does not exist, calling the AppendObject API will create an appendable file.
- If a bucket has WORM enabled, an append operation on this bucket will fail, with a 403 error returned.
- The ETag returns the hash value of the data to be uploaded, not the hash value of the entire object.
- Suppose there is a file you want to append data to:
  - If the file is appendable and the position where data will be appended matches the file length, the data can be directly appended to the end of the file. If the position does not match the file length, the PositionNotEqualToLength exception will be returned.
  - If the file is not appendable, for example, the file type is **Normal**, the ObjectNotAppendable exception will be returned.

Ways to Append

You can use SDKs or APIs to append objects.

Using APIs

Appending an Object

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP: not supported	Node.js

4.2.7 Authorizing a Third Party to Upload Objects

Scenarios

If a third-party user does not have the upload permission, you can grant temporary permissions to them for accessing OBS and uploading objects within a validity period. For example, some companies have user management systems that manage app users and local users. These users do not have IAM user permissions, so you can grant temporary permissions to allow these users to temporarily access OBS.

Use either of the following methods:

- Temporary security credentials
- A temporary URL

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Important Notes

Method	Description
Temporary security credentials	The validity period of temporary security credentials is from 15 minutes to 24 hours.
	When obtaining temporary security credentials, you can send the policy parameter to request for the least temporary permissions that can be granted to IAM users.
Temporary URL	Only the bucket owner can grant a temporary URL to others. If the owner changes the validity period of a URL, OBS obtains the authentication information again to generate a new URL.
	The **obs:PutObject** permission is required for uploading an object using a temporary URL.

Using Temporary Security Credentials to Grant Upload Permissions

You can assign temporary security credentials (including an AK, an SK, and a security token) to a third-party application or an IAM user, so that they can access OBS only for a specified period of time with defined permissions.

The temporary AK/SK and the security token comply with the least privilege principle. They must be used together to call an API for authentication and the **x-obs-security-token** field must be added to the request header.

For details, see **Accessing OBS Using Temporary Access Keys**.

Using a Temporary URL to Grant Upload Permissions

ObsClient allows you to create a URL with Query parameters that carry authentication information by specifying the security credentials, request method, and request parameters. You can share this URL with other users for them to make a temporary access. You need to specify the validity period of the temporary URL to restrict the allowed access duration.

Temporary URLs allow third-party users to upload objects without security credentials or authorization. OBS stores the objects uploaded by third-party users in a specified bucket.

For details, see **Accessing OBS Using a Temporary URL**.

4.2.8 Checking the Upload Progress

Scenarios

You can use OBS SDKs to obtain the upload progress of a specified object to estimate the remaining time.

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SDKs Available for Progress Check

You can use the SDKs listed below to check your upload progress.

Java	Python	C: not supported	Go: not supported	BrowserJS	.NET	Android	iOS: not supported	PHP: not supported	Node.js: not supported

4.3 Downloading an Object

Scenarios

You can download objects from OBS to your local computer.

OBS supports batch download of objects. For details, see **Does OBS Support Batch Download?**

Constraints

- Objects in the Archive or Deep Archive storage class can be downloaded only when they are in the **Restored** state.
- Batch download is not supported on **OBS Console**. To batch download files or folders, you can use OBS Browser+ or obsutil.
  - **Downloading Files or Folders Using OBS Browser+**
  - **Downloading Objects Using obsutil**

Ways to Download an Object

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to download objects.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Download the object.

- **To download a single object, do as follows**:

  Click **Download** in the **Operation** column of the object. The object is downloaded to the default path.

  Alternatively, click **More** > **Download As** in the **Operation** column of the object. In the **Download As** dialog box, right-click the object name with the download link and choose **Save link as...** to download the object to a specified path.

- **To download multiple objects in a batch, do as follows**:

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Select multiple objects and choose **More** > **Download** above the object list.

----End

Using APIs

Downloading an Object

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Go to the target bucket, select the file or folder you want to download, and click **Download**.

You can select multiple files or folders and batch download them.

NOTE

- To download Archive files, you must restore them first. For details, see **Restoring an Object**.
- Only files or folders that have been listed can be downloaded in batches. You can drag the scroll bar to the bottom to update the number of listed files or folders. 100 files or folders can be updated at a time.

Step 3 In the displayed dialog box, select a path for saving the file or folder and click **Select Folder**.

----End

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
  - Downloading a single object
    ```
    obsutil cp obs://bucket/key file_or_folder_url [-tempFileDir=xxx] [-dryRun] [-u] [-vlength] [-vmd5] [-p=1] [-threshold=52428800] [-versionId=xxx] [-ps=auto] [-cpd=xxx][-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Downloading objects in batches
    ```
    obsutil cp obs://bucket[/key] folder_url -r [-tempFileDir=xxx] [-dryRun] [-f] [-flat] [-u] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
- In Linux or macOS
  - Downloading a single object
    ```
    ./obsutil cp obs://bucket/key file_or_folder_url [-tempFileDir=xxx] [-dryRun] [-u] [-vlength] [-vmd5] [-p=1] [-threshold=52428800] [-versionId=xxx] [-ps=auto] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

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  - Downloading objects in batches

```
./obsutil cp obs://bucket[/key] folder_url -r [-tempFileDir=xxx] [-dryRun] [-f] [-flat] [-u] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

Examples

- Take the Windows OS as an example. Run the **obsutil cp obs://bucket-test/key d:\temp\test.txt** command to download a single object.

```
obsutil cp obs://bucket-test/key d:\temp\test.txt
Start at 2024-09-30 08:39:34.180766 +0000 UTC

Parallel:      5                 Jobs:          5
Threshold:     50.00MB           PartSize:      auto
VerifyLength:  false             VerifyMd5:     false
CheckpointDir: xxxx
TempFileDir: xxxx

[=========================================] 100.00% 4.86 KB/s 8.46MB/8.46MB 0s
Download successfully, 8.46MB, obs://bucket-test/key --> d:\temp\test.txtt, cost [41], status [200], request id [000001924215BEC84019EDF4044A5451]
```

- Take the Windows OS as an example. Run the **obsutil cp obs://bucket-test/temp d:\ -f -r** command to download objects in batches.

```
obsutil cp obs://bucket-test/temp d:\ -f -r
Start at 2024-09-30 08:41:56.0306522 +0000 UTC

Parallel:      5                 Jobs:          5
Threshold:     50.00MB           PartSize:      auto
VerifyLength:  false             VerifyMd5:     false
CheckpointDir: xxxx

Task id: 3066a4b0-4d21-4929-bb84-4829c32cbd0f
OutputDir: xxxx
TempFileDir: xxxx

[=====================================================] 100.00% tps:17.86 155.59 KB/s 7.20MB/7.20MB 0s
Succeed count:   6        Failed count:    0
Succeed bytes:   70B
Metrics [max cost:153 ms, min cost:129 ms, average cost:92.00 ms, average tps:70, transferred size: 7.20MB]

Task id: 3066a4b0-4d21-4929-bb84-4829c32cbd0f
```

- For more examples, see **Common Examples**.

Parameter Description

Parameter	Optional or Mandatory	Description
file_or_folder_url	Mandatory for downloading an object	The local file/folder path
folder_url	Mandatory for downloading objects in batches	The local folder path
bucket	Mandatory	The bucket name

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Parameter	Optional or Mandatory	Description
key	Mandatory for downloading an object Optional for downloading objects in a batch	The name of the object to be downloaded, or the name prefix of the objects to be downloaded in batches This parameter cannot be left blank when downloading an object. The saving and naming rules are as follows: • If this parameter specifies a file or folder path that does not exist, the tool checks whether the value ends with a slash (/) or backslash (\). If yes, a folder is created based on the path, and the object is downloaded to this newly created directory. • If this parameter specifies a file or folder path that does not exist and the value does not end with a slash (/) or backslash (\), the object is downloaded to your local PC with the value of **key** as the file name. • If this parameter specifies an existing file, the object is downloaded to your local PC overwriting the existing file, with the value of **key** as the file name. • If this parameter specifies an existing folder, the object is downloaded to the directory specified by **file_or_folder_url** with the object name as the file name. During batch download, the saving rules are as follows: • If this parameter is left blank, all objects in the bucket are downloaded to the directory specified by **folder_url**. • If this parameter is configured, objects whose name prefix is the configured value in the bucket are downloaded to the directory specified by **folder_url**. **NOTE** • If this parameter is configured but the **flat** parameter is not configured when downloading objects in a batch, the name of the downloaded file contains the name prefix of the parent object. If **flat** is configured, then the name of the downloaded file does not contain the name prefix of the parent object. • For details about how to use this parameter, see **Download**.

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Parameter	Optional or Mandatory	Description
fr	Optional for downloading an object (additional parameter)	Generates an operation result file when downloading an object.
flat	Optional for downloading objects in batches (additional parameter)	The name prefix of the parent object is excluded when downloading objects in batches.
tempFileDir	Optional (additional parameter)	The directory for storing temporary files during multipart download. The default value is the value of **defaultTempFileDir** in the configuration file. **NOTE** • If this parameter is left blank and the **defaultTempFileDir** parameter in the configuration file is also left blank, temporary files generated during multipart download are saved in the directory where to-be-downloaded files are located and end with the suffix of **.obs.temp**. • Temporary files generated during multipart download are stored in this directory. Therefore, ensure that the user who executes obsutil has the write permission on the path. • The available space of the partition where the path is located must be greater than the size of the objects to be downloaded.
dryRun	Optional (additional parameter)	Conducts a dry run.
u	Optional (additional parameter)	Indicates incremental download. If this parameter is set, each object can be downloaded only when it does not exist in the local path, its size is different from the namesake one in the local path, or it has the latest modification time.
vlength	Optional (additional parameter)	Checks whether the sizes of the local files are the same as those of the objects in the bucket after the download is complete.

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Parameter	Optional or Mandatory	Description
vmd5	Optional (additional parameter)	Checks whether MD5 values of the local files are the same as those of the objects in the bucket after the download is complete. **NOTE** Objects in the bucket must contain metadata **x-obs-meta-md5chksum**, or MD5 verification will be skipped. **CAUTION** If your object needs encryption, do not use this parameter.
p	Optional (additional parameter)	The maximum number of concurrent multipart download tasks when downloading an object. The default value is the value of **defaultParallels** in the configuration file.
threshold	Optional (additional parameter)	Indicates the threshold for enabling multipart download, in bytes. The default value is the value of **defaultBigfileThreshold** in the configuration file. **NOTE** • If the size of the object to be downloaded is smaller than the threshold, download the object directly. If not, a multipart download is required. • If you download an object directly, no part record is generated, and resumable transmission is not supported. • This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes).
versionId	Optional for downloading an object (additional parameter)	The source object version ID that can be specified when downloading an object
ps	Optional (additional parameter)	The size of each part in a multipart download task, in bytes. The default value is the value of **defaultPartSize** in the configuration file. **NOTE** • This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes). • The parameter can be set to **auto**. In this case, obsutil automatically sets the part size for each multipart task based on the source object size.

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Parameter	Optional or Mandatory	Description
fs	Optional (additional parameter)	Whether the method of listing parallel file systems is applied. If you are listing parallel file systems, you are recommended to add this parameter. **CAUTION** • With this method, the listing time required varies largely depending on the directory structures. • After this parameter is enabled, **marker** and **limit** will be ignored. Then, the size of the bucket, parallel file system, or directory will be calculated. • This parameter is only supported by obsutil 5.5.12 and later.
cpd	Optional (additional parameter)	The folder where the part records reside. The default value is **.obsutil_checkpoint**, the subfolder in the home directory of the user who executes obsutil commands. **NOTE** A part record is generated during a multipart download and saved to the **down** subfolder. After the download succeeds, its part record is deleted automatically. If the download fails or is suspended, the system attempts to resume the task according to its part record when you perform the download the next time.
r	Mandatory for downloading objects in batches (additional parameter)	Copies objects in batches based on a specified object name prefix.
f	Optional for downloading objects in batches (additional parameter)	Runs in force mode.
j	Optional for downloading objects in batches (additional parameter)	The maximum number of concurrent tasks for downloading objects in a batch. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.

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Parameter	Optional or Mandatory	Description
exclude	Optional for downloading objects in batches (additional parameter)	The matching patterns of source objects that are excluded, for example, ***.txt** **NOTE** • The asterisk (*) represents any group of characters, and the question mark (?) represents any single character. For instance, **abc*.txt** indicates any file whose name starts with **abc** and ends with **.txt**. • You can use ***** to represent ***** and **\?** to represent **?**. • If the name of the object to be downloaded matches the value of this parameter, the object is skipped. **NOTICE** • You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. • The matching pattern applies to the absolute path of an object, including the object name prefix and object name starting from the root directory. For example, if the path of an object in the bucket is **obs://bucket/src1/src2/test.txt**, then the absolute path of the object is **src1/src2/test.txt**. • This matching pattern applies only to objects whose names do not end with a slash (/). • Multiple **exclude** parameters can be specified, for example, **-exclude=*.xxx -exclude=*.xxx**.

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Parameter	Optional or Mandatory	Description
include	Optional for downloading objects in batches (additional parameter)	Specifies what formats of objects can be downloaded. If this parameter is set to ***.jpg**, only objects in the **.jpg** format can be downloaded. **NOTE** • The asterisk (*) represents any group of characters, and the question mark (?) represents any single character. • You can use ***** to represent ***** and **\?** to represent **?**. • Only after identifying that the name of the file to be downloaded does not match the value of **exclude**, the system checks whether the file name matches the value of this parameter. If yes, the file is downloaded. If not, the file is skipped. **NOTICE** • You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. • The matching pattern applies to the absolute path of an object, including the object name prefix and object name starting from the root directory. For example, if the path of an object in the bucket is **obs://bucket/src1/src2/test.txt**, then the absolute path of the object is **src1/src2/test.txt**. • This matching pattern applies only to objects whose names do not end with a slash (/). • Multiple **include** parameters can be specified, for example, **-include=*.xxx -include=*.xxx**.

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Parameter	Optional or Mandatory	Description
timeRange	Optional for downloading objects in batches (additional parameter)	The time range matching pattern when downloading objects. Only objects whose latest modification time is within the configured time range are downloaded. This pattern has a lower priority than the object matching patterns (**exclude**/**include**). That is, the time range matching pattern is executed after the configured object matching patterns. **NOTE** • The matching time range is represented in *time1*-*time2*, where *time1* must be earlier than or the same as *time2*. The time format is *yyyyMMddHHmmss*. • Automatic formatting is supported. For example, yyyyMMdd is equivalent to yyyyMMdd000000, and yyyyMM is equivalent to yyyyMM01000000. • If this parameter is set to ***-***time2***, all files whose latest modification time is earlier than *time2* are matched. If it is set to *time1*-***, all files whose latest modification time is later than *time1* are matched. **NOTICE** • Time in the matching pattern is the UTC time. • This matching pattern applies only to objects whose names do not end with a slash (/).
mf	Optional (additional parameter)	Indicates that the name matching pattern (**include** or **exclude**) and the time matching pattern (**timeRange**) also take effect on objects whose names end with a slash (/).

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Parameter	Optional or Mandatory	Description
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (possibly success, failure, and warning files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. **NOTE** • A result file should be named as follows: **cp_{succeed | failed | warning}_report**_*time*_*TaskId*.**txt**. • By default, the maximum size of a single result file is 30 MB and the maximum number of result files that can be retained is 1,024. You can set the maximum size and number by configuring **recordMaxLogSize** and **recordBackups** in the configuration file. • If there are multiple folders and files and you need to confirm the details of a failed task, refer to the failure result file **cp_failed_report**_*time*_*TaskId*.**txt** in the result folder and the **log files** in the log path.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Response

Field	Description
Parallel	The parameter **-p** in the request

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Field	Description
Jobs	The parameter **-j** in the request
Threshold	The parameter **-threshold** in the request
PartSize	The parameter **-ps** in the request
Exclude	The parameter **-exclude** in the request
Include	The parameter **-include** in the request
TimeRange	The parameter **-timeRange** in the request
VerifyLength	The parameter **-vlength** in the request
VerifyMd5	The parameter **-vmd5** in the request
CheckpointDir	The parameter **-cpd** in the request
OutputDir	The parameter **-o** in the request
ArcDir	The parameter **-arcDir** in the request
Succeed count	The number of successful tasks
Failed count	The number of failed tasks
Skip count	The number of tasks that are skipped during incremental upload, download, or copy, and synchronous upload, download, or copy. **NOTE** Skipped tasks are recorded into successful tasks.
Warning count	The number of tasks that are executed successfully but contain warnings. **NOTE** • The task for which a warning is generated may be a failure or a success, which needs to be further determined according to the corresponding result list. • The number of tasks that generate warnings is independent of the number of successful or failed tasks. The total number of tasks is the number of successful tasks plus the number of failed tasks.
Succeed bytes	The number of bytes that are successfully uploaded or downloaded.
max cost	The maximum duration of all tasks, in ms
min cost	The minimum duration of all tasks, in ms
average cost	The average duration of all tasks, in ms
average tps	The average number of tasks completed per second
Task id	The unique ID of an operation, which is used to search for the result file generated for a batch task

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4.4 Limiting Download Speed By Single-Connection Bandwidth Throttling

Scenarios

To prevent a client from using a large amount of bandwidth to download objects, you can use single-connection bandwidth throttling to limit the download speed, allowing other applications to have enough bandwidth.

You can limit the speed by:

- **SDK**
- **Object URL**
- **Signed URL**
- **Header Field**

SDK

When you use an SDK to send a request, you can only limit the download speed by single-connection bandwidth throttling. For details, see **Single-Connection Bandwidth Throttling**.

Object URL

Item	Description
Object	Public read or public read/write object
Method	Add the bandwidth limit parameter in the **x-obs-traffic-limit=***value* format to the end of the URL of the shared object. The value can be from **819200** to **838860800**, in bit/s.
Scenarios	Downloading objects
Example	https://bucketname.obs.cn-north-4.myhuaweicloud.com/object1?**x-obs-traffic-limit=819200** indicates that the maximum download speed of **object1** is 100 KB/s.

Signed URL

Item	Description
Object	Private object
Method	When you use an SDK to generate a signed URL, add the bandwidth limit parameter in the **x-obs-traffic-limit=***value* format to the signature for calculation. The value can be from **819200** to **838860800**, in bit/s.

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Item	Description
Scenarios	Downloading objects
Example	https://bucketname.obs.cn-north-4.myhuaweicloud.com/object1?**x-obs-traffic-limit=819200&Signature=signature**

Header Field

Item	Description
Object	Private object
Method	Add the bandwidth limit parameter in the **x-obs-traffic-limit:***value* format to the header field. The value can be from **819200** to **838860800**, in bit/s.
Scenarios	Downloading objects
Example	GET /object01 HTTP/1.1 User-Agent: curl/7.29.0 Host: examplebucket.obs.*region*.myhuaweicloud.com Accept: */* Date: WED, 01 Jul 2015 04:24:33 GMT Authorization: OBS H4IPJX0TQTHTHEBQQCEC:NxtSMS0jaVxlLnxlO9awaMTn47s= **x-obs-traffic-limit:819200**

4.5 Previewing Objects

Scenarios

For security and compliance purposes, OBS prohibits the preview of objects in a bucket by using the default OBS domain name (**a bucket domain name or static website domain name**). When you use such a domain name to access objects (such as videos, images, and web pages) in a browser, no content will be displayed. Instead, the content is downloaded as an attachment.

To preview objects, you can use a user-defined domain name.

Solution 1: Use a User-Defined Domain Name

Solution 2: Use a User-Defined Domain Name and CDN

Solution 3: Use Private Bucket Retrieval on CDN

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NOTE

If you have bound a user-defined domain name to a bucket and enabled CDN acceleration, but the objects are still directly downloaded without object preview, handle the problem by referring to **With CDN Acceleration Enabled, Why Are the Objects in My OBS Bucket Directly Downloaded When I Access Them?**

This restriction takes effect in different regions at the following two points in time:

January 1, 2022: CN North-Beijing1, CN North-Beijing4, CN East-Shanghai1, CN East-Shanghai2, and CN South-Guangzhou

March 25, 2022: CN-Hong Kong, AP-Bangkok, AP-Singapore, AF-Johannesburg, LA-Mexico City1, LA-Mexico City2, LA-Sao Paulo1, LA-Santiago, AP-Jakarta, and ME-Riyadh

Solution 1: Use a User-Defined Domain Name

NOTE

Solution advantages and restrictions

- The bucket policy must be public read, so that all objects in the bucket can be accessed by anonymous users.
- As required by the China's Ministry of Industry and Information Technology (MIIT), you must complete the Internet Content Provider (ICP) filing, if the bucket to which your user-defined domain name is bound is in any of the following regions:

  CN North-Beijing1, CN North-Beijing4, CN East-Shanghai1, CN East-Shanghai2, and CN South-Guangzhou

Procedure

Step 1 Bind a user-defined domain name to the OBS bucket.

For details, see **Configuring a User-Defined Domain Name**. During the configuration, add a CNAME record for the OBS bucket domain name.

Step 2 Check whether objects can be previewed in a browser online.

Share an object link formatted in **http://***User-defined domain name***/***Object access path* with other users for them to preview the object.

If the object still cannot be previewed, check whether the value of the object metadata **ContentType** is supported by the browser.

For example, **ContentType** should be set to **video/mp4** for an MP4 video or set to **image/jpeg** for a JPG image. For details about all supported **ContentType** values, see **Object Metadata Content-Type**.

You can configure **ContentType** using **OBS Console**, APIs, or SDKs.

Table 4-3 Modifying object metadata

Tool	Reference
OBS Console	**Configuring and Viewing Object Metadata**
APIs	**Modifying Object Metadata**
SDKs	Section about setting object attributes in the **SDK Reference**

----End

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Solution 2: Use a User-Defined Domain Name and CDN

NOTE

Solution advantages and restrictions

- The bucket policy must be public read, so that all objects in the bucket can be accessed by anonymous users.
- As required by the China's Ministry of Industry and Information Technology (MIIT), you must complete the Internet Content Provider (ICP) filing, if the bucket to which your user-defined domain name is bound is in any of the following regions:

  CN North-Beijing1, CN North-Beijing4, CN East-Shanghai1, CN East-Shanghai2, and CN South-Guangzhou
- HTTPS requests are supported. To use HTTPS, you need to import a certificate to CDN. For details, see **HTTPS Certificates**.

Procedure

Step 1 On the **CDN console**, add the prepared user-defined domain name as an acceleration domain name.

For details, see **Adding a Domain Name**. Set **Origin Server Address** to **Domain name** and set **Domain name** to an OBS bucket domain name, with the HTTP port and HTTPS port set to **80** and **443** respectively. On the **Advanced Settings** tab, click **Edit** next to **HTTP Header**. Then, add response header **Content-Disposition** and set its value to **inline**.

Step 2 Bind the user-defined domain name to the OBS bucket.

For details, see **Binding a User-Defined Domain Name**. During the configuration, use the CNAME record set allocated by CDN.

Step 3 Check whether objects can be previewed in a browser online.

Share an object link formatted in **http://***User-defined domain name***/***Object access path* with other users for them to preview the object.

If the object still cannot be previewed, check whether its metadata **ContentType** is supported by the browser.

For example, **ContentType** should be set to **video/mp4** for an MP4 video or set to **image/jpeg** for a JPG image. For details about all supported **ContentType** values, see **Object Metadata Content-Type**.

You can configure **ContentType** using **OBS Console**, APIs, or SDKs.

Step 4 (Optional) If the preview still fails, resolve the issue by referring to **Method 1** under **Solutions** and try again.

----End

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Solution 3: Use Private Bucket Retrieval on CDN

NOTE

Solution advantages and restrictions

- The bucket policy can be public read or private.
- You only need to configure an acceleration domain name on CDN. No user-defined domain name of OBS is required. As required by the China's Ministry of Industry and Information Technology (MIIT), the used acceleration domain name must complete the Internet Content Provider (ICP) filing, if your bucket is in any of the following regions:

  CN North-Beijing1, CN North-Beijing4, CN East-Shanghai1, CN East-Shanghai2, and CN South-Guangzhou
- HTTPS requests are supported. To use HTTPS, you need to import a certificate to CDN. For details, see **HTTPS Certificates**.

Procedure

Step 1 On the **CDN console**, add your domain name as an acceleration domain name and set the private OBS bucket as the origin server.

For details, see **Adding a Domain Name**. Set **Type** to **OBS bucket** and **Address** to the OBS bucket domain name. On the **Advanced Settings** tab of the domain name's details page, click **Edit** next to **HTTP Headers**. Then, add response header **Content-Disposition** and set its value to **inline**.

Step 2 Configure the CNAME record set on DNS.

For details, see the CNAME record configuration in **Accessing a Bucket Using a User-Defined Domain Name**. Use the CNAME record set allocated by CDN.

Step 3 Check whether objects can be previewed in a browser online.

Share an object link formatted in **http://***User-defined domain name***/***Object access path* with other users for them to preview the object.

If the object still cannot be previewed, check whether its metadata **ContentType** is supported by the browser.

For example, **ContentType** should be set to **video/mp4** for an MP4 video or set to **image/jpeg** for a JPG image. For details about all supported **ContentType** values, see **Object Metadata Content-Type**.

You can configure **ContentType** using **OBS Console**, APIs, or SDKs.

----End

4.6 Object Management

4.6.1 Listing Objects

On **OBS Console**, objects are displayed by name by default when you open a bucket's object list page. You can also sort objects by size or last modification time.

If your bucket has versioning enabled, on the **Objects** page, you can choose whether to display historical versions of objects.

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Constraints

- Listing objects by specifying a page number is not allowed.
- Objects cannot be listed by time when they were uploaded. You can search for objects by prefix.
- The size and last modification time in the object list sort only objects on the current page.

Ways to List Objects

You can use OBS Console, APIs, SDKs, or obsutil to list objects.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 View the listed objects. All objects in the bucket will be listed on different pages, with each page displaying 50 objects by default.

Step 4 (Optional) If versioning is enabled for a bucket, you can enable or disable **Historical Versions** above the object list to determine whether to display historical versions of objects.

- **Enabled**: Current and historical versions of objects (including deleted objects) are displayed.
- **Disabled**: Only current versions of objects are displayed.

----End

Using APIs

Listing Objects in a Bucket

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
```
obsutil ls obs://bucket[/prefix] [-s] [-d][-fs] [-v] [-du] [-marker=xxx] [-versionIdMarker=xxx] [-bf=xxx] [-limit=1] [-format=default] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```
- In Linux or macOS
```
./obsutil ls obs://bucket[/prefix] [-s][-fs] [-d] [-v] [-du] [-marker=xxx] [-versionIdMarker=xxx] [-bf=xxx] [-limit=1] [-format=default] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

Examples

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- Example 1: Take the Windows OS as an example. Run the **obsutil ls obs://bucket-test -limit=10** command to list objects in the bucket.

```
obsutil ls obs://bucket-test -limit=10
Start at 2024-09-30 08:18:50.0592788 +0000 UTC

Listing objects .

Folder list:
obs://bucket-test/api/

Object list:
key                                         LastModified              Size      StorageClass       ETag
obs://bucket-test/AUTHORS                   2018-11-16T02:15:49Z      33243     standard
"796393c1eaf502ef56a85c2ceb640aea"

obs://bucket-test/CONTRIBUTING.md           2018-11-16T02:15:49Z      1366
standard          "12d93325ba6131f852daecd18dd65edc"

obs://bucket-test/CONTRIBUTORS              2018-11-16T02:15:49Z      45710
standard          "b486b5003e6215c9199e86ab3ccec9fa"

obs://bucket-test/LICENSE                   2018-11-16T02:15:49Z      1479      standard
"5d4950ecb7b26d2c5e4e7b4e0dd74707"

obs://bucket-test/PATENTS                   2018-11-16T02:15:49Z      1303      standard
"3a55d95595a6f9e37dee53826b4daff2"

obs://bucket-test/README.md                 2018-11-16T02:15:49Z      1399      standard
"97351fd7946b9ea021a31a86ba2a10ab"

obs://bucket-test/VERSION                   2018-11-16T02:15:49Z      7         standard
"43d93b553855b0e1fc67e31c28c07b65"

obs://bucket-test/api/README                2018-11-16T02:15:49Z      521       standard
"4e9e63a87075df60cdf65c8ce9e92117"

obs://bucket-test/api/except.txt            2018-11-16T02:15:49Z      20194     standard
"8eb96de3f60447e2f09a7531c99fb3ee"

Next marker: api/except.txt
Folder number: 1
File number: 9
```

- Example 2: Take the Windows OS as an example. Run the **obsutil ls obs://bucket-test2** command to list objects in the bucket.

```
obsutil ls obs://bucket-test2
Start at 2024-09-30 08:21:06.6300221 +0000 UTC

Listing objects .

Object list:
key                                         LastModified              Size      StorageClass       ETag
obs://bucket-test2/123                      2022-03-29T09:17:51Z      0B        standard
"d41d8cd98f00b204e9800998ecf8427e"

obs://bucket-test2/1_2-3.txt                2022-03-29T09:17:51Z      0B        standard
"d41d8cd98f00b204e9800998ecf8427e"

obs://bucket-test2/1_2-3_33.txt             2022-03-29T09:17:51Z      200B      standard
"dcf204c11d791255adc63e61763c2426"

obs://bucket-test2/New text file.txt
                                            2022-03-29T09:17:51Z      0B        standard
"d41d8cd98f00b204e9800998ecf8427e"

Total size of bucket: 200B
Folder number: 0
File number: 4
```

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- Example 3: Take the Windows OS as an example. Run the **obsutil ls obs://bucket-test2/prefix** command to list objects whose name prefix is **prefix** in the bucket.

```
obsutil ls obs://bucket-test2/prefix
Start at 2024-09-30 08:24:36.7057148 +0000 UTC

Listing objects .

Object list:
key                                 LastModified              Size      StorageClass      ETag
obs://bucket-test2/prefix           2022-03-29T09:17:51Z      0B        standard
"d41d8cd98f00b204e9800998ecf8427e"

obs://bucket-test2/prefix2          2022-03-29T09:17:51Z      0B        standard
"d41d8cd98f00b204e9800998ecf8427e"

Total size of prefix [prefix]:: 0B
Folder number: 0
File number: 2
```

- For more examples, see **Common Examples**.

Parameter Description

Parameter	Optional or Mandatory	Description
bucket	Mandatory	The bucket name
prefix	Optional	The prefix of the object name for listing objects **NOTE** If this parameter is left blank, all objects in the bucket are listed.
s	Optional (additional parameter)	Displays simplified query result. **NOTE** In the simplified format, the returned result contains only the object name.
d	Optional (additional parameter)	Lists only objects and subdirectories in the current directory, instead of recursively listing all objects and subdirectories. In big data scenarios, parallel file systems usually have deep directory levels and each directory has a large number of files. In such case, you are advised to use this parameter to limit the scope to list. **NOTE** According to the naming conventions in OBS, a slash (/) is used as the directory separator.
v	Optional (additional parameter)	Lists versions of an object in a bucket. The result contains the latest version and historical versions (if any) of the object.

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Parameter	Optional or Mandatory	Description
marker	Optional (additional parameter)	The start position for listing objects in a bucket. The objects following this start position are sorted in lexicographical order by object name. **NOTE** For details about how to use this parameter, see **Listing**.
versionIdMarker	Optional (additional parameter). It must be used together with the **v** and **marker** parameters.	The start position for listing object versions in a bucket. The object versions following this start position are sorted in lexicographical order by object name. **NOTE** If the value of **versionIdMarker** is not a version ID specified by **marker**, **versionIdMarker** is invalid.
bf	Optional (additional parameter)	The display formats of bytes in the listing result. Possible values are: • human-readable • raw **NOTE** If this parameter is not configured, the display format of bytes in the result is determined by the **humanReadableFormat** parameter in the configuration file.
du	Optional (additional parameter)	Quickly returns the total size of listed objects, without displaying detailed object information. This parameter can be used together with other parameters. **NOTE** If there are too many objects listed, wait for a while. **CAUTION** • This parameter is only supported by obsutil 5.4.6 and later.

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Parameter	Optional or Mandatory	Description
fs	Optional (additional parameter)	Whether the method of listing parallel file systems is applied. If you are listing parallel file systems, you are recommended to add this parameter. **CAUTION** • With this method, the listing time required varies largely depending on the directory structures. • After this parameter is enabled, **marker** and **limit** will be ignored. Then, the size of the bucket, parallel file system, or directory will be calculated. • This parameter is only supported by obsutil 5.5.12 and later.
limit	Optional (additional parameter)	The maximum number of objects that can be listed. If the value is less than or equal to 0, all objects are listed. If it is left blank, 1,000 objects are listed by default. **NOTE** If there are a large number of objects in a bucket, you are advised to set this parameter to limit the number of objects to be listed each time. If not all objects are listed, **marker** and **versionIdMarker** of the next request will be returned in the result, which you can use to list the remaining objects.
format	Optional (additional parameter)	Prints a listing result in the user-defined format. Currently, the value can only be **default**, indicating that the listing result is displayed in one row.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

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Response

Field	Description
Key	The object name
LastModified	The time when the last modification was made to the object
Size	The object size
StorageClass	The storage class of an object. Possible values are: • **standard**: Standard storage class. It features low access latency and high throughput, and is applicable to storing frequently accessed data (multiple accesses per month) or data that is smaller than 1 MB. • **warm**: Infrequent Access storage class. It is ideal for storing infrequently accessed (less than 12 times a year) data, but when needed, the access has to be fast. • **cold**: Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once a year) data. • **deep-archive**: Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely (once every few years) accessed. This storage class costs less than the Archive storage class, but takes longer time (usually several hours) to restore data.
ETag	The ETag of an object, which is a Base64-encoded 128-bit MD5 digest. ETag is the unique identifier of the object content. It can be used to determine whether the object content is changed. For example, if the ETag value is **A** when an object is uploaded, but this value has changed to **B** when the object is downloaded, it indicates that the object content has been changed. The ETag reflects changes to the object content, rather than the object metadata. An uploaded object or copied object has a unique ETag.

4.6.2 Copying Objects

Scenarios

You can copy objects in OBS. An object of up to 5 GB can be copied by each operation. To copy an object larger than 5 GB, use the multipart upload API. Specifically, this copy operation allows you to:

- Create a copy for an object.
- Rename an object by creating a copy for it and deleting the source object.
- Edit object metadata.

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NOTE

Each object has metadata, which is a set of name-value pairs. There is system-defined metadata and user-defined metadata. Some system-defined metadata can also be controlled by users. When you upload an object, you can set its metadata.

- After you upload the object, you can modify its metadata using an API. For details, see **Modifying Object Metadata**.
- You can also create an object copy and set the metadata. In the copy operation, set the target object to be the same as the source object.

Both user-controlled metadata and user-defined metadata are copied. OBS automatically resets the system-controlled metadata. In the copy request, you do not need to set such metadata. For example, when you copy an object, OBS resets the creation date of the copied object.

If you want to modify metadata, even only one piece of metadata, that can be configured by users (defined by users or the system), specify all the metadata that can be configured by users on the source object in the request.

Prerequisites

- You have the read permission for the source object and the read and write permissions for the destination bucket.
- You have both the **obs:object:GetObject** and **obs:object:PutObject** permissions.

Important Notes

- Objects cannot be copied across regions. For example, objects in a bucket in the CN North-Beijing1 region cannot be copied to a bucket in the CN North-Beijing4 region. To automatically copy objects across regions, see **Cross-Region Replication**.
- An appendable object cannot be copied.
- You can copy an object of up to 5 GB in a single operation. To copy an object larger than 5 GB, use the multipart upload API.
- If you want to copy a large number of Deep Archive objects, you can set the storage class of object copies to Standard and then transition them to the Deep Archive storage class through **lifecycle rules** to lower the costs on PUT requests.
- By default, an original object will be overwritten by its copy with the same name. After the copy is successful, only the new object can be downloaded. The original object will be deleted. To prevent data loss:
  - Before copying an object, ensure that there is no object with the same name as the object copy or the object with the same name is useless.
  - Enable versioning.

    If versioning is enabled, deleted or overwritten objects will be retained as historical versions. You can restore a historical version at any time.
- OBS allows you to copy your service data stored in OBS to a specified region, but Huawei Cloud does not detect the stored data. You need to ensure the legal compliance of your use of OBS on your own. If cross-border transfer is required, ensure that your use complies with relevant laws and regulations.
- You cannot determine whether a copy request is executed successfully only using **status_code** in the HTTP header. If 200 in **status_code** is returned, the

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server has received the request and starts to process the request. The body in the response shows whether the request is executed successfully. The request is executed successfully only when the body contains ETag; otherwise, the request fails to be executed.

Ways to Copy Objects

You can use APIs, SDKs, OBS Browser+, or obsutil to copy objects.

Using APIs

Copying Objects

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the GUI Tool - OBS Browser+

Constraints

- Files or folders in external buckets cannot be copied.
- The restore status of Archive objects cannot be copied.
- The source path and target path must be different.

Procedure

Step 1 Log in to OBS Browser+.

Step 2 Go to the target bucket. Right-click the file or folder and choose **Copy** from the shortcut menu.

Step 3 Right-click the path for saving the file or folder and choose **Paste** from the shortcut menu.

----End

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
  - Copying a single object
    ```
    obsutil cp obs://srcbucket/key obs://dstbucket/[dest] [-dryRun][-u] [-crr] [-vlength] [-vmd5] [-p=1] [-threshold=52428800] [-versionId=xxx] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Copying objects in batches
    ```
    obsutil cp obs://srcbucket[/key] obs://dstbucket[/dest] -r [-dryRun][-f] [-flat] [-u] [-crr] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

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- In Linux or macOS
  - Copying a single object
    ```
    ./obsutil cp obs://srcbucket/key obs://dstbucket/[dest] [-dryRun] [-u] [-crr] [-vlength] [-vmd5] [-p=1] [-threshold=52428800] [-versionId=xxx] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Copying objects in batches
    ```
    ./obsutil cp obs://srcbucket[/key] obs://dstbucket[/dest] -r [-dryRun] [-f] [-flat] [-u] [-crr] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

Examples

- Take the Windows OS as an example. Run the **obsutil cp obs://bucket-test/key obs://bucket-test2** command to copy a single object.
  ```
  obsutil cp obs://bucket-test/key obs://bucket-test2
  Start at 2024-09-30 08:30:09.0815415 +0000 UTC

  Parallel:      3                Jobs:          3
  Threshold:     50.00MB          PartSize:      auto
  CheckpointDir: xxxx

  [=================================================] 100.00% 6/s 0s
  Waiting for the copied key to be completed on server side.
  Copy successfully, 19B, obs://bucket-test/key --> obs://bucket-test2/key
  ext.txt, cost [1708], status [200], request id [00000192420D227E4017336A12F1DC22]
  ```
- Take the Windows OS as an example. Run the **obsutil cp obs://bucket-test/temp/ obs://bucket-test2 -f -r** command to copy objects in batches.
  ```
  obsutil cp obs://bucket-test/temp/ obs://bucket-test2 -r -f
  Start at 2024-09-30 08:34:02.7819703 +0000 UTC

  Parallel:      5                Jobs:          5
  Threshold:     50.00MB          PartSize:      auto
  CheckpointDir: xxxx

  Task id: 0476929d-9d23-4dc5-b2f8-0a0493f027c5
  OutputDir: xxxx

  [=========================================================] 100.00% 10/s 0s
  Succeed count:   5        Failed count:    0
  Metrics [max cost:298 ms, min cost:192 ms, average cost:238.00 ms, average tps:9.71, transferred size: 7.20MB]
  Task id: 0476929d-9d23-4dc5-b2f8-0a0493f027c5
  ```
- For more examples, see **Common Examples**.

Parameter Description

Parameter	Optional or Mandatory	Description
srcbucket	Mandatory	The source bucket name
dstbucket	Mandatory	The destination bucket name
dest	Optional	The destination object name when copying an object, or the name prefix of destination objects when copying objects in batches

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Parameter	Optional or Mandatory	Description
key	Mandatory for copying an object. Optional for copying objects in batches.	The source object name when copying an object, or the name prefix of source objects when copying objects in batches The rules are as follows: • This parameter cannot be left blank when copying an object. – If **dest** is left blank, the source object is copied to the root directory of the destination bucket. – If the value of **dest** ends with a slash (/), the destination object name is the value of **dest** plus the source object name. Otherwise, the destination object name is the value of **dest**. • If this parameter is left blank when copying objects in batches, all objects in the source bucket are copied. If not, objects whose name prefix is the set value in the source bucket are copied. The rules for confirming the name of the destination object are as follows: – If the value of **dest** ends with a slash (/), the destination object name is the value of **dest** plus the source object name. – If the value of **dest** does not end with a slash (/), the destination object name is *the value of **dest**/source object name*. • If this parameter is configured but the **flat** parameter is not when copying objects in batches, the name of the source object contains the name prefix of the parent object. If **flat** is configured, then the name of the source object does not contain the name prefix of the parent object. **NOTE** For details about how to use this parameter, see **Copy**.
fr	Optional for copying an object (additional parameter)	Generates an operation result file when copying an object.

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Parameter	Optional or Mandatory	Description
flat	Optional for copying objects in batches (additional parameter)	The name prefix of the parent object is excluded when copying objects in batches.
dryRun	Optional (additional parameter)	Conducts a dry run.
crr	Optional (additional parameter)	Enables the client-side cross-region replication function. In this mode, data is directly copied to the destination bucket from the source bucket through data stream. The buckets can be any two OBS buckets. • If this parameter is configured, the configuration of client-side cross-region replication must be updated in the configuration file. For details, see **Updating a Configuration File**. • When cross-region replication is enabled, the upload/download bandwidth, CPU, and memory resources of the host where commands are executed will be occupied, which may deteriorate the host performance. **NOTE** The configurations of the source bucket and destination bucket are respectively **akCrr/skCrr/tokenCrr/endpointCrr** and **ak/sk/token/endpoint** in the configuration file.
vlength	Optional (additional parameter)	Verifies whether the object size in the destination bucket is the same as that in the source bucket after the copy task completes. **This parameter must be used together with crr.**

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Parameter	Optional or Mandatory	Description
vmd5	Optional (additional parameter)	Verifies whether the MD5 value of the destination bucket is the same as that of the source bucket after the copy task completes. • **This parameter must be used together with crr.** • **Objects in the source bucket must contain metadata x-obs-meta-md5chksum, or MD5 verification will be skipped.** After the MD5 verification is successful, this parameter value is used for metadata **x-obs-meta-md5chksum** of the destination object, for later MD5 verification during download or replication. • **If your object needs encryption, do not use this parameter.**
u	Optional (additional parameter)	Indicates incremental copy. If this parameter is set, each object can be copied only when it does not exist in the destination bucket, its size is different from the namesake one in the destination bucket, or it has the latest modification time.
p	Optional (additional parameter)	The maximum number of concurrent multipart copy tasks when copying an object. The default value is the value of **defaultParallels** in the configuration file.
threshold	Optional (additional parameter)	The threshold for enabling multipart copy. If the size of the object to be copied is smaller than the threshold, copy the object directly. If not, a multipart copy is required. The default value is the value of **defaultBigfileThreshold** in the configuration file. Unit: byte This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes). **NOTE** If you copy an object directly, no part record is generated, and resumable transmission is not supported.
versionId	Optional for copying an object (additional parameter)	The source object version ID that can be specified when copying an object

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Parameter	Optional or Mandatory	Description
acl	Optional (additional parameter)	The access control policies for destination objects that can be specified when copying objects Possible values are: • **private**: Only users granted permissions by the object ACL can access the object. • **public-read**: Anyone can read objects in the bucket. • **public-read-write**: Anyone can read, write, or delete objects in the bucket. • **bucket-owner-full-control**: Only the bucket owner has full control over objects in the bucket.
sc	Optional (additional parameter)	The storage classes of the destination objects that can be specified when copying objects Possible values are: • **standard**: Standard storage class. It features low access latency and high throughput, and is applicable to storing frequently accessed data (multiple accesses per month) or data that is smaller than 1 MB. • **warm**: Infrequent Access storage class. It is ideal for storing infrequently accessed (less than 12 times a year) data, but when needed, the access has to be fast. • **cold**: Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once a year) data. • **deep-archive**: Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely (once every few years) accessed. This storage class costs less than the Archive storage class, but takes longer time (usually several hours) to restore data.

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Parameter	Optional or Mandatory	Description
meta	Optional (additional parameter)	The standard or user-defined metadata that can be specified during object replication. • Standard metadata includes **Content-Type**, **Content-Encoding**, **Cache-Control**, **Content-Disposition**, **Content-Language** and **Expires**. • User-defined metadata must be in the format of *key:value*. Multiple user-defined metadata items are separated by number signs (#), for example, *key1:value1*#*key2:value2*#*key3:value3*, which indicates that the object copy in the destination bucket contains three groups of user-defined metadata: *key1:value1*, *key2:value2*, and *key3:value3*.
fs	Optional (additional parameter)	Whether the method of listing parallel file systems is applied. If you are listing parallel file systems, you are recommended to add this parameter. • After this parameter is enabled, **marker** and **limit** will be ignored. Then, the size of the bucket, parallel file system, or directory will be calculated. • This parameter is only supported by obsutil 5.5.12 and later. • With this method, the listing time required varies largely depending on the directory structures.
ps	Optional (additional parameter)	The size of each part in a multipart copy task • The default value is the value of **defaultPartSize** in the configuration file. The parameter can be set to **auto**. In this case, obsutil automatically configures the part size for each multipart task based on the source file size. • Range: **100KB** to **5GB** • Unit: byte. This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes).

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Parameter	Optional or Mandatory	Description
cpd	Optional (additional parameter)	The folder where the part records reside. The default value is **.obsutil_checkpoint**, the subfolder in the home directory of the user who executes obsutil commands. A part record is generated during a multipart copy and saved to the **upload** subfolder. After the copy succeeds, its part record is deleted automatically. If the copy fails or is suspended, the system attempts to resume the task according to its part record when you perform the copy the next time.
r	Mandatory for copying objects in batches (additional parameter)	Copies objects in batches based on a specified name prefix of objects in the source bucket.
f	Optional for copying objects in batches (additional parameter)	Runs in force mode.
j	Optional for copying objects in batches (additional parameter)	The maximum number of concurrent tasks for copying objects in batches. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.

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Parameter	Optional or Mandatory	Description
exclude	Optional for copying objects in batches (additional parameter)	The matching patterns of source objects that are excluded. After this parameter is specified, if the name of the object to be copied matches the value of this parameter, the object is skipped. For example, if this parameter is set to ***.txt**, all files whose names end with **.txt** are skipped and not copied. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent ***** and **\?** to represent **?**. ● Multiple **exclude** parameters can be specified, for example, **-exclude=*.xxx -exclude=*.xxx**. **Restrictions**: This matching pattern applies only to objects whose names do not end with a slash (/). **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute path of an object, including the object name prefix and object name starting from the root directory. For example, if the path of an object in the bucket is **obs://bucket/src1/src2/test.txt**, then the absolute path of the object is **src1/src2/test.txt**.

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Parameter	Optional or Mandatory	Description
include	Optional for copying objects in batches (additional parameter)	The included matching patterns of source objects. After this parameter is specified, if the name of the object to be copied matches the value of this parameter, the object is copied. For example, if this parameter is set to ***.txt**, all objects whose names end with **.txt** are copied. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent * and **\?** to represent **?**. ● Multiple **include** parameters can be specified, for example, **-include=*.xxx -include=*.xxx**. **Restrictions**: ● This matching pattern applies only to objects whose names do not end with a slash (/). ● If both the **exclude** and **include** parameters are configured, the **exclude** rules are applied first. If the name of an object to be copied does not match **exclude**, OBS checks whether the object name matches the value of **include**. If yes, the object is copied. If no, the object is skipped. **Example:** ./obsutil cp obs://src-bucket/ obs://target-bucket/ -include=/src-object/* -f -r This command copies files whose names start with **src-object/** from the **src-bucket** bucket to the **target-bucket** bucket. **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute path of an object, including the object name prefix and object name starting from the root directory. For example, if the path of an object in the bucket is **obs://bucket/src1/src2/test.txt**, then the absolute path of the object is **src1/src2/test.txt**.

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Parameter	Optional or Mandatory	Description
timeRange	Optional for copying objects in batches (additional parameter)	The time range matching pattern when copying objects. Only objects whose latest modification time is within the configured time range are copied. This pattern has a lower priority than the file matching patterns (**exclude**/**include**). That is, the time range matching pattern is executed after the configured file matching patterns. ● Time in the matching pattern is the UTC time. ● The matching time range is represented in *time1*-*time2*, where *time1* must be earlier than or the same as *time2*. The time format is *yyyyMMddHHmmss*. ● Automatic formatting is supported. For example, *yyyyMMdd* is equivalent to *yyyyMMdd***000000**, and *yyyyMM* is equivalent to *yyyyMM***01000000**. ● If this parameter is set to ***-***time2*, all files whose last modification time is earlier than *time2* are matched. If it is set to *time1*-*, all files whose last modification time is later than *time1* are matched. **This matching pattern applies only to objects whose names do not end with a slash (/).**
mf	Optional (additional parameter)	Indicates that the name matching pattern (**include** or **exclude**) and the time matching pattern (**timeRange**) also take effect on objects whose names end with a slash (/).

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Parameter	Optional or Mandatory	Description
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (possibly success, failure, and warning files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. • A result file should be named as follows: **cp_{succeed | failed | warning}_report**_*time*_*TaskId*.**txt**. • By default, the maximum size of a single result file is 30 MB. You can set the maximum size by configuring **recordMaxLogSize** in the configuration file. • By default, the maximum number of result files that can be retained is 1,024. You can set the maximum number by configuring **recordBackups** in the configuration file. • If there are multiple folders and files and you need to confirm the details of a failed task, refer to the failure result file **cp_failed_report**_*time*_*TaskId*.**txt** in the result folder and the **log files** in the log path.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Response

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Field	Description
Parallel	The parameter **-p** in the request
Jobs	The parameter **-j** in the request
Threshold	The parameter **-threshold** in the request
PartSize	The parameter **-ps** in the request
Exclude	The parameter **-exclude** in the request
Include	The parameter **-include** in the request
TimeRange	The parameter **-timeRange** in the request
VerifyLength	The parameter **-vlength** in the request
VerifyMd5	The parameter **-vmd5** in the request
CheckpointDir	The parameter **-cpd** in the request
OutputDir	The parameter **-o** in the request
ArcDir	The parameter **-arcDir** in the request
Succeed count	The number of successful tasks
Failed count	The number of failed tasks
Skip count	The number of tasks that are skipped during incremental upload, download, or copy, and synchronous upload, download, or copy. **NOTE** Skipped tasks are recorded into successful tasks.
Warning count	The number of tasks that are executed successfully but contain warnings. **NOTE** • The task for which a warning is generated may be a failure or a success, which needs to be further determined according to the corresponding result list. • The number of tasks that generate warnings is independent of the number of successful or failed tasks. The total number of tasks is the number of successful tasks plus the number of failed tasks.
Succeed bytes	The number of bytes that are successfully uploaded or downloaded.
max cost	The maximum duration of all tasks, in ms
min cost	The minimum duration of all tasks, in ms
average cost	The average duration of all tasks, in ms
average tps	The average number of tasks completed per second
Task id	The unique ID of an operation, which is used to search for the result file generated for a batch task

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4.6.3 Configuring, Editing, and Viewing Object Metadata

Scenarios

Object metadata is a set of name-value pairs that describe an object and is used for object management. OBS has two types of metadata: **system-defined object metadata** and **user-defined object metadata**. System-defined metadata includes the object's creation date, size, and storage class. User-defined metadata is the metadata that you can set for an object to identify the purpose or properties of the object.

You can configure metadata for an object when uploading it or edit the metadata after the object is uploaded.

Metadata Introduction

System-defined Object Metadata

There are two types of system-defined metadata: system-controlled and user-controlled.

- **System-controlled**: metadata that is controlled by the system and cannot be edited by users, for example, **LastModified**
- **User-controlled**: metadata whose value you can control. For example, if you use an OBS bucket to host a static web page and you might want to redirect requests for the hosted page to another page or an external URL, you can configure **WebsiteRedirectLocation** for the page. In this case, OBS stores the redirection value as system metadata that you can control. **Table 4-4** lists the metadata items that you can control.

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Table 4-4 OBS metadata

Metadata	Description	Changeable by User or Not
ContentDisposition	Controls how a browser handles the content it receives. Especially during file downloads, this metadata directs the browser to either display the file inline or prompt the user to download it to their device, optionally with a specified filename. The metadata values can be: • **ContentDisposition: inline**: The file content is displayed for preview. If the bucket **does not have a user-defined domain name**, the **ContentDisposition: inline** setting for the object will be ignored. OBS **will forcibly return** the **ContentDisposition: attachment** header. • **ContentDisposition: attachment**: The file is downloaded to the browser's specified path with its original filename. • **ContentDisposition: attachment; filename="testfile.xls"**: The file is downloaded to the browser's specified path with the filename **testfile.xls**. **NOTE** If the file name contains special characters, it may be escaped when the file is downloaded to the local device. To ensure that the file name is correctly displayed in different browsers, you can use URL encoding or RFC 5987 encoding. The following gives some examples: • URL encoding: **ContentDisposition: attachment; filename="test file.xls"; filename="test%20file.xls"** • RFC 5987 encoding: **ContentDisposition: attachment; filename="test file.xls"; filename*=UTF-8''test%20file.xls** For more information, see the definition of **ContentDisposition** in the HTTP protocol.	Yes

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Metadata	Description	Changeable by User or Not
ContentLanguage	States the language or languages intended for the audience. The metadata values can be: • **ContentLanguage: zh-CN**: simplified Chinese • **Content-Language: en-US**: English • **Content-Language: fr-FR**: French • **Content-Language: es-ES**: Spanish **NOTE** Separated multiple languages with commas (,), for example, **Content-Language: en-US, fr-FR**. For more information, see the definition of **ContentLanguage** in the HTTP protocol.	Yes

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Metadata	Description	Changeable by User or Not
WebsiteRedirectLocation	Redirects requests for an object to another object or an external URL. If redirection is configured for an object, the response returned upon a request for that object will include the **WebsiteRedirectLocation** header to tell the URL to which the request should be redirected. The redirection is implemented using static website hosting. The format is **WebsiteRedirectLocation:** *<url>*, where *<url>* indicates the target URL of redirection. OBS **only supports redirection for objects in a bucket's root directory**. Redirection for objects in the bucket's folders is not supported. For example, you can redirect requests for an object by doing as follows: 1. Configure the **WebsiteRedirectLocation** metadata for object **testobject.html** in the root directory of bucket **testbucket** and set the metadata value to **http://www.example.com**. 2. Configure static website hosting for bucket **testbucket**, and set object **testobject.html** as the default homepage. 3. Access object **testobject.html** through the URL provided on the static website hosting page. The access will be redirected to **http://www.example.com**.	Yes

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Metadata	Description	Changeable by User or Not
ContentEncoding	Specifies the content encoding format when an object is downloaded. This metadata tells a client to decode objects according to their encoding format, so that the content can be correctly displayed or processed. The value options are as follows: • Standard: – **identity**: The content is not encoded. – **gzip**: The content is compressed using GNU zip (gzip). gzip is the most common algorithm that can be used for all kinds of data. – **compress**: The content is compressed using Lempel-Ziv-Welch (LZW). LZW is rarely used. – **deflate**: The content is compressed using an algorithm in zlib format. zlib uses DEFLATE internally and is rarely used. – **exi**: The content is compressed using Efficient XML Interchange (EXI). EXI is only used for XML data. – **pack200-gzip**: The content is compressed using Java Pack200 and then gzip. This compression method is specially designed for Java Archive (JAR) files. • Others: – **br**: The content is compressed using Brotli. Most browsers support this algorithm. – **bzip2**: The content is compressed using bzip2. This algorithm has an excellent compression ratio, but a slow compression speed. – **lzma**: The content is compressed using Lempel–Ziv–Markov chain algorithm (LZMA). This algorithm has an excellent compression ratio, but a slow compression speed. – **peerdist**: The content is distributed using PDP.	Yes

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Metadata	Description	Changeable by User or Not
	– **sdch**: The content is compressed using Shared Dictionary Compression for HTTP (SDCH). This algorithm uses a shared dictionary for efficient compression. – **xpress**: The content is compressed using Xpress. This algorithm is rarely used and is used in specific scenarios. – **xz**: The content is compressed using XZ. XZ uses LZMA2 internally, and has an excellent compression ratio, but a slow compression speed.	

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Metadata	Description	Changeable by User or Not
CacheControl	Specifies the caching behavior for a web page when an object is downloaded. The value options are as follows: ● **Cacheability**: – **public**: Content related to requests or responses can be stored in any cache, including private and shared caches. – **private**: Content related to requests or responses can only be stored in private caches. – **no-cache**: The cache does not store any content related to requests or responses. – **only-if-cached**: Only resources in the cache are accepted. No revalidation is performed. ● **Expiration time**: – **max-age=<*seconds*>**: It sets the maximum amount of time that a client considers a resource fresh. – **s-maxage=<*seconds*>**: It sets the maximum amount of time that a shared cache can store a resource before it must revalidate the resource. – **max-stale[=<*seconds*>]**: It sets how long a client can tolerate expired resources. – **min-fresh=<*seconds*>**: It sets the minimum amount of time that a client considers a resource fresh. – **stale-while-revalidate=<*seconds*>**: The cache continues to use the cached resource after the resource expires, and revalidates the resource freshness in the background. – **stale-if-error=<*seconds*>**: The cache uses the cached resource when there is a network error or the revalidation fails. ● Revalidation and reload:	Yes

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Metadata	Description	Changeable by User or Not
	– **must-revalidate**: The cache must revalidate resources after they expire. – **proxy-revalidate**: It is similar to **must-revalidate**, but it applies only to shared caches. – **immutable**: Resources will not change during their cache lifetime. The cache can use the cached resources indefinitely without revalidation. • Others: **no-store**: The client does not store any requests or responses. **no-transform**: The cache server does not modify resources. The cache server may compress resources or convert their format to optimize transmission.	
Expires	Specifies the cache expiration time (GMT).	Yes
ContentType	Specifies the object type. It determines the format and encoding method a browser will use to read the file. For details, see **Table 4-5**.	Yes
Date	Specifies the current date and time. Example: **WED, 01 Jul 2015 04:19:21 GMT**	No
Content-Length	Specifies the object size. Unit: byte	No
Last-Modified	Specifies the date and time when an object was first uploaded or last modified. Example: **WED, 01 Jul 2015 04:19:21 GMT** In a multipart upload, the object's creation date is when the multipart upload started.	No
ETag	Base64-encoded 128-bit MD5 digest of an object. ETag is the unique identifier of the object content. It reflects whether the object content is changed. For example, if the ETag value is **A** when an object is uploaded but is **B** when the object is downloaded, it means that the object content has been changed. The ETag value is a hash of the object.	No

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Metadata	Description	Changeable by User or Not
x-obs-tagging-count	The number of tags associated with an object. For example, **x-obs-tagging-count:1** indicates that the object has one tag.	No
x-obs-version-id	The object version ID. When versioning is enabled for a bucket, OBS assigns a version ID to each object in the bucket. For more information, see **Versioning**.	No
x-obs-storage-class	The storage class of an object. The value can be: • **STANDARD**: the Standard storage class • **WARM**: the Infrequent Access storage class • **COLD**: the Archive storage class • **DEEP_ARCHIVE**: the Deep Archive storage class	Yes

NOTE

For more information about object metadata, see **Object Metadata**.

Object Metadata Content-Type

When you access an object through a web browser, the browser uses the object's **Content-Type** to determine how to handle and display the object. You can change an object's **Content-Type** based on its file name extension.

NOTE

- If you upload an object by calling an API, specify the value of **Content-Type**.
- If you upload an object through **OBS Console**, OBS automatically assigns the Content-Type based on the file name extension of the object.
- If the value of **Content-Type** does not match the file name extension, the file name extension will change after the file is downloaded.

Table 4-5 Common Content-Type values

File Name Extension	Content-Type	File Name Extension	Content-Type
.* (binary stream, unknown file type)	application/octet-stream	.7z	application/x-7z-compressed
.001	application/x-001	.301	application/x-301

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File Name Extension	Content-Type	File Name Extension	Content-Type
.323	text/h323	.906	application/x-906
.907	drawing/907	.a11	application/x-a11
.acp	audio/x-mei-aac	.ai	application/postscript
.aif	audio/aiff	.aifc	audio/aiff
.aiff	audio/aiff	.anv	application/x-anv
.asa	text/asa	.asf	video/x-ms-asf
.asp	text/asp	.asx	video/x-ms-asf
.au	audio/basic	.avi	video/avi
.awf	application/vnd.adobe.workflow	.biz	text/xml
.bmp	application/x-bmp	.bot	application/x-bot
.c4t	application/x-c4t	.c90	application/x-c90
.cal	application/x-cals	.cat	application/vnd.ms-pki.seccat
.cdf	application/x-netcdf	.cdr	application/x-cdr
.cel	application/x-cel	.cer	application/x-x509-ca-cert
.cg4	application/x-g4	.cgm	application/x-cgm
.cit	application/x-cit	.class	java/*
.cml	text/xml	.cmp	application/x-cmp
.cmx	application/x-cmx	.cot	application/x-cot
.crl	application/pkix-crl	.crt	application/x-x509-ca-cert
.csi	application/x-csi	.css	text/css
.cut	application/x-cut	.dbf	application/x-dbf
.dbm	application/x-dbm	.dbx	application/x-dbx
.dcd	text/xml	.dcx	application/x-dcx
.der	application/x-x509-ca-cert	.dgn	application/x-dgn

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File Name Extension	Content-Type	File Name Extension	Content-Type
.dib	application/x-dib	.dll	application/x-msdownload
.doc	application/msword	.dot	application/msword
.drw	application/x-drw	.dtd	text/xml
.dwf	Model/vnd.dwf	.dwf	application/x-dwf
.dwg	application/x-dwg	.dxb	application/x-dxb
.dxf	application/x-dxf	.edn	application/vnd.adobe.edn
.emf	application/x-emf	.eml	message/rfc822
.ent	text/xml	.epi	application/x-epi
.eps	application/x-ps	.eps	application/postscript
.etd	application/x-ebx	.exe	application/x-msdownload
.fax	image/fax	.fdf	application/vnd.fdf
.fif	application/fractals	.fo	text/xml
.frm	application/x-frm	.g4	application/x-g4
.gbr	application/x-gbr	.	application/x-
.gif	image/gif	.gl2	application/x-gl2
.gp4	application/x-gp4	.hgl	application/x-hgl
.hmr	application/x-hmr	.hpg	application/x-hpgl
.hpl	application/x-hpl	.hqx	application/mac-binhex40
.hrf	application/x-hrf	.hta	application/hta
.htc	text/x-component	.htm	text/html
.html	text/html	.htt	text/webviewhtml
.htx	text/html	.icb	application/x-icb
.ico	image/x-icon	.ico	application/x-ico
.iff	application/x-iff	.ig4	application/x-g4

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File Name Extension	Content-Type	File Name Extension	Content-Type
.igs	application/x-igs	.iii	application/x-iphone
.img	application/x-img	.ins	application/x-internet-signup
.isp	application/x-internet-signup	.IVF	video/x-ivf
.java	java/*	.jfif	image/jpeg
.jpe	image/jpeg	.jpe	application/x-jpe
.jpeg	image/jpeg	.jpg	image/jpeg
.jpg	application/x-jpg	.js	application/x-javascript
.jsp	text/html	.la1	audio/x-liquid-file
.lar	application/x-laplayer-reg	.latex	application/x-latex
.lavs	audio/x-liquid-secure	.lbm	application/x-lbm
.lmsff	audio/x-la-lms	.ls	application/x-javascript
.ltr	application/x-ltr	.m1v	video/x-mpeg
.m2v	video/x-mpeg	.m3u	audio/mpegurl
.m4e	video/mpeg4	.mac	application/x-mac
.man	application/x-troff-man	.math	text/xml
.mdb	application/msaccess	.mdb	application/x-mdb
.mfp	application/x-shockwave-flash	.mht	message/rfc822
.mhtml	message/rfc822	.mi	application/x-mi
.mid	audio/mid	.midi	audio/mid
.mil	application/x-mil	.mml	text/xml
.mnd	audio/x-musicnet-download	.mns	audio/x-musicnet-stream
.mocha	application/x-javascript	.movie	video/x-sgi-movie

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File Name Extension	Content-Type	File Name Extension	Content-Type
.mp1	audio/mp1	.mp2	audio/mp2
.mp2v	video/mpeg	.mp3	audio/mp3
.mp4	video/mp4	.mpa	video/x-mpg
.mpd	application/vnd.ms-project	.mpe	video/x-mpeg
.mpeg	video/mpg	.mpg	video/mpg
.mpga	audio/rn-mpeg	.mpp	application/vnd.ms-project
.mps	video/x-mpeg	.mpt	application/vnd.ms-project
.mpv	video/mpg	.mpv2	video/mpeg
.mpw	application/vnd.ms-project	.mpx	application/vnd.ms-project
.mtx	text/xml	.mxp	application/x-mmxp
.net	image/pnetvue	.nrf	application/x-nrf
.nws	message/rfc822	.odc	text/x-ms-odc
.out	application/x-out	.p10	application/pkcs10
.p12	application/x-pkcs12	.p7b	application/x-pkcs7-certificates
.p7c	application/pkcs7-mime	.p7m	application/pkcs7-mime
.p7r	application/x-pkcs7-certreqresp	.p7s	application/pkcs7-signature
.pc5	application/x-pc5	.pci	application/x-pci
.pcl	application/x-pcl	.pcx	application/x-pcx
.pdf	application/pdf	.pdf	application/pdf
.pdx	application/vnd.adobe.pdx	.pfx	application/x-pkcs12
.pgl	application/x-pgl	.pic	application/x-pic
.pko	application/vnd.ms-pki.pko	.pl	application/x-perl
.plg	text/html	.pls	audio/scpls

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File Name Extension	Content-Type	File Name Extension	Content-Type
.plt	application/x-plt	.png	image/png
.png	application/x-png	.pot	application/vnd.ms-powerpoint
.ppa	application/vnd.ms-powerpoint	.ppm	application/x-ppm
.pps	application/vnd.ms-powerpoint	.ppt	application/vnd.ms-powerpoint
.ppt	application/x-ppt	.pr	application/x-pr
.prf	application/pics-rules	.prn	application/x-prn
.prt	application/x-prt	.ps	application/x-ps
.ps	application/postscript	.ptn	application/x-ptn
.pwz	application/vnd.ms-powerpoint	.r3t	text/vnd.rn-realtext3d
.ra	audio/vnd.rn-realaudio	.ram	audio/x-pn-realaudio
.ras	application/x-ras	.rat	application/rat-file
.rdf	text/xml	.rec	application/vnd.rn-recording
.red	application/x-red	.rgb	application/x-rgb
.rjs	application/vnd.rn-realsystem-rjs	.rjt	application/vnd.rn-realsystem-rjt
.rlc	application/x-rlc	.rle	application/x-rle
.rm	application/vnd.rn-realmedia	.rmf	application/vnd.adobe.rmf
.rmi	audio/mid	.rmj	application/vnd.rn-realsystem-rmj
.rmm	audio/x-pn-realaudio	.rmp	application/vnd.rn-rn_music_package

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File Name Extension	Content-Type	File Name Extension	Content-Type
.rms	application/vnd.rn-realmedia-secure	.rmvb	application/vnd.rn-realmedia-vbr
.rmx	application/vnd.rn-realsystem-rmx	.rnx	application/vnd.rn-realplayer
.rp	image/vnd.rn-realpix	.rpm	audio/x-pn-realaudio-plugin
.rsml	application/vnd.rn-rsml	.rt	text/vnd.rn-realtext
.rtf	application/msword	.rtf	application/x-rtf
.rv	video/vnd.rn-realvideo	.sam	application/x-sam
.sat	application/x-sat	.sdp	application/sdp
.sdw	application/x-sdw	.sit	application/x-stuffit
.slb	application/x-slb	.sld	application/x-sld
.slk	drawing/x-slk	.smi	application/smil
.smil	application/smil	.smk	application/x-smk
.snd	audio/basic	.sol	text/plain
.sor	text/plain	.spc	application/x-pkcs7-certificates
.spl	application/futuresplash	.spp	text/xml
.ssm	application/streamingmedia	.sst	application/vnd.ms-pki.certstore
.stl	application/vnd.ms-pki.stl	.stm	text/html
.sty	application/x-sty	.svg	text/xml
.swf	application/x-shockwave-flash	.tdf	application/x-tdf
.tg4	application/x-tg4	.tga	application/x-tga
.tif	image/tiff	.tif	application/x-tif
.tiff	image/tiff	.tld	text/xml

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File Name Extension	Content-Type	File Name Extension	Content-Type
.top	drawing/x-top	.torrent	application/x-bittorrent
.tsd	text/xml	.txt	text/plain **NOTE** If you want to preview a TXT file online, set **Content-Type** to **text/plain;charset=UTF-8** to avoid garbled characters.
.uin	application/x-icq	.uls	text/iuls
.vcf	text/x-vcard	.vda	application/x-vda
.vdx	application/vnd.visio	.vml	text/xml
.vpg	application/x-vpeg005	.vsd	application/vnd.visio
.vsd	application/x-vsd	.vss	application/vnd.visio
.vst	application/vnd.visio	.vst	application/x-vst
.vsw	application/vnd.visio	.vsx	application/vnd.visio
.vtx	application/vnd.visio	.vxml	text/xml
.wav	audio/wav	.wax	audio/x-ms-wax
.wb1	application/x-wb1	.wb2	application/x-wb2
.wb3	application/x-wb3	.wbmp	image/vnd.wap.wbmp
.wiz	application/msword	.wk3	application/x-wk3
.wk4	application/x-wk4	.wkq	application/x-wkq
.wks	application/x-wks	.wm	video/x-ms-wm
.wma	audio/x-ms-wma	.wmd	application/x-ms-wmd
.wmf	application/x-wmf	.wml	text/vnd.wap.wml
.wmv	video/x-ms-wmv	.wmx	video/x-ms-wmx

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File Name Extension	Content-Type	File Name Extension	Content-Type
.wmz	application/x-ms-wmz	.wp6	application/x-wp6
.wpd	application/x-wpd	.wpg	application/x-wpg
.wpl	application/vnd.ms-wpl	.wq1	application/x-wq1
.wr1	application/x-wr1	.wri	application/x-wri
.wrk	application/x-wrk	.ws	application/x-ws
.ws2	application/x-ws	.wsc	text/scriptlet
.wsdl	text/xml	.wvx	video/x-ms-wvx
.xdp	application/vnd.adobe.xdp	.xdr	text/xml
.xfd	application/vnd.adobe.xfd	.xfdf	application/vnd.adobe.xfdf
.xhtml	text/html	.xlsx	application/vnd.openxmlformats-officedocument.spreadsheetml.sheet
.xls	application/x-xls	.xlw	application/x-xlw
.xml	text/xml	.xpl	audio/scpls
.xq	text/xml	.xql	text/xml
.xquery	text/xml	.xsd	text/xml
.xsl	text/xml	.xslt	text/xml
.xwd	application/x-xwd	.x_b	application/x-x_b
.sis	application/vnd.symbian.install	.sisx	application/vnd.symbian.install
.x_t	application/x-x_t	.ipa	application/vnd.iphone
.apk	application/vnd.android.package-archive	.xap	application/x-silverlight-app
.zip	application/zip	.rar	application/x-rar-compressed

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User-defined Object Metadata

You can add user-defined metadata headers that start with **x-obs-meta-** for easy object management. When you retrieve an object or query its metadata, any user-defined metadata added will appear in the response.

NOTE

- An object's checksum and its associated algorithm are stored as part of the object metadata. Metadata provides additional information about an object and is not included in the actual object content.
- When you use a KMS key to encrypt an object, KMS encrypts only the actual content of the object. If you use OBS server-side encryption to encrypt an object, both the object's actual content and checksum are encrypted. The encrypted checksum is then stored in the object metadata. For more information about server-side encryption, see **Server-Side Encryption Overview**.
- A checksum (the **x-obs-meta-md5chksum** user-defined metadata) is used to verify data integrity and consistency. It is usually calculated using an algorithm (for example, MD5).

User-defined object metadata must meet the following requirements:

- All user-defined metadata is limited to 8 KB in size. The size of user-defined metadata is the sum of the number of bytes in the UTF-8 encoding of each key and value.
- User-defined metadata keys are case insensitive, but OBS stores them in lowercase. The user-defined metadata values are case sensitive.

  Example:

  ```
  PUT /key HTTP/1.1
  Host: bucket01.obs.myhuaweicloud.com
  x-obs-meta-Test1: Test Meta1

  HEAD /Key HTTP/1.1
  Host: bucket01.obs.myhuaweicloud.com
  x-obs-meta-test1: Test Meta1
  ```

- Both user-defined metadata keys and their values must conform to US-ASCII. If non-ASCII or unrecognizable characters are necessary, they must be encoded or decoded in URL or Base64 on the client side. The server side does not perform any decoding.

Constraints

- In a versioning-enabled bucket, you can only configure metadata for the latest version of an object, but not for historical versions.
- Metadata cannot be configured for Archive or Deep Archive objects.
- The total size of user-defined metadata is limited to 8 KB.
- For the permissions required to configure, edit, or view object metadata, see **Object Actions**.

Ways to Configure Object Metadata

You can use **OBS Console**, APIs, SDKs, or obsutil to configure object metadata.

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Using OBS Console

Step 1 In the navigation pane of OBS **Console**, choose **Object Storage**.

Step 2 In the bucket list of **OBS Console**, click the desired bucket to go to the **Objects** page.

Step 3 Click the required object name to go to the object details page.

Step 4 On the **Metadata** tab, click **Add** and specify metadata information. For more information, see **Metadata Introduction**.

Figure 4-9 Adding metadata

Step 5 Click **OK**.

----End

Using APIs

Modifying Object Metadata

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
  - Setting properties of a single object
    ```
    obsutil chattri obs://bucket/key [-meta=aaa:bbb#ccc:ddd] [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-versionId=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Setting properties of objects in batches
    ```
    obsutil chattri obs://bucket[/key] -r [-f] [-v] [-meta=aaa:bbb#ccc:ddd] [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-o=xxx] [-j=1] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

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- In Linux or macOS
  - Setting properties of a single object
    ```
    ./obsutil chattri obs://bucket/key [-meta=aaa:bbb#ccc:ddd] [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-versionId=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Setting properties of objects in batches
    ```
    ./obsutil chattri obs://bucket[/key] -r [-f] [-v] [-meta=aaa:bbb#ccc:ddd] [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-o=xxx] [-j=1] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

Examples

- Take the Windows OS as an example, run the **obsutil chattri obs://bucket-test/key -acl=public-read** command to set the access permission to an object to public read.
  ```
  obsutil chattri obs://bucket-test/key -acl=public-read
  Start at 2024-09-30 08:17:15.5572914 +0000 UTC

  Set the acl of object [key] in the bucket [bucket-test] to [public-read] successfully, request id [04050000016836DDFA73B2B5320E2651]
  ```
- Take the Windows OS as an example, run the **obsutil chattri obs://bucket-test -r -f -acl=public-read** command to set the access permission to all objects in the bucket to public read.
  ```
  obsutil chattri obs://bucket-test -r -f -acl=public-read
  Start at 2024-09-30 08:18:03.105373 +0000 UTC

  [-------------------------------------------------] 100.00% tps:155.15 5/5 233ms
  Succeed count:  5       Failed count:   0
  Metrics [max cost:177 ms, min cost:53 ms, average cost:102.40 ms, average tps:20.41]
  Task id: 9d7f73ff-f747-4fdd-9b2a-815ba2dc3b07
  ```

Parameter Description

Parameter	Optional or Mandatory	Description
bucket	Mandatory	The name of the bucket to which an object belongs
key	Mandatory when setting properties of an object. Optional when setting properties of objects in batches.	The name of the object whose properties are to be set, or the name prefix of objects whose properties are to be set in batches If this parameter is left blank during batch operation, properties of all objects in the bucket are set.

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Parameter	Optional or Mandatory	Description
meta	Optional (additional parameter)	The standard or user-defined metadata that can be specified for an object when setting properties of the object • Standard metadata includes **Content-Type**, **Content-Encoding**, **Cache-Control**, **Content-Disposition**, **Content-Language** and **Expires**. • User-defined metadata must be in the format of *key:value*. Multiple user-defined metadata items are separated by number signs (#), for example, *key1:value1*#*key2:value2*#*key3:value3*, which indicates that the object whose properties are set contains three groups of user-defined metadata: *key1:value1*, *key2:value2*, and *key3:value3*. **This parameter must be used together with direct.**
direct	Optional (additional parameter)	The metadata operation indicator The value can be: • **REPLACE_NEW**: The existing metadata value is replaced with a new one, the metadata lacking a value is assigned one, and the metadata not specified keeps unchanged. • **REPLACE**: The metadata is replaced with the header included in the current request and the metadata not specified is deleted. **This parameter must be used together with meta.**

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Parameter	Optional or Mandatory	Description
sc	Optional (additional parameter)	The storage class of an object. Possible values are: • **standard**: Standard storage class. It features low access latency and high throughput, and is applicable to storing frequently accessed data (multiple accesses per month) or data that is smaller than 1 MB. • **warm**: Infrequent Access storage class. It is ideal for storing infrequently accessed (less than 12 times a year) data, but when needed, the access has to be fast. • **cold**: Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once a year) data. • **deep-archive**: Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely (once every few years) accessed. This storage class costs less than the Archive storage class, but takes longer time (usually several hours) to restore data. **For an object whose storage class is cold, restore the object first and then specify its storage class.** To restore an object, see **Restoring an Object**.
acl	Optional (additional parameter)	The predefined access control policy of an object. Possible values are: • private • public-read • public-read-write • bucket-owner-full-control

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Parameter	Optional or Mandatory	Description
aclXml	Optional (additional parameter)	The bucket's access control policy, in XML format. The format is as follows: <AccessControlPolicy> <Owner> <ID>*ownerid*</ID> </Owner> <AccessControlList> <Grant> <Grantee> <ID>*userid*</ID> </Grantee> <Permission>*[WRITE|WRITE_ACP|READ|READ_ACP|FULL_CONTROL]*</Permission> </Grant> <Grant> <Grantee> <Canned>Everyone</Canned> </Grantee> <Permission>*[WRITE|WRITE_ACP|READ|READ_ACP|FULL_CONTROL]*</Permission> </Grant> </AccessControlList> </AccessControlPolicy> • **Owner**: Optional. Specify the object owner's ID. • In **AccessControlList**, the **Grant** field contains the authorized users. **Grantee** specifies the IDs of authorized users. **Canned** specifies the authorized user group (currently, only **Everyone** is supported). • The following permissions can be granted: – **WRITE**: the write permission – **WRITE_ACP**: the write permission for the ACL – **READ**: the read permission – **READ_ACP**: the read permission for the ACL – **FULL_CONTROL**: the full control permission **Because angle brackets (<) and (>) are unavoidably included in the parameter value, you must use quotation marks to enclose them for escaping when running the command.** Use single quotation marks for Linux or macOS and double quotation marks for Windows.

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Parameter	Optional or Mandatory	Description
fs	Optional (additional parameter)	Whether the method of listing parallel file systems is applied. If you are listing parallel file systems, you are recommended to add this parameter. • After this parameter is enabled, **marker** and **limit** will be ignored. Then, the size of the bucket, parallel file system, or directory will be calculated. • This parameter is only supported by obsutil 5.5.12 and later. • With this method, the listing time required varies largely depending on the directory structures.
versionId	Optional when setting properties of an object (additional parameter)	The version ID of the object whose properties are to be set
fr	Optional when setting properties of an object (additional parameter)	Generates an operation result file when setting properties of an object.
f	Optional when setting properties of objects in batches (additional parameter)	Runs in force mode.
r	Mandatory when setting properties of objects in batches (additional parameter)	Sets properties of objects in batches based on a specified object name prefix.
v	Optional when setting properties of objects in batches (additional parameter)	Sets properties of versions of objects in batches based on a specified object name prefix.

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Parameter	Optional or Mandatory	Description
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (including success and failure files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. • A result file should be named as follows: **cp_{succeed | failed | warning}_report**_*time*_*TaskId*.**txt**. • By default, the maximum size of a single result file is 30 MB. You can set the maximum size by configuring **recordMaxLogSize** in the configuration file. • By default, the maximum number of result files that can be retained is 1,024. You can set the maximum number by configuring **recordBackups** in the configuration file. • If there are multiple folders and files and you need to confirm the details of a failed task, refer to the failure result file **cp_failed_report**_*time*_*TaskId*.**txt** in the result folder and the **log files** in the log path.
j	Optional when setting properties of objects in batches (additional parameter)	The maximum number of concurrent tasks for setting object properties in batches. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK

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Parameter	Optional or Mandatory	Description
t	Optional (additional parameter)	The user's security token

NOTE

Only one from **acl**, **sc**, or **aclXml** can be set for each command.

Response

Field	Description
Parallel	The parameter **-p** in the request
Jobs	The parameter **-j** in the request
Threshold	The parameter **-threshold** in the request
PartSize	The parameter **-ps** in the request
Exclude	The parameter **-exclude** in the request
Include	The parameter **-include** in the request
TimeRange	The parameter **-timeRange** in the request
VerifyLength	The parameter **-vlength** in the request
VerifyMd5	The parameter **-vmd5** in the request
CheckpointDir	The parameter **-cpd** in the request
OutputDir	The parameter **-o** in the request
ArcDir	The parameter **-arcDir** in the request
Succeed count	The number of successful tasks
Failed count	The number of failed tasks
Skip count	The number of tasks that are skipped during incremental upload, download, or copy, and synchronous upload, download, or copy. **NOTE** Skipped tasks are recorded into successful tasks.

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Field	Description
Warning count	The number of tasks that are executed successfully but contain warnings. **NOTE** • The task for which a warning is generated may be a failure or a success, which needs to be further determined according to the corresponding result list. • The number of tasks that generate warnings is independent of the number of successful or failed tasks. The total number of tasks is the number of successful tasks plus the number of failed tasks.
Succeed bytes	The number of bytes that are successfully uploaded or downloaded.
max cost	The maximum duration of all tasks, in ms
min cost	The minimum duration of all tasks, in ms
average cost	The average duration of all tasks, in ms
average tps	The average number of tasks completed per second
Task id	The unique ID of an operation, which is used to search for the result file generated for a batch task

Ways to Edit Object Metadata

You can use **OBS Console**, APIs, SDKs, or obsutil to edit the metadata of an object.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Click the required object name to go to the object details page.

Step 4 On the **Metadata** tab, click **Edit** in the **Operation** column of the metadata to be edited.

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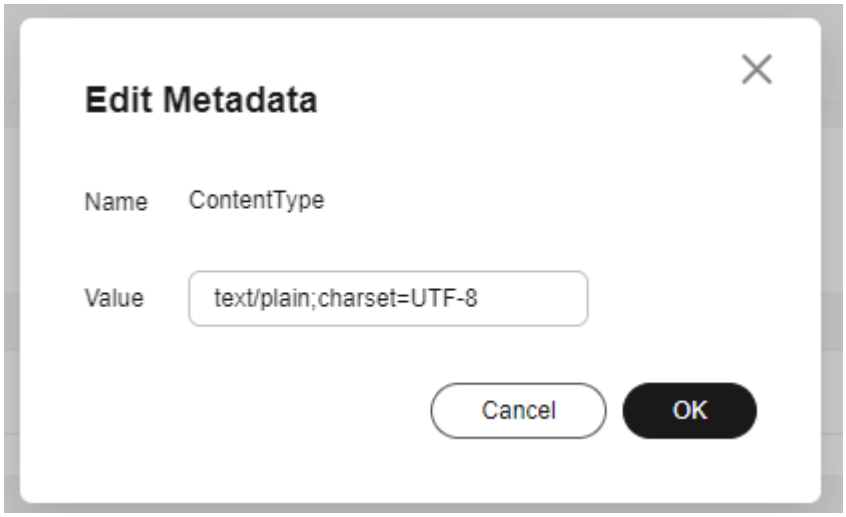
Figure 4-10 Editing the object metadata



Step 5 Change the metadata value and click **OK**. For more information, see **Metadata Introduction**.

----End

Using APIs

Modifying Object Metadata

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
  - Setting properties of a single object
    ```
    obsutil chattri obs://bucket/key [-meta=aaa:bbb#ccc:ddd] [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-versionId=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Setting properties of objects in batches
    ```
    obsutil chattri obs://bucket[/key] -r [-f] [-v] [-meta=aaa:bbb#ccc:ddd] [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-o=xxx] [-j=1] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
- In Linux or macOS
  - Setting properties of a single object
    ```
    ./obsutil chattri obs://bucket/key [-meta=aaa:bbb#ccc:ddd] [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-versionId=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Setting properties of objects in batches
    ```
    ./obsutil chattri obs://bucket[/key] -r [-f] [-v] [-meta=aaa:bbb#ccc:ddd] [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-o=xxx] [-j=1] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

Examples

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- Take the Windows OS as an example, run the **obsutil chattri obs://bucket-test/key -acl=public-read** command to set the access permission to an object to public read.

```
obsutil chattri obs://bucket-test/key -acl=public-read
Start at 2024-09-30 08:17:15.5572914 +0000 UTC

Set the acl of object [key] in the bucket [bucket-test] to [public-read] successfully, request id [04050000016836DDFA73B2B5320E2651]
```

- Take the Windows OS as an example, run the **obsutil chattri obs://bucket-test -r -f -acl=public-read** command to set the access permission to all objects in the bucket to public read.

```
obsutil chattri obs://bucket-test -r -f -acl=public-read
Start at 2024-09-30 08:18:03.105373 +0000 UTC

[------------------------------------------------] 100.00% tps:155.15 5/5 233ms
Succeed count:  5       Failed count:   0
Metrics [max cost:177 ms, min cost:53 ms, average cost:102.40 ms, average tps:20.41]
Task id: 9d7f73ff-f747-4fdd-9b2a-815ba2dc3b07
```

Parameter Description

Parameter	Optional or Mandatory	Description
bucket	Mandatory	The name of the bucket to which an object belongs
key	Mandatory when setting properties of an object. Optional when setting properties of objects in batches.	The name of the object whose properties are to be set, or the name prefix of objects whose properties are to be set in batches If this parameter is left blank during batch operation, properties of all objects in the bucket are set.
meta	Optional (additional parameter)	The standard or user-defined metadata that can be specified for an object when setting properties of the object ● Standard metadata includes **Content-Type**, **Content-Encoding**, **Cache-Control**, **Content-Disposition**, **Content-Language** and **Expires**. ● User-defined metadata must be in the format of *key:value*. Multiple user-defined metadata items are separated by number signs (#), for example, *key1:value1#key2:value2#key3:value3*, which indicates that the object whose properties are set contains three groups of user-defined metadata: *key1:value1*, *key2:value2*, and *key3:value3*. **This parameter must be used together with direct.**

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Parameter	Optional or Mandatory	Description
direct	Optional (additional parameter)	The metadata operation indicator The value can be: • **REPLACE_NEW**: The existing metadata value is replaced with a new one, the metadata lacking a value is assigned one, and the metadata not specified keeps unchanged. • **REPLACE**: The metadata is replaced with the header included in the current request and the metadata not specified is deleted. **This parameter must be used together with meta.**
sc	Optional (additional parameter)	The storage class of an object. Possible values are: • **standard**: Standard storage class. It features low access latency and high throughput, and is applicable to storing frequently accessed data (multiple accesses per month) or data that is smaller than 1 MB. • **warm**: Infrequent Access storage class. It is ideal for storing infrequently accessed (less than 12 times a year) data, but when needed, the access has to be fast. • **cold**: Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once a year) data. • **deep-archive**: Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely (once every few years) accessed. This storage class costs less than the Archive storage class, but takes longer time (usually several hours) to restore data. **For an object whose storage class is cold, restore the object first and then specify its storage class.** To restore an object, see **Restoring an Object**.
acl	Optional (additional parameter)	The predefined access control policy of an object. Possible values are: • private • public-read • public-read-write • bucket-owner-full-control

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Parameter	Optional or Mandatory	Description
aclXml	Optional (additional parameter)	The bucket's access control policy, in XML format. The format is as follows: <AccessControlPolicy> <Owner> <ID>*ownerid*</ID> </Owner> <AccessControlList> <Grant> <Grantee> <ID>*userid*</ID> </Grantee> <Permission>*[WRITE|WRITE_ACP|READ|READ_ACP|FULL_CONTROL]*</Permission> </Grant> <Grant> <Grantee> <Canned>Everyone</Canned> </Grantee> <Permission>*[WRITE|WRITE_ACP|READ|READ_ACP|FULL_CONTROL]*</Permission> </Grant> </AccessControlList> </AccessControlPolicy> • **Owner**: Optional. Specify the object owner's ID. • In **AccessControlList**, the **Grant** field contains the authorized users. **Grantee** specifies the IDs of authorized users. **Canned** specifies the authorized user group (currently, only **Everyone** is supported). • The following permissions can be granted: – **WRITE**: the write permission – **WRITE_ACP**: the write permission for the ACL – **READ**: the read permission – **READ_ACP**: the read permission for the ACL – **FULL_CONTROL**: the full control permission **Because angle brackets (<) and (>) are unavoidably included in the parameter value, you must use quotation marks to enclose them for escaping when running the command.** Use single quotation marks for Linux or macOS and double quotation marks for Windows.

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Parameter	Optional or Mandatory	Description
fs	Optional (additional parameter)	Whether the method of listing parallel file systems is applied. If you are listing parallel file systems, you are recommended to add this parameter. • After this parameter is enabled, **marker** and **limit** will be ignored. Then, the size of the bucket, parallel file system, or directory will be calculated. • This parameter is only supported by obsutil 5.5.12 and later. • With this method, the listing time required varies largely depending on the directory structures.
versionId	Optional when setting properties of an object (additional parameter)	The version ID of the object whose properties are to be set
fr	Optional when setting properties of an object (additional parameter)	Generates an operation result file when setting properties of an object.
f	Optional when setting properties of objects in batches (additional parameter)	Runs in force mode.
r	Mandatory when setting properties of objects in batches (additional parameter)	Sets properties of objects in batches based on a specified object name prefix.
v	Optional when setting properties of objects in batches (additional parameter)	Sets properties of versions of objects in batches based on a specified object name prefix.

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Parameter	Optional or Mandatory	Description
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (including success and failure files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. • A result file should be named as follows: **cp_{succeed | failed | warning}_report**_*time*_*TaskId*.**txt**. • By default, the maximum size of a single result file is 30 MB. You can set the maximum size by configuring **recordMaxLogSize** in the configuration file. • By default, the maximum number of result files that can be retained is 1,024. You can set the maximum number by configuring **recordBackups** in the configuration file. • If there are multiple folders and files and you need to confirm the details of a failed task, refer to the failure result file **cp_failed_report**_*time*_*TaskId*.**txt** in the result folder and the **log files** in the log path.
j	Optional when setting properties of objects in batches (additional parameter)	The maximum number of concurrent tasks for setting object properties in batches. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK

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Parameter	Optional or Mandatory	Description
t	Optional (additional parameter)	The user's security token

NOTE

Only one from **acl**, **sc**, or **aclXml** can be set for each command.

Response

Field	Description
Parallel	The parameter **-p** in the request
Jobs	The parameter **-j** in the request
Threshold	The parameter **-threshold** in the request
PartSize	The parameter **-ps** in the request
Exclude	The parameter **-exclude** in the request
Include	The parameter **-include** in the request
TimeRange	The parameter **-timeRange** in the request
VerifyLength	The parameter **-vlength** in the request
VerifyMd5	The parameter **-vmd5** in the request
CheckpointDir	The parameter **-cpd** in the request
OutputDir	The parameter **-o** in the request
ArcDir	The parameter **-arcDir** in the request
Succeed count	The number of successful tasks
Failed count	The number of failed tasks
Skip count	The number of tasks that are skipped during incremental upload, download, or copy, and synchronous upload, download, or copy. **NOTE** Skipped tasks are recorded into successful tasks.

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Field	Description
Warning count	The number of tasks that are executed successfully but contain warnings. **NOTE** • The task for which a warning is generated may be a failure or a success, which needs to be further determined according to the corresponding result list. • The number of tasks that generate warnings is independent of the number of successful or failed tasks. The total number of tasks is the number of successful tasks plus the number of failed tasks.
Succeed bytes	The number of bytes that are successfully uploaded or downloaded.
max cost	The maximum duration of all tasks, in ms
min cost	The minimum duration of all tasks, in ms
average cost	The average duration of all tasks, in ms
average tps	The average number of tasks completed per second
Task id	The unique ID of an operation, which is used to search for the result file generated for a batch task

Ways to View Object Metadata

You can use **OBS Console**, APIs, SDKs, or obsutil to view the metadata of an object.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Click the required object name to go to the object details page.

Step 4 On the **Metadata** tab, view the object metadata.

----End

Using APIs

Querying Object Metadata

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

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Using the CLI Tool - obsutil

Command Line Structure

- In Windows
  ```
  obsutil stat obs://bucket/key [-acl][-bf=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
  ```
- In Linux or macOS
  ```
  ./obsutil stat obs://bucket/key [-acl][-bf=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
  ```

Examples

- Take the Windows OS as an example. Run the **obsutil stat obs://bucket-test/key** command to query the basic properties of an object.
  ```
  obsutil stat obs://bucket-test/key

  Start at 2024-09-25 04:48:10.1147483 +0000 UTC

  Key:
    obs://bucket-test/key
  LastModified:
    2018-11-16T02:15:49Z
  Size:
    7
  StorageClass:
    standard
  ETag:
    43d93b553855b0e1fc67e31c28c07b65
  ContentType:
    text/plain
  Type:
    file
  Metadata:
    key=value
  ```

Parameter Description

Parameter	Optional or Mandatory	Description
bucket	Mandatory	The name of the bucket to which an object belongs
key	Mandatory	The name of the object whose attributes are to be queried
acl	Optional	Queries the access control policies of the object at the same time.

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Parameter	Optional or Mandatory	Description
bf	Optional (additional parameter)	The display format of the object size (in bytes). Possible values are: • **human-readable**: The object size is displayed in a human-readable format. For example, the object size is displayed in KB, MB, GB, or TB (for instance, 1 GB), rather than in bytes (for instance, 1,073,741,824 bytes, which is a very large number). • **raw**: The number of bytes is displayed without any conversion or formatting. For example, if the space occupied by an object is 1 GB, the object size is displayed as 1,073,741,824 bytes. For common users, the **human-readable** format is easier to understand. For scenarios where accurate calculation or automatic processing is required, the **raw** format is more suitable. If this parameter is not configured, the display format of the object size (in bytes) is determined by the **humanReadableFormat** parameter in the configuration file.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Response

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Field	Description
Key	The object name
LastModified	The latest modification time of the object
Size	The object size Unit: byte
StorageClass	The storage class of the object Possible values are: • **standard**: Standard storage class. It features low access latency and high throughput, and is applicable to storing frequently accessed data (multiple accesses per month) or data that is smaller than 1 MB. • **warm**: Infrequent Access storage class. It is ideal for storing infrequently accessed (less than 12 times a year) data, but when needed, the access has to be fast. • **cold**: Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once a year) data. **For an object whose storage class is cold, restore the object first and then specify its storage class.** • **deep-archive**: Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely (once every few years) accessed. This storage class costs less than the Archive storage class, but takes longer time (usually several hours) to restore data.
MD5	Real MD5 of the object. This parameter is used to ensure and verify data integrity. You can query this value only after running the **cp** command and configuring the **-vmd5** parameter.
ETag	The ETag value of an object calculated on the server
ContentType	The file type of an object. It determines the format and encoding method a browser will use to read the file. For details about common **ContentType** values, see **Content-Type Introduction**.
Type	The file type
Metadata	The user-defined metadata of the object. This field can be queried only when the object has user-defined metadata. For details about user-defined object metadata, see **User-defined Object Metadata**.

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4.6.4 Sharing an Object

Scenarios

You can share temporary URLs of your objects with others for them to access your objects stored in OBS.

Background Information

You can share files with other users temporarily or permanently.

- Temporary sharing:

  Share a file to other users through the temporary URL of the file. File sharing is temporary. All sharing URLs are only valid for a limited period of time.

  A temporary URL consists of the access domain name and the temporary authentication information of a file. Example:

  ```
  https://bucketname.obs.ap-southeast-1.myhuaweicloud.com:443/image.png?
  AccessKeyId=xxx&Expires=xxx&x-obs-security-token=xxx&Signature=xxx
  ```

  The temporary authentication information contains the **AccessKeyId**, **Expires**, **x-obs-security-token**, and **Signature** parameters. **AccessKeyId**, **x-obs-security-token**, and **Signature** are used for authentication. The **Expires** parameter specifies the validity period of the authentication.

  For details about the temporary authentication method and parameters, see **Authentication of Signature in a URL** in the *Object Storage Service API Reference*.

- Permanent sharing:

  If you set the permission for an object to allow anonymous users to read it, anonymous users can access the object through the URL that you shared. For details about how to configure permissions, see **Granting Public Read Permissions on Objects to Anonymous Users**.

  The method of using a browser to access objects varies depending on the object type. You can directly open **.txt** and **.html** files using a browser. However, when you open **.exe** and **.dat** files using a browser, the files are automatically downloaded to your local computer.

  For details about how to obtain the object access URL, see **How Do I Obtain the Access Path to an Object?**

  If access to an object using the URL fails, fix the problem by referring to **Why Can't I Access an Object Through Its URL?**

Constraints

- An authorization code is not required for temporarily sharing a file. Temporarily sharing a folder requires an authorization code when the method of sharing by access code is used. For details, see **Sharing a Folder**.
- The following table describes the URL validity period of the files that are temporarily shared in different ways.

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Way	URL Validity Period
OBS Console	The URL is valid for 1 minute to 18 hours. After an object is shared, the system will generate a URL that contains the temporary authentication information, valid for five minutes since its generation by default. Each time you change the validity period of a URL, OBS obtains the authentication information again to create a new shared URL. This new URL is in effect immediately upon the change. If you need a longer validity period, you can use OBS Browser+ to set a validity period of up to one year. If you want a shared object to be permanently valid, **use a bucket policy to grant anonymous users the read-only permission for the object**.
SDKs	Configure parameter **Expires** to specify when a temporary authorization expires. The temporary authorization expires in 20 years in maximum.
APIs	Configure parameter **Expires** to specify when a temporary authorization expires. The temporary authorization expires in 20 years in maximum.
OBS Browser+	When you log in to OBS Browser+ using an account and password, a shared URL can be valid for 24 hours at most. The default validity period is 10 hours. If a longer validity period is required, use the permanent AK/SK for login.
obsutil	Use the additional parameter **e** to specify when an object download URL expires. The minimum value is 60s and the default one is 300s. There is no upper limit on the expiration time.

- Only buckets whose version is 3.0 support object sharing. For details about how to query the bucket version, see **Checking OBS Version (OBS 2.0 or OBS 3.0)**.
- Archive objects can be shared only after they have been restored.
- Deep Archive objects can be shared only after they have been restored.
- Object sharing is currently available only in some regions.

Ways to Share an Object

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to share objects.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Select the file to be shared and click **Share** in the **Operation** column.

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Step 4 In the **Share File** dialog box, configure parameters.

Figure 4-11 Sharing a file

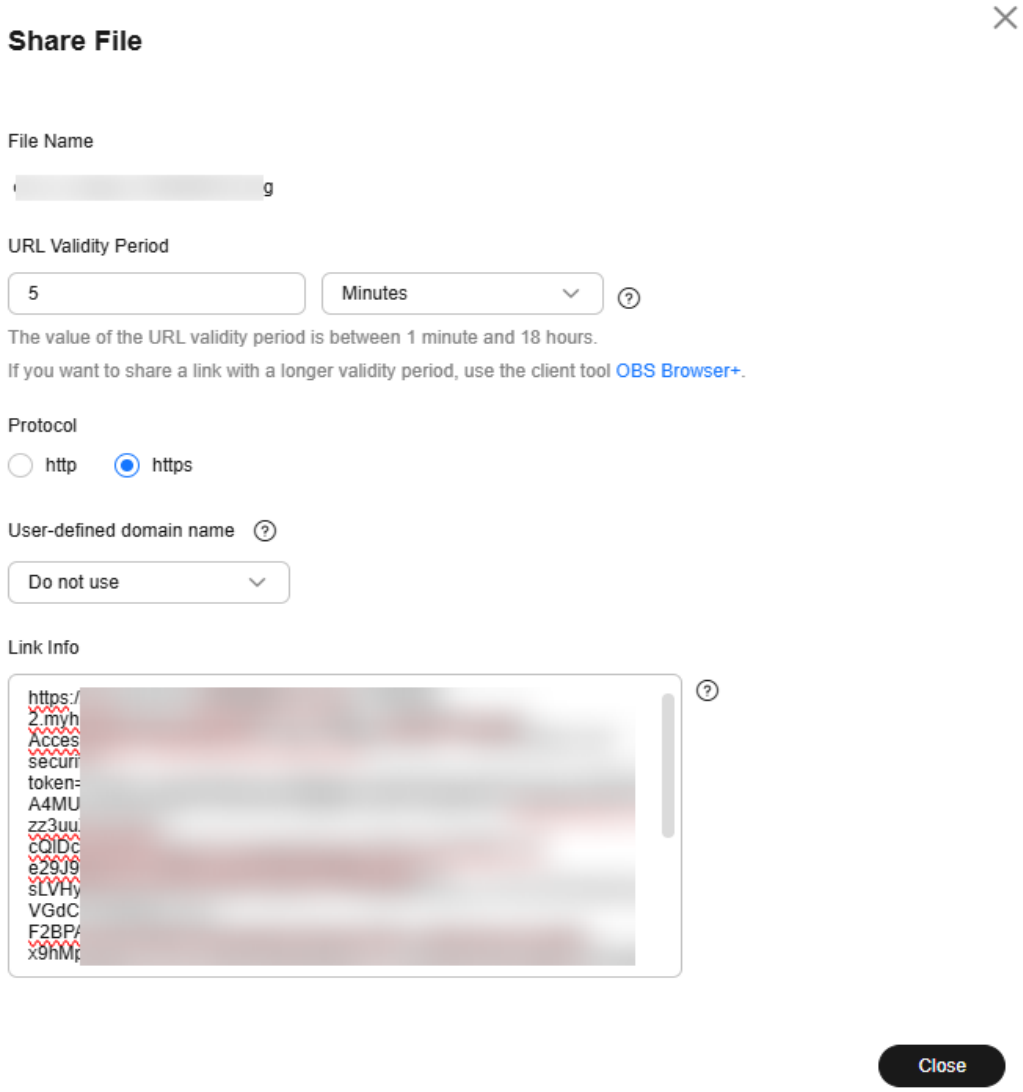

Table 4-6 Parameters for sharing a file

Parameter	Description
URL Validity Period	After the specified amount of time, the URL will expire. • A shared URL can remain valid between one minute and 18 hours. During that time, anyone can use the shared URL to access the object. To share a link with a longer validity period, you can use **OBS Browser+**. • The moment the **Share File** dialog box is opened, the link is in effect and valid for five minutes by default. Each time you change the URL validity period, the link takes effect again and changes accordingly. You need to re-share the link.

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Parameter	Description
Protocol	The protocol of the shared link The protocol defaults to **https**. • **http**: It is for scenarios where security is not a major concern. • **https**: It is for scenarios where security is a major concern. HTTPS uses SSL or TLS to secure data transmission, which ensures data confidentiality and integrity. It also verifies the server's identity through certificates to prevent attacks.
User-defined domain name	Whether a user-defined domain name is used in the shared link • **Do not use**: The bucket's default domain name is used in the shared link. • You can choose a user-defined domain name, which will be part of the shared link. **NOTE** To protect your services from being affected by the takeover of Huawei Cloud public domain names by relevant organizations, you are advised to use a user-defined domain name to access a bucket. – CDN accelerates access over the Internet (anyone can access CDN). If CDN acceleration is enabled for a user-defined domain name, the shared link containing that domain name may never expire. This means that anyone can access the shared object at any time.

Step 5 Share the object.

- Click **Open in Browser** to preview the object on a new page or directly download it to your default download path.
- Click **Copy Link** to share the link to others for them to access this object using a browser.
- Click **Copy Path** and share the path with users who have access to the bucket that stores the shared object. Then, they can go to the object list of the bucket and paste the shared path in the object search box and press **Enter** to search for or access the object.

----End

Using APIs

Authentication of Signature in a URL

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Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Locate the object you want to share and click next to the object. The window shown in **Figure 4-12** or **Figure 4-13** is displayed.

Figure 4-12 Sharing a file

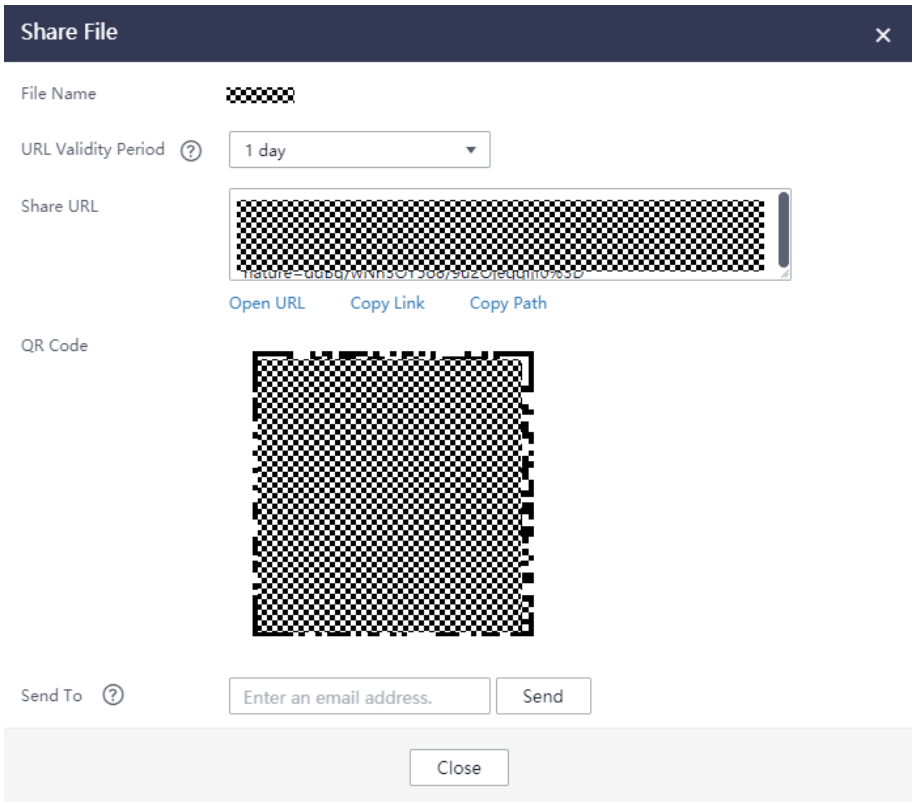

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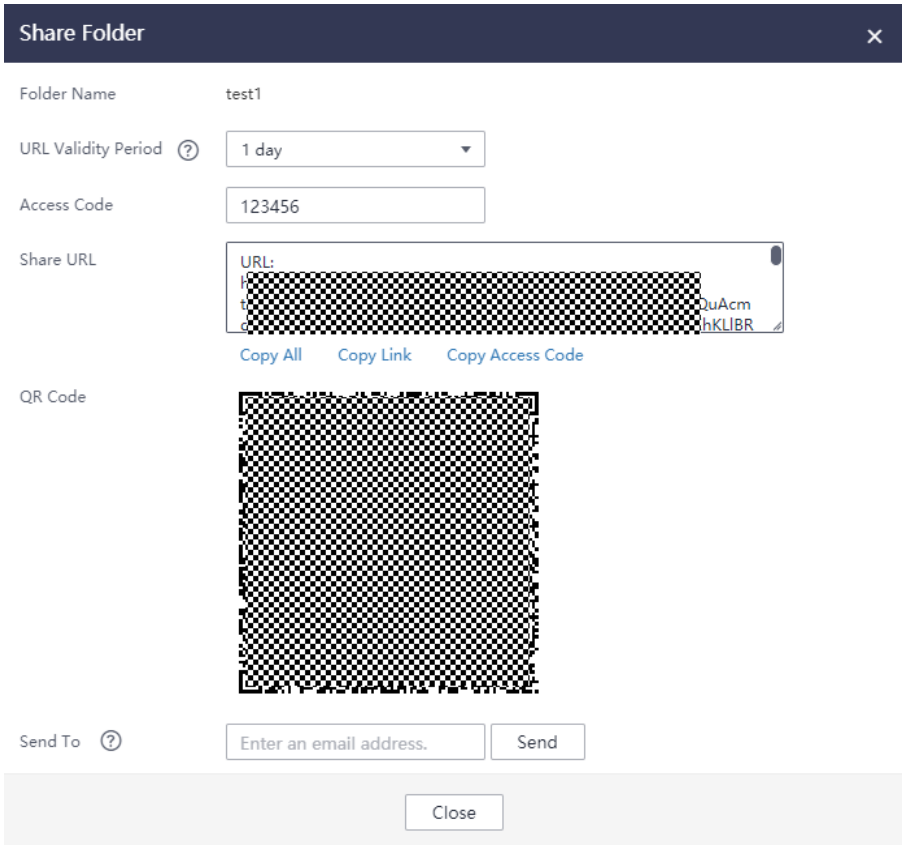
Figure 4-13 Sharing a folder



Step 3 Click **Copy Link** to copy the object link to a browser and open it. Then you can access the object.

NOTE

To allow anonymous users to access Archive objects using URLs, ensure that these objects are in the **Restored** state.

----End

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
  - Generating the download link of a single object
    ```
    obsutil sign obs://bucket/key [-e=300] [-config=xxx] [-endpoint=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Generating the download links of objects in batches by object name prefix
    ```
    obsutil sign obs://bucket[/key] -r [-e=300] [-timeRange=time1-time2] [-include=*.xxx] [-exclude=*.xxx] [-o=xxx] [-config=xxx] [-endpoint=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
- In Linux or macOS
  - Generating the download link of a single object
    ```
    ./obsutil sign obs://bucket/key [-e=300] [-config=xxx] [-endpoint=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Generating the download links of objects in batches by object name prefix

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```
./obsutil sign obs://bucket[/key] -r [-e=300] [-timeRange=time1-time2] [-include=*.xxx] [-exclude=*.xxx] [-o=xxx] [-config=xxx] [-endpoint=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

Examples

- In Windows, run **obsutil sign obs://bucket-test/test.txt** to generate a single object download link:

```
obsutil sign obs://bucket-test/test.txt

Download url of [obs://bucket-test/test.txt] is:
  http://your-endpoint/bucket-test/test.txt?AccessKeyId=xxxx&Expires=1552548758&Signature=xxxx
```

- In Windows, run **obsutil sign obs://bucket-test/test/ -r** to generate object download links in batches:

```
obsutil sign obs://bucket-test/test/ -r

Generate download urls for objects .

Generate the download url(s) for the objects in the bucket [bucket-test] finished
Task id: af4dc692-6a88-4541-8156-ff1a889d2288
```

NOTE

- If there are a large number of objects, obsutil saves the object download links to a specific file. The file name is associated with the task ID. For instance, the task ID in the example above is **af4dc692-6a88-4541-8156-ff1a889d2288**, so the file name should be **sign_succeed_report_{***timestamp***}_af4dc692-6a88-4541-8156-ff1a889d2288.txt**.
- By default, the file is stored under folder **.obsutil_output** in your user directory. You can also use parameter **-o** to specify a new folder.

Parameter Description

Parameter	Optional or Mandatory	Description
bucket	Mandatory	The bucket name
key	Optional	The object name used for generating the download link of a single object, or object name prefix used for generating download links of objects in batches
e	Optional (additional parameter)	The validity period of the generated download links of objects, in seconds. Minimum value: 60s. Default value: 300s
r	Mandatory when generating download links of objects in batches (additional parameter)	Generates the download links of objects in batches by a specified object name prefix.

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Parameter	Optional or Mandatory	Description
exclude	Optional when generating download links of objects in batches (additional parameter)	The matching patterns of objects that are excluded, for example: ***.txt** **NOTE** • The asterisk (*) represents any group of characters, and the question mark (?) represents any single character. For instance, **abc*.txt** indicates any file whose name starts with **abc** and ends with **.txt**. • You can use ***** to represent ***** and **\?** to represent **?**. • If the name of the object to be downloaded matches the value of this parameter, the object is skipped. **NOTICE** • You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. • The matching pattern applies to the absolute path of an object, including the object name prefix and object name starting from the root directory. For example, if the path of an object in the bucket is **obs://bucket/src1/src2/test.txt**, then the absolute path of the object is **src1/src2/test.txt**. • This matching pattern applies only to objects whose names do not end with a slash (/). • Multiple **exclude** parameters can be specified, for example, **-exclude=*.xxx -exclude=*.xxx**.

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Parameter	Optional or Mandatory	Description
include	Optional when generating download links of objects in batches (additional parameter)	The matching patterns of objects that are included, for example: ***.jpg** **NOTE** • The asterisk (*) represents any group of characters, and the question mark (?) represents any single character. • You can use ***** to represent ***** and **\?** to represent **?**. • Only after identifying that the name of the file to be downloaded does not match the value of **exclude**, the system checks whether the file name matches the value of this parameter. If yes, the file is downloaded. If not, the file is skipped. **NOTICE** • You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. • The matching pattern applies to the absolute path of an object, including the object name prefix and object name starting from the root directory. For example, if the path of an object in the bucket is **obs://bucket/src1/src2/test.txt**, then the absolute path of the object is **src1/src2/test.txt**. • This matching pattern applies only to objects whose names do not end with a slash (/). • Multiple **include** parameters can be specified, for example, **-include=*.xxx -include=*.xxx**.
timeRange	Optional (additional parameter)	The time range matching pattern when generating download links of objects. Only the download links of objects whose latest modification time is within the configured time range are generated. This pattern has a lower priority than the object matching patterns (**exclude**/**include**). That is, the time range matching pattern is executed after the configured object matching patterns. **NOTE** • Time in the matching pattern is the UTC time. • This matching pattern applies only to objects whose names do not end with a slash (/). • The matching time range is represented in *time1*-*time2*, where *time1* must be earlier than or the same as *time2*. The time format is *yyyyMMddHHmmss*. • Automatic formatting is supported. For example, yyyyMMdd is equivalent to yyyyMMdd000000, and yyyyMM is equivalent to yyyyMM01000000. • If this parameter is set to ***-***time2***, all files whose latest modification time is earlier than *time2* are matched. If it is set to *time1*-***, all files whose latest modification time is later than *time1* are matched.

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Parameter	Optional or Mandatory	Description
o	Optional when generating download links of objects in batches (additional parameter)	The folder that stores the result files. After the command is executed, result files (possibly success and failure files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. **NOTE** • A result file should be named as follows: **sign_{succeed | failed}_report_*time*_TaskId.txt**. By default, the maximum size of a single result file is 30 MB and the maximum number of result files that can be retained is 1,024. You can set the maximum size and number by configuring **recordMaxLogSize** and **recordBackups** in the configuration file.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
endpoint	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

4.6.5 Sharing Objects with Anonymous Users Using URLs

You can grant anonymous users the read permission for an object so they can access the object using the shared object URL.

Prerequisites

Anonymous users have the read permission for the object.

For details about permission granting, see **Granting All Accounts the Read Permission for Certain Objects**.

NOTE

Encrypted objects cannot be shared.

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Procedure

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Click the object to be shared. The basic information about the object is displayed on the **Basic Information** tab. On the top part of the page, you can find the object's sharing link in the **Link** area.

Anonymous users can access the object by clicking this link. An object link (URL) is in the format of **https://***Bucket name.Domain name/Directory level/Object name*. If the object is stored in the root directory of the bucket, its URL does not contain any directory level. To learn more about domain names, see **OBS Domain Names**.

Figure 4-14 Object link

NOTE

- To allow anonymous users to access objects in Archive or Deep Archive storage using URLs, ensure that these objects are in the **Restored** state.

----End

4.6.6 Restoring Archive or Deep Archive Objects

Scenarios

You must restore an object in the Archive or Deep Archive storage class before you can download it or access it with a URL.

To learn the costs involved in data restore, see **Product Pricing Details**.

Important Notes

- After an object is restored, an object copy in the Standard storage class will be generated. This way, there is an Archive or a Deep Archive object and a Standard object copy in the bucket at the same time. After an Archive or Deep Archive object is restored, the object status displays **Restored**, and the generated object copy in Standard storage class is not displayed in the bucket.
- After versioning is enabled, if you do not specify a version ID, OBS restores the current version. You can specify a version ID to restore a specific version.
- If the RestoreObject API is called for the first time, 202 will be returned, indicating that the server has received the request. If the RestoreObject API is called again after a successful object restore, 200 OK will be returned.

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Constraints

- Archive and Deep Archive objects can remain in a restored state **for a maximum of 30 days**.
- If an Archive or a Deep Archive object is being restored, its restore speed cannot be changed, and the restore task cannot be suspended or deleted.
- If you attempt to restore an object that **is being restored**, error 409 will be reported. Wait **for the current restore to finish** before trying again.
- Objects that are **being restored** cannot be added to a batch restore.

Object Restore Option and Time Required

OBS provides the following restore options.

To restore a large number of objects from the Deep Archive storage class, you are advised to use the standard restore. The restore time spent depends on the object size restored.

Storage Class	Restore Option	Time Required
Archive	Expedited	1 to 5 minutes
Archive	Standard	3 to 5 hours
Deep Archive	Expedited	3 to 5 hours
Deep Archive	Standard	5 to 12 hours

How Object Restore Works

Object Restore Process

Archive and Deep Archive objects have the same restore process. The following gives an example:

1. Before a restore, an object is in the unrestored state.
2. On July 1, you submit the first restore request. The object enters the restoring state.
3. On July 1, the server completes the restore operation. The object enters the restored state and becomes readable. Assume that you set the validity period to 10 days this time. The object will remain in the restored state until July 10.
4. On July 5, you make another restore request for the object and set the validity period to 10 days. The object will then remain in the restored state until July 15, with a total validity period of 15 days.
5. Once the validity period is reached, the object returns to the unrestored state and is stored in its original storage class.

Cumulative Validity Period Rule

If you initiate a restore request for an object at time **A** and set the validity period to **N** days, the restore expiration time will be **A + N**. Later, you make another

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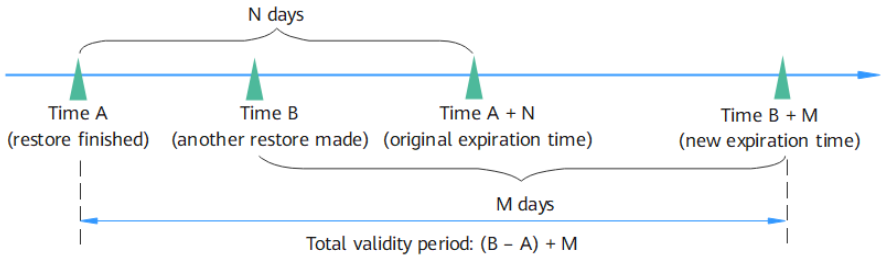
restore request for the object at time **B** (**B** is earlier than **A + N**) and set the validity period to **M** days:

- If **B + M** is later than **A + N**, the expiration time changes to **B + M**, and the total validity period is **(B – A) + M**, as shown in **Figure 4-15**.

Figure 4-15 Cumulative validity period rule



- If **B + M** is earlier than **A + N**, the second restore will fail.

Prerequisites

You have the obs:object:RestoreObject permission. For details, see **Granting Permissions to an IAM User Under the Current Account**.

Ways to Restore Objects

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to restore Archive or Deep Archive objects.

Using OBS Console

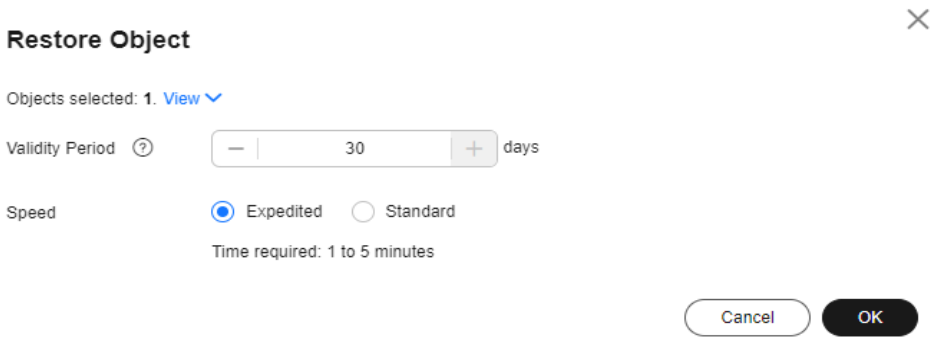
Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Select the file you want to restore, and click **Restore** in the **Operation** column.

You can select multiple files and choose **More** > **Restore** above the file list to batch restore them.

Figure 4-16 Restore Object



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Step 4 Configure the validity period and speed of the restore.

Table 4-7 Parameters for restoring objects

Parameter	Description
Validity Period	The number of days that the object will remain in the **Restored** state. It starts once the object is restored. The value is an integer from 1 to 30 (days). The default value is **30**. For example, if you set **Validity Period** to **20**, 20 days after the object is successfully restored, its status will change from **Restored** to **Unrestored**.
Speed	The time required for restoring an object. • **Expedited**: Archive objects can be restored within 1 to 5 minutes, and Deep Archive objects can be restored within 3 to 5 hours. • **Standard**: Archive objects can be restored within 3 to 5 hours, and Deep Archive objects can be restored within 5 to 12 hours.

Step 5 Click **OK**.

NOTE

The system checks the file restore status at UTC 00:00 every day. The system starts counting down the expiration time from the time when the latest check is complete.

----End

Using APIs

Restoring Archive or Deep Archive Objects

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Go to the object list in the target bucket.

Step 3 Select the file or folder you want to restore and choose **More** > **Restore Object**. The window shown in **Figure 4-17** is displayed.

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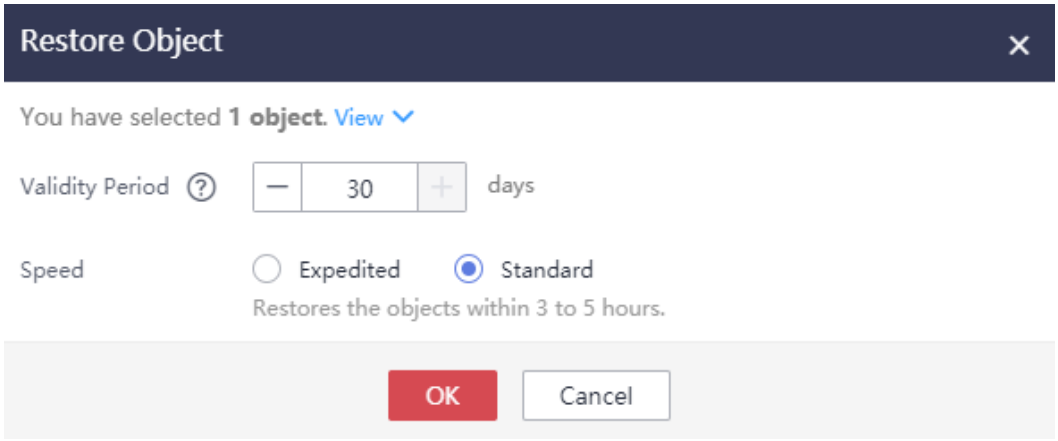
Figure 4-17 Restoring an object



To restore an object, you must configure the validity period and restore speed. Table 4-8 describes relevant parameters.

Table 4-8 Restoring an object

Parameter	Description
Object Name	Name of the object or path to be restored.
Validity Period	Time duration when an object remains in the **Restored** state after it has been restored. The validity period starts when the object is restored. You can set the validity period to an integer ranging from 1 to 30 (days). The default value is **30**. For example, you set **Validity Period** to **20** when restoring an object. 20 days after the object is restored, its status will change from **Restored** to **Unrestored**.
Speed	How fast an object will be restored. • **Expedited**: Data smaller than 250 MB can be restored within 1 to 5 minutes. • **Standard**: All Archive data can be restored within 3 to 5 hours.

Step 4 Click **OK** to confirm the restored file or folder.

To view the restoration status of the file or folder, click ··· next to the object and choose **Object Properties** to view the restoration status. You can download the file only after it has been restored.

----End

Using the CLI Tool - obsutil

Command Line Structure

- In Windows

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  - Restoring an object
    ```
    obsutil restore obs://bucket/key [-d=1] [-t=xxx] [-versionId=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-token=xxx]
    ```
  - Restoring objects in batches
    ```
    obsutil restore obs://bucket[/key] -r [-f] [-v] [-d=1] [-t=xxx] [-o=xxx] [-j=1] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-token=xxx]
    ```
  - Restoring all objects in a specific directory at a time
    ```
    obsutil restore obs://bucket/folder/ -r [-f] [-v] [-d=1] [-t=xxx] [-o=xxx] [-j=1] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-token=xxx]
    ```

- In Linux or macOS
  - Restoring an object
    ```
    ./obsutil restore obs://bucket/key [-d=1] [-t=xxx] [-versionId=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-token=xxx]
    ```
  - Restoring objects in batches
    ```
    ./obsutil restore obs://bucket[/key] -r [-f] [-v] [-d=1] [-t=xxx] [-o=xxx] [-j=1] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-token=xxx]
    ```
  - Restoring all objects in a specific directory at a time
    ```
    ./obsutil restore obs://bucket/folder/ -r [-f] [-v] [-d=1] [-t=xxx] [-o=xxx] [-j=1] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-token=xxx]
    ```

Examples

- Take the Windows OS as an example. Run the **obsutil restore obs://bucket-test/key** command to restore a single object whose storage class is **cold**.
  ```
  obsutil restore obs://bucket-test/key
  Start at 2024-09-30 08:56:17.9537365 +0000 UTC

  Start to restore object [key] in the bucket [bucket-test] successfully, cost [252] ms, request id [0000019242250F754015F23EE0B7876E]
  ```
- Take the Windows OS as an example. Run the **obsutil restore obs://bucket-test -r -f** command to restore objects whose storage class is **cold** in the bucket in batches.
  ```
  obsutil restore obs://bucket-test -r -f
  Start at 2024-09-30 08:57:11.3565648 +0000 UTC

  [=============================================] 100.00% 3s
  Succeed count:  12      Failed count:   0
  Metrics [max cost:264 ms, min cost:54 ms, average cost:119.33 ms, average tps:19.70]
  Task id: 96f104ee-d0bf-40ff-95dd-31dec0d8f4f4
  ```

Parameter Description

Parameter	Optional or Mandatory	Description
bucket	Mandatory	The bucket name
key	Mandatory for restoring a single object whose storage class is **cold** Optional for batch restoring objects whose storage class is **cold**	The name of the object to be restored or the name prefix of the objects to be restored in batches **NOTE** If this parameter is left blank when batch restoring objects, all objects whose storage class is **cold** in the bucket are restored.

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Parameter	Optional or Mandatory	Description
d	Optional (additional parameter)	The storage duration after objects whose storage class is **cold** are restored, in days. The value ranges from 1 to 30. The default value is **1**.
t	Optional (additional parameter)	The options for restoring objects. Possible values are: • standard • expedited **NOTE** • **expedited** indicates that objects can be quickly restored from Archive storage within 1 to 5 minutes and from Deep Archive storage (under limited beta testing) within 3 to 5 hours. • **standard** indicates that objects can be restored from Archive storage within 3 to 5 hours and from Deep Archive storage (under limited beta testing) within 5 to 12 hours. • If this parameter is not configured, an expedited restore is used by default.
versionId	Optional for restoring a single object whose storage class is **cold** (additional parameter)	The version ID of the to-be-restored object whose storage class is **cold**
fs	Optional (additional parameter)	Whether the method of listing parallel file systems is applied. If you are listing parallel file systems, you are recommended to add this parameter. **CAUTION** • With this method, the listing time required varies largely depending on the directory structures. • After this parameter is enabled, **marker** and **limit** will be ignored. Then, the size of the bucket, parallel file system, or directory will be calculated. • This parameter is only supported by obsutil 5.5.12 and later.
fr	Optional for restoring a single object whose storage class is **cold** (additional parameter)	Generates an operation result file when restoring a single object whose storage class is **cold**.

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Parameter	Optional or Mandatory	Description
f	Optional for batch restoring objects whose storage class is **cold** (additional parameter)	Runs in force mode.
r	Mandatory for batch restoring objects whose storage class is **cold** (additional parameter)	Restores objects whose storage class is **cold** in batches by object name prefix.
v	Optional for batch restoring objects whose storage class is **cold** (additional parameter)	Restores versions of objects whose storage class is **cold** in batches by object name prefix.
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (possibly success and failure files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. **NOTE** • A result file should be named as follows: **restore_{succeed | failed}_report**_*time_TaskId*.**txt**. By default, the maximum size of a single result file is 30 MB and the maximum number of result files that can be retained is 1,024. You can set the maximum size and number by configuring **recordMaxLogSize** and **recordBackups** in the configuration file.
j	Optional for batch restoring objects whose storage class is **cold** (additional parameter)	The maximum number of concurrent tasks for batch restoring objects whose storage class is **cold**. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.

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Parameter	Optional or Mandatory	Description
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
token	Optional (additional parameter)	The user's security token

Response

Field	Description
Parallel	The parameter **-p** in the request
Jobs	The parameter **-j** in the request
Threshold	The parameter **-threshold** in the request
PartSize	The parameter **-ps** in the request
Exclude	The parameter **-exclude** in the request
Include	The parameter **-include** in the request
TimeRange	The parameter **-timeRange** in the request
VerifyLength	The parameter **-vlength** in the request
VerifyMd5	The parameter **-vmd5** in the request
CheckpointDir	The parameter **-cpd** in the request
OutputDir	The parameter **-o** in the request
ArcDir	The parameter **-arcDir** in the request
Succeed count	The number of successful tasks
Failed count	The number of failed tasks
Skip count	The number of tasks that are skipped during incremental upload, download, or copy, and synchronous upload, download, or copy. **NOTE** Skipped tasks are recorded into successful tasks.

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Field	Description
Warning count	The number of tasks that are executed successfully but contain warnings. **NOTE** • The task for which a warning is generated may be a failure or a success, which needs to be further determined according to the corresponding result list. • The number of tasks that generate warnings is independent of the number of successful or failed tasks. The total number of tasks is the number of successful tasks plus the number of failed tasks.
Succeed bytes	The number of bytes that are successfully uploaded or downloaded.
max cost	The maximum duration of all tasks, in ms
min cost	The minimum duration of all tasks, in ms
average cost	The average duration of all tasks, in ms
average tps	The average number of tasks completed per second
Task id	The unique ID of an operation, which is used to search for the result file generated for a batch task

4.6.7 Direct Reading

Scenarios

You can enable direct reading if you want to obtain Archive objects immediately or if there are interface compatibility issues when OBS is interconnected with other systems.

With direct reading enabled for a bucket, you can access objects in the Archive storage class without restoring them first. However, downloading or copying Archive objects will incur costs for directly reading these objects. For details, see **Product Pricing Details**.

This section describes how to enable direct reading for Direct Reading objects in a created bucket. If you want to enable Direct Reading when creating a bucket, see **Creating a Bucket**.

Object Retrieval Comparison Before and After Direct Reading Is Enabled

Item	Direct Reading Disabled (Default)	Direct Reading Enabled
Retrieval method	Objects are restored and then read.	Objects are directly read.
Retrieval cost	Low	High

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Item	Direct Reading Disabled (Default)	Direct Reading Enabled
Retrieval time	Minutes	Milliseconds

Billing

Table 4-9 Billing for direct reading

Action	Billing Item	Description	Billing Mode
Direct reading	Requests	You are billed for the number of successfully read objects. If *N* objects are successfully read, you are billed for *N* requests.	Pay-per-use
	Direct reading traffic	Traffic for downloading and replicating Archive objects from a bucket with direct reading enabled. For more information, see **Direct Reading**. The amount of data retrieved is determined by **the range specified in the request header when the HTTP connection is established**. Even if the transmission is interrupted early, the system calculates usage based on the full range defined in the original request. For example, if the request specifies a range from 50 MB to 100 MB, the system still bills you for the range of 50 MB to 100 MB, even if only one byte is actually transmitted.	Pay-per-use
	Outbound Internet traffic (when objects are accessed over the Internet)	If you download or replicate objects over the Internet, the outbound Internet traffic costs will be incurred based on the object size.	Pay-per-use Resource packages (outbound Internet traffic)

Example: **Billing for downloading objects from a bucket with or without direct reading enabled**

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Assume that you need to download 100 Archive objects (100 GB in total) over the Internet. The following table compares the billing for downloading these objects from a bucket with or without direct reading enabled.

Table 4-10 Billing for downloading objects from a bucket with or without direct reading enabled

Billing Item	A Bucket Without Direct Reading Enabled	A Bucket With Direct Reading Enabled
Restore requests	100 PUT requests	N/A
Download requests	100 GET requests	100 GET requests
Temporary storage	Storage for 100 GB of Standard copies, which is charged once	N/A
Restore traffic	Assume that you use expedited restore, there will be traffic for restoring 100 GB of data at an expedited speed.	N/A
Direct reading traffic	N/A	Direct reading traffic for 100 GB of data
Outbound Internet traffic	Outbound Internet traffic for 100 GB of data	Outbound Internet traffic for 100 GB of data

Ways to Configure Direct Reading

You can use **OBS Console** or APIs to configure direct reading.

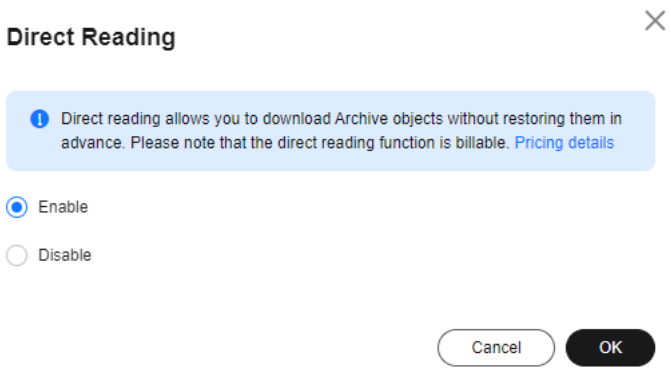
Using OBS Console

Step 1 In the navigation pane, choose **Overview**.

Step 2 In the **Basic Configurations** area, click **Direct Reading**. The **Direct Reading** dialog box is displayed.

Step 3 Select **Enable**.

Figure 4-18 Enabling direct reading



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Step 4 Click **OK**.

----End

Using APIs

Setting the Direct Reading Policy for Archive Objects in a Bucket

4.6.8 Adding Tags to an Object

Tag Rules

OBS offers object tags for you to classify objects in buckets. You can tag an object when you upload it to a bucket or after it is stored in the bucket.

An object tag is a key-value pair. To use tags, follow the rules below:

- An object can have up to 10 tags.
- A tag key:
  - Must be unique if there are multiple tags specified for an object.
  - Can be 36 characters long at most and cannot contain the following special characters: **,/|<>=***. It must be case sensitive and unique and cannot start or end with a space. It cannot be left blank.
- A tag value:

  Can be 255 characters long at most and cannot contain the following special characters: **,/|<>=***. It must be case sensitive and cannot start or end with a space. It can be left blank.

Precautions

- Object tags are now during open beta testing and can be used for free. Once the testing period is over, you will be billed for using them.
- To read or write object tags, you must be the object owner or have required permissions. Such permissions can be granted using bucket policies.
- During cross-region replication, tags of source objects are not copied.
- Tags cannot be added to files in parallel file systems.
- Currently, object tags cannot be used in IAM permissions or bucket policies.

Scenarios

Specifying object tags in a lifecycle rule

In a lifecycle configuration, you can specify filter conditions to identify the objects which the lifecycle rule applies to. A filter can be defined based on an object name prefix, an object tag, or both. For example, you can configure a lifecycle rule to delete objects with prefix **texta/** and tag **key1/value1** or **key2/value2** 120 days after their creation.

```
<LifecycleConfiguration>
   <Rule>
      <ID>sample-rule</ID>
      <Filter>
         <And>
            <Prefix>texta/</Prefix>
```

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```
            <Tag>
               <Key>key1</Key>
               <Value>value1</Value>
            </Tag>
            <Tag>
               <Key>key2</Key>
               <Value>value2</Value>
            </Tag>
         </And>
      </Filter>
      <Status>Enabled</Status>
      <Expiration>
         <Days>120</Days>
      </Expiration>
   </Rule>
</LifecycleConfiguration>
```

Ways to Add Object Tags

You can use **OBS Console** or APIs to add tags to an object.

Using OBS Console

On **OBS Console**, you can add tags to an object when uploading it (see **Using OBS Console**). You can also add tags to an existing object, as described in the following:

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the object list, click the name of the object you want to add tags to.

Step 4 On the object details page, choose **Tags** > **Add Tag**.

Step 5 In the **Add Tag** dialog box, enter a tag key and a tag value.

Table 4-11 Parameters for configuring a tag

Parameter	Description
Tag key	Key of a tag, which must be unique and cannot be left blank. You can customize a tag or choose one predefined on TMS. A tag key: • A tag key: – Must be unique if there are multiple tags specified for an object. – Can be 36 characters long at most and cannot contain the following special characters: **,/|<>=***. It must be case sensitive and unique and cannot start or end with a space. It cannot be left blank.

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Parameter	Description
Tag value	Value of a tag, which can be repetitive or left blank. A tag value: • A tag value: Can be 255 characters long at most and cannot contain the following special characters: **,/|<>=***. It must be case sensitive and cannot start or end with a space. It can be left blank.

Step 6 Click **OK**.

----End

Using APIs

Adding Tags to an Object

Obtaining Object Tags

Deleting Object Tags

Related Operations

In the tag list, click **Edit** to change the tag value or click **Delete** to remove the tag.

4.7 Deleting Objects

4.7.1 Deleting an Object

Scenarios

To save space and reduce costs, you can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to delete unwanted objects.

This section describes how to manually delete files or folders. For details about the comparison between manual and automatic deletion, see **Table 4-12**.

Table 4-12 Object deletion methods

Method	Description	Rule
Manual deletion	Manual deletion is recommended for deleting a few or irregular objects.	• Individual deletion • Batch deletion

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Method	Description	Rule
Automatic deletion	To delete a large number of objects at a time or delete some objects periodically, you can **configure a lifecycle rule**.	

NOTE

In big data scenarios, parallel file systems usually have deep directory levels and each directory has a large number of files. In such case, deleting directories from parallel file systems may time out. To address this problem, you are advised to delete directories in either of the following ways:

1. On the Hadoop client that has OBSA, an OBS client plugin, embedded, run the **hadoop fs - rmr obs://{***Name of a parallel file system***}/{***Directory name***}** command.
2. Configure **a lifecycle rule** for directories so that they can be deleted in background based on the preset lifecycle rule.

Deleting Objects from a Bucket with Versioning Disabled, Suspended, or Enabled

Deleting objects may cause data loss. Exercise caution when performing this operation. Versioning can reduce the risk by restoring objects that are accidentally deleted or overwritten.

Scenario	Deleting the Current Object Version	Deleting a Noncurrent Object Version
A versioning-disabled bucket	OBS permanently deletes objects. Deleted objects cannot be recovered.	N/A

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Scenario	Deleting the Current Object Version	Deleting a Noncurrent Object Version
A versioning-suspended bucket	• If an object's current version does not have a delete marker and its version ID is not null, the object deletion operation turns the current version into a noncurrent version and inserts a delete marker with an ID of null. The delete marker then becomes the current version. • If an object's current version does not have a delete marker and its version ID is null, the object deletion operation inserts a delete marker with an ID of null that overwrites the current version. The delete marker then becomes the current version, and the overwritten version cannot be recovered. • If the current version has a delete marker, no action is taken. **NOTE** • After versioning is suspended, a newly uploaded object will have a version ID of null. If the newly uploaded object has the same name as an existing object with a null version ID, this new object will overwrite the existing object. For more information about versioning, see **Versioning**. • By enabling **Historical Versions** in the object list, you can view the version ID of an object.	Deleted noncurrent versions cannot be recovered.
A versioning-enabled bucket	• If an object's current version does not have a delete marker, the object deletion operation inserts a delete marker. Then, the current version becomes a noncurrent version and the delete marker becomes the current version. • If an object's current version has a delete marker, permanently deleting the current version recovers the object.	Deleted noncurrent versions cannot be recovered.

Ways to Delete Objects

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to delete files or folders.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

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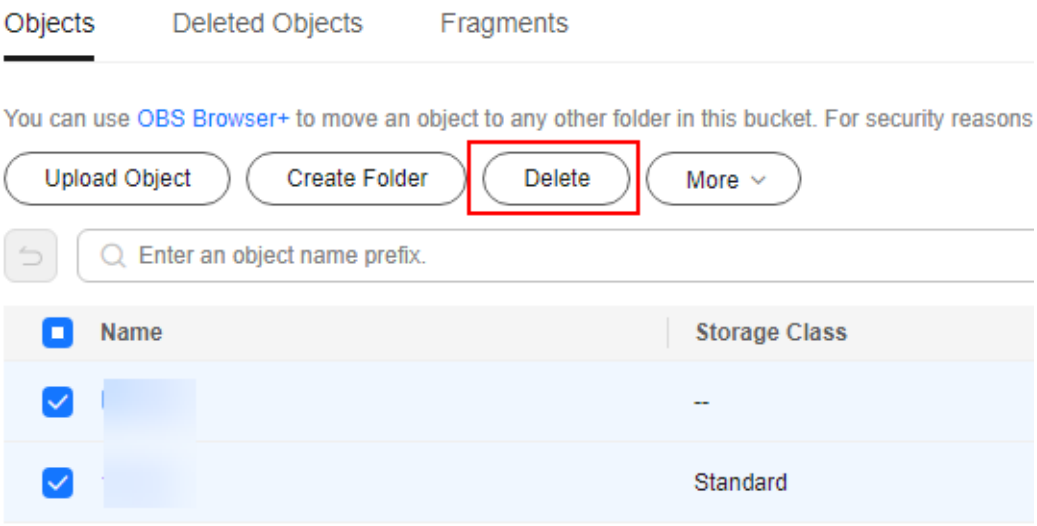
Step 3 Select the file or folder you want to delete and choose **More** > **Delete** on the right.

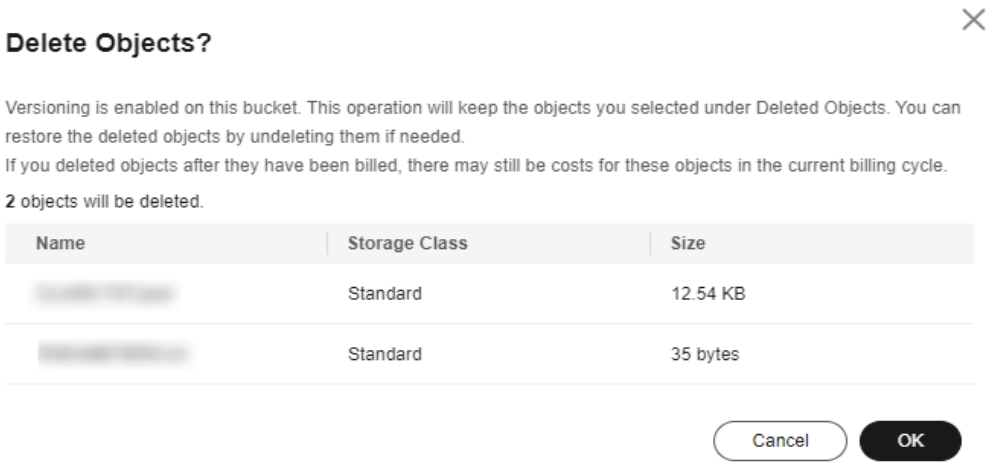
You can select multiple files or folders and click **Delete** above the object list to batch delete them.

Figure 4-19 Deleting a file or folder



Step 4 Click **OK** to confirm the deletion.

Figure 4-20 Deleting objects



CAUTION

If you delete an object from a bucket with versioning enabled, the object is not permanently deleted but retained in the **Deleted Objects** list. All versions of the object are still kept in the bucket and are billed for storage. If you need to permanently delete the object, see the following steps.

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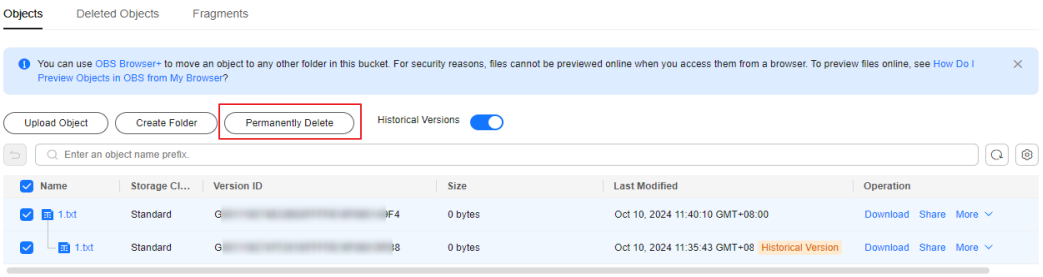
Step 5 Permanently delete an object or a folder from an OBS bucket with versioning enabled:

1. Enable **Historical Versions**.
2. Select all the versions of the object to be permanently deleted and click **Permanently Delete** above the search bar.

   Figure 4-21 Permanently deleting an object



3. Click **OK**.

----End

Using APIs

Deleting an Object

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Go to the bucket from which you want to delete a file or folder.

Step 3 Right-click the file or folder to be deleted and click **Delete**.

You can select multiple files or folders and choose **More** > **Delete** above the list to batch delete them.

Step 4 In the displayed dialog box, click **Yes**.

----End

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
  - Deleting a single object

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```
obsutil rm obs://bucket/key [-f] [-versionId=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

  - Deleting objects in batches

```
obsutil rm obs://bucket/[key] -r [-j=1] [-f] [-v] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

- In Linux or macOS
  - Deleting a single object

```
./obsutil rm obs://bucket/key [-f] [-versionId=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

  - Deleting objects in batches

```
./obsutil rm obs://bucket/[key] -r [-j=1] [-f] [-v] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

Examples

- Take the Windows OS as an example. Run the **obsutil rm obs://bucket-test/key -f** command to delete a single object named **key** in bucket **bucket-test**.

```
obsutil rm obs://bucket-test/key -f

Start at 2024-09-25 04:48:10.1147483 +0000 UTC

Delete object [key] in the bucket [bucket-test] successfully, cost [152], request id [0000016979E1D2B2860BB5181229C72C]
```

- Take the Windows OS as an example. Run the **obsutil rm obs://bucket-test -r -f** command to delete all objects in bucket **bucket-test**.

```
obsutil rm obs://bucket-test -r -f
Start at 2024-09-30 08:46:55.5335644 +0000 UTC

[=============================================] 100.00% 21s
Succeed count:   1313      Failed count:    0
Task id: 95936984-f81a-441a-bba0-1fd8254d9241
```

- Take the Windows OS as an example. Run the **obsutil rm obs://bucket-test/key -r -f** command to delete all objects and folders prefixed with **key** in bucket **bucket-test**.

```
obsutil rm obs://bucket-test/key -r -f
Start at 2024-09-30 08:49:09.5602115 +0000 UTC

[=============================================] 100.00% 21s
Succeed count:   10      Failed count:    0
Task id: 79ab59ec-7e00-4f22-8c88-465faa834125
```

Parameter Description

Parameter	Optional or Mandatory	Description
bucket	Mandatory	The bucket name
key	Mandatory for deleting a single object. Optional for deleting objects in batches.	The name of the object to be deleted, or the name prefix of the objects to be deleted in batches **NOTE** If this parameter is left blank when deleting objects in batches, all objects in the bucket are deleted.

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Parameter	Optional or Mandatory	Description
fr	Optional for deleting a single object (additional parameter)	Generates an operation result file when deleting an object.
f	Optional (additional parameter)	Runs in force mode.
versionId	Optional for deleting a single object (additional parameter)	The version ID of the object to be deleted.
r	Mandatory for deleting objects in batches (additional parameter)	Deletes objects in batches based on a specified object name prefix. **CAUTION** When you batch delete objects, all objects with the specified prefix will be deleted.
j	Optional for deleting objects in batches (additional parameter)	The maximum number of concurrent tasks for deleting objects in batches. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.
v	Optional for deleting objects in batches (additional parameter)	Deletes versions of an object and the delete markers in batches based on a specified object name prefix.

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Parameter	Optional or Mandatory	Description
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (possibly success and failure files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. **NOTE** • A result file should be named as follows: **rm_{succeed | failed}_report**_*time*_**TaskId.txt**. • By default, the maximum size of a single result file is 30 MB and the maximum number of result files that can be retained is 1,024. You can set the maximum size and number by configuring **recordMaxLogSize** and **recordBackups** in the configuration file. • If there are multiple folders and files and you need to confirm the details of a failed task, refer to the failure result file **cp_failed_report**_*time*_*TaskId*.**txt** in the result folder and the **log files** in the log path.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Response

Field	Description
Parallel	The parameter **-p** in the request
Jobs	The parameter **-j** in the request
Threshold	The parameter **-threshold** in the request

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Field	Description
PartSize	The parameter **-ps** in the request
Exclude	The parameter **-exclude** in the request
Include	The parameter **-include** in the request
TimeRange	The parameter **-timeRange** in the request
VerifyLength	The parameter **-vlength** in the request
VerifyMd5	The parameter **-vmd5** in the request
CheckpointDir	The parameter **-cpd** in the request
OutputDir	The parameter **-o** in the request
ArcDir	The parameter **-arcDir** in the request
Succeed count	The number of successful tasks
Failed count	The number of failed tasks
Skip count	The number of tasks that are skipped during incremental upload, download, or copy, and synchronous upload, download, or copy. **NOTE** Skipped tasks are recorded into successful tasks.
Warning count	The number of tasks that are executed successfully but contain warnings. **NOTE** • The task for which a warning is generated may be a failure or a success, which needs to be further determined according to the corresponding result list. • The number of tasks that generate warnings is independent of the number of successful or failed tasks. The total number of tasks is the number of successful tasks plus the number of failed tasks.
Succeed bytes	The number of bytes that are successfully uploaded or downloaded.
max cost	The maximum duration of all tasks, in ms
min cost	The minimum duration of all tasks, in ms
average cost	The average duration of all tasks, in ms
average tps	The average number of tasks completed per second
Task id	The unique ID of an operation, which is used to search for the result file generated for a batch task

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4.7.2 Undeleting an Object

Scenarios

If versioning is not enabled for a bucket, deleted objects cannot be recovered.

After a bucket has **versioning** enabled, deleting a file from the **Objects** list does not permanently delete it. Instead, OBS inserts a delete marker and retains the deleted file in the **Deleted Objects** list. You can recover the deleted object by using the **Undelete** operation.

Important Notes

- Files can be undeleted, but folders cannot.

  After you undelete a deleted file, the file is recovered and will appear in the **Objects** list. Then you can perform basic operations on the file as you normally do on other objects. If the file was stored in a folder before deletion, it will be recovered to its original path after you undelete it.
- Files in the **Deleted Objects** list still retain multiple versions. When deleting different versions, keep the following points in mind:
  - Deleting a version with the delete marker actually recovers the file instead of permanently deleting it. For details, see **Related Operations**.
  - Deleting a version without the delete marker permanently deletes this version. This version will not be recovered, even if the file is recovered later.

Prerequisites

- Versioning has been enabled for the bucket. For details, see **Versioning**.
- The file to be recovered is in the **Deleted Objects** list and has at least one version without the delete marker.

Undeleting an Object

You can use **OBS Console** to undelete an object.

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Click **Deleted Objects**.

Step 4 In the row of the deleted file you want to recover, click **Undelete** on the right.

You can select multiple files and click **Undelete** above the object list to batch recover them.

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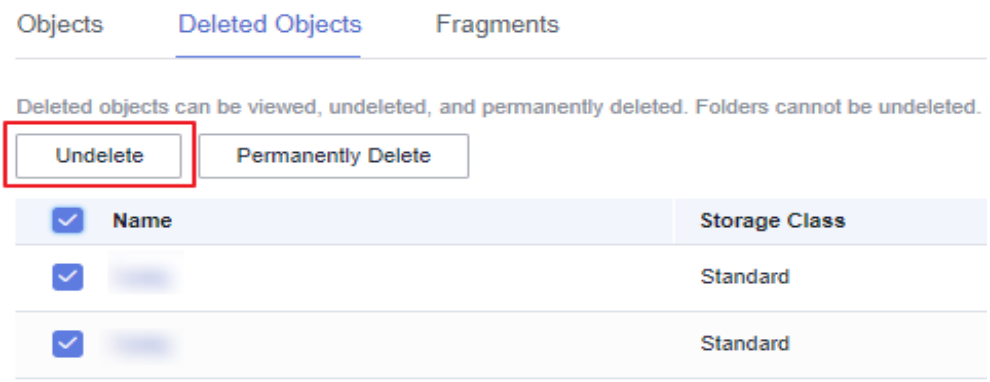
Figure 4-22 Undeleting a file



----End

Related Operations

Recover a file by deleting its version with the delete marker:

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

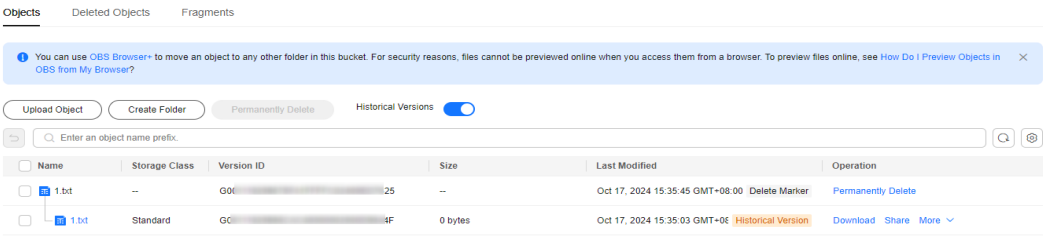
Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Enable **Historical Versions**.

Step 4 Locate the file to be recovered. You can see all its historical versions.

- Delete the version with a delete marker. The file will be recovered and retained in the **Objects** list.
- If you delete a version without the **Delete Marker**, that version will be permanently deleted.

Figure 4-23 Versions of files in the **Deleted Objects** list



----End

4.7.3 Deleting Fragments

Scenarios

Fragments are the incomplete data in buckets. When data is uploaded to OBS using a multipart upload, there will be fragments generated if the multipart upload fails because of the following and other possible causes:

- Frequent disconnections from the OBS server due to poor network conditions

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- Manual upload interruptions
- Device failures
- Sudden power outages

Fragments generated from upload failures are stored in OBS. You can manually delete the fragments by following the instructions provided in this section. You can also **resume the interrupted or failed multipart upload to remove the fragments**.

NOTE

- If there are fragments left in your bucket, your attempt to delete the bucket will fail. In such case, delete all of the fragments first.
- The storage of fragments is billable. If expenditures are stilled generated even if there are no objects in your bucket, check whether there are fragments in it and delete them (if any).

Billing

You will be billed for storing fragments in OBS.

Ways to Delete Fragments

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to delete fragments.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Click **Fragments**, select the fragment that you want to delete, and click **Delete** on the right.

You can also select multiple fragments and click **Delete** above the fragment list to batch delete them.

Step 4 Click **OK** to confirm the deletion.

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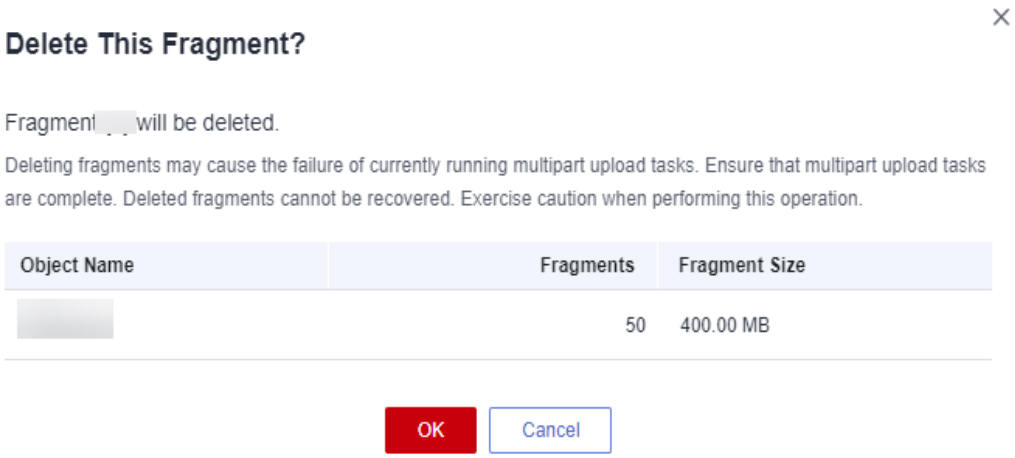
Figure 4-24 Deleting fragments



----End

Using APIs

You can use APIs to delete fragments from a bucket by doing as follows:

1. Use the **API for listing the initiated multipart uploads in a bucket** to list all the multipart uploads and obtain their upload IDs.
2. Use the **API for aborting a multipart upload** to abort the multipart uploads to delete all fragments.

Using SDKs

With an OBS SDK, fragments are generated only when a multipart upload is not completed. You can delete the fragments by aborting the multipart upload. The procedure is as follows:

1. Use the **ObsClient.listMultipartUploads** API to list all multipart uploads and obtain their upload IDs.
2. Use the **ObsClient.abortMultipartUpload** API to abort all of the listed multipart uploads to delete all fragments.

Java	Python	C: not supported	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Select the bucket you want and click **Fragments**.

Step 3 In the **Fragments** window, select the unwanted fragments and click **Delete** above the list. You can also click **Delete All** above the list to delete all fragments. Click in the upper right corner to refresh the fragment list, as shown in **Figure 4-25**.

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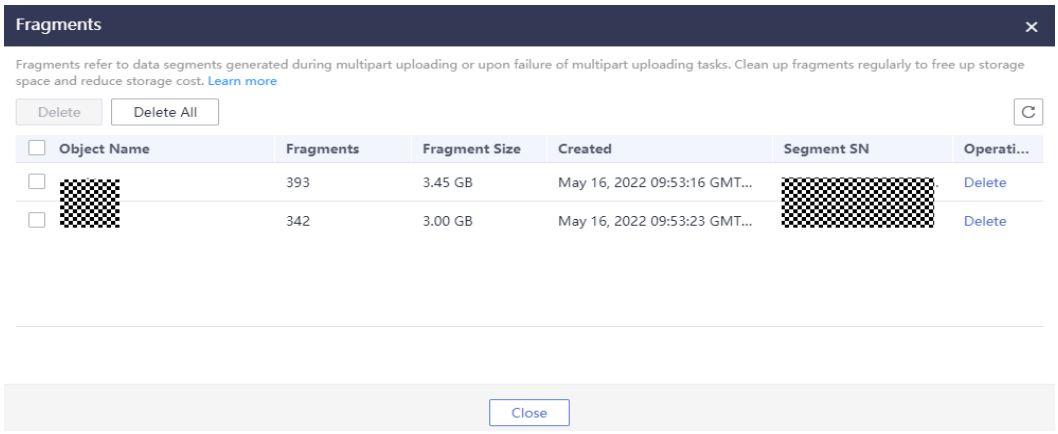
Figure 4-25 Fragment management



Step 4 In the displayed **Warning** dialog box, confirm the delete information and click **Yes**.

Step 5 Click **Yes**.

The **Fragments** window is displayed. You can close this window to go back to the OBS Browser+ homepage.

----End

Using the CLI Tool - obsutil

With obsutil, you can delete fragments by deleting the corresponding multipart upload. If a bucket has more than one multipart uploads, you need to delete all the multipart uploads to delete all fragments in the bucket.

For details, see **Deleting a Multipart Upload**.

Related Operations

OBS allows you to manage tasks. If a multipart upload fails or is interrupted, you can resume it with the following tools. Once the upload is completed, fragments will disappear.

Table 4-13 Tools for deleting fragments

Tool	Operation Guide
OBS Browser+	On OBS Browser+, run the upload task that generates the fragments. Once it completes, fragments are cleared. For details, see **Managing Failed Tasks** and **Managing Suspended Tasks**.
obsutil	With obsutil, you can resume a failed upload based on its task ID recorded in the result list. After the upload is completed, the fragments will disappear. For details, see **Resuming a Failed Upload**.

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Tool	Operation Guide
OBS SDKs	OBS SDKs provide resumable upload by recording the upload progress. You can read the recorded progress and resume an interrupted or failed multipart upload. For details, see the section about resumable upload in the *SDK Reference*.

4.8 Managing Folders

4.8.1 Creating a Folder

Scenarios

You can create folders in a bucket to help organize and manage your data in OBS.

Unlike traditional file systems, OBS does not use the concepts of files and folders. Instead, it provides a way to simulate folders for easier data management. **OBS Console** or OBS Browser+ simulates a folder by adding a slash (/) to the end of an object name. When objects are listed via the API, the returned object name is the path, and the content after the last slash (/) is considered the actual object name. If the path ends with a slash (/), it indicates a folder. The hierarchical depth of a folder has no impact on object access performance.

Ways to Create a Folder

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to create a folder.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Click **Create Folder**, or click a folder in the object list to open it and click **Create Folder**.

Step 4 In the **Folder Name** text box, enter a name for the folder.

- You can create single-level or multi-level folders.
- The name cannot contain the following special characters: \:*?"<>|
- The name cannot start or end with a period (.) or slash (/).
- The folder's absolute path cannot exceed 1,023 characters.
- Any single slash (/) separates and creates multiple levels of folders at once.
- The name cannot contain two or more consecutive slashes (/).

Step 5 Click **OK**.

----End

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Using APIs

To create a folder in OBS is to create an object whose size is 0 and whose name ends with a slash (/), in essential. For details, see **Using APIs**.

Using SDKs

To create a folder in OBS is to create an object whose size is 0 and whose name ends with a slash (/), in essential. For details, see **Using SDKs**.

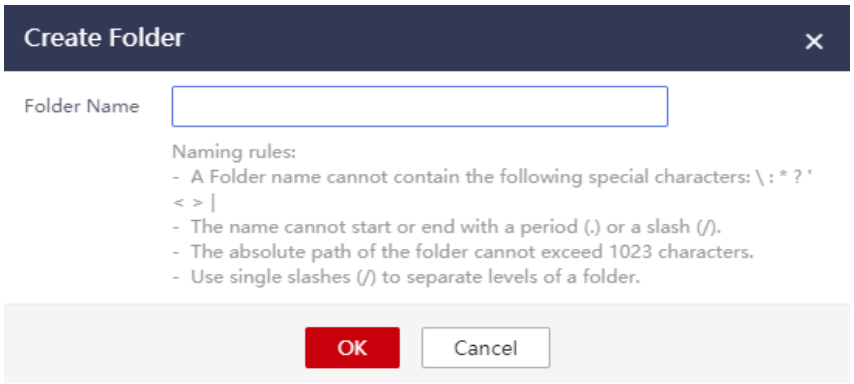
Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Click the bucket where you want to create a folder and click **Create Folder**.

Step 3 In the displayed dialog box, enter a folder name and click **OK**, as shown in **Figure 4-26**.

Figure 4-26 Creating a folder



- A folder name cannot contain the following special characters: \ : * ? ' < > |
- A folder name cannot start or end with a period (.) or slash (/).
- A folder name cannot exceed 1,023 bytes. The length of a folder name is the sum of the length of its own name and the length of its upper-level directory names. The total length cannot exceed 1,023 bytes. Directories of different levels are automatically separated by slashes (/). For example, if the upper-level directory of **folder01** is **folder02**, the name length of folder **folder01** is the length of **folder02/folder01/**.
- A single slash (/) separates and creates multiple levels of folders.

NOTE

If an access deny message is displayed when you are creating a folder, possible causes are as follows:

- Access to the bucket is restricted by an ACL. For example, you do not have the write permission for the bucket.
- Access to the bucket is restricted by a bucket policy. For example, you do not have the write permission for the bucket, or write operations cannot be performed on the bucket during the current period.

If such message is displayed, check ACL and policy settings of the bucket and resolve the problem accordingly.

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Step 4 Click **OK**.

----End

Using the CLI Tool - obsutil

Command Line Structure

- In Windows
  - Creating a folder in a specified bucket
    ```
    obsutil mkdir obs://bucket/folder[/subfolder1/subfolder2] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Creating a folder in the local file system
    ```
    obsutil mkdir folder_url [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
- In Linux or macOS
  - Creating a folder in a specified bucket
    ```
    ./obsutil mkdir obs://bucket/folder[/subfolder1/subfolder2] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Creating a folder in the local file system
    ```
    ./obsutil mkdir folder_url [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

Examples

- Take the Windows OS as an example. Run the **obsutil mkdir obs://bucket-test/folder1/folder2** command to create a folder in a bucket.
  ```
  obsutil mkdir obs://bucket-test/folder1/folder2

  The bucket [bucket-test] does not support POSIX, create folder(s) step by step
  Create folder [obs://bucket-test/folder1/] successfully, request id [0000016979E1D23C860BB3D8E4577C5E]
  Create folder [obs://bucket-test/folder1/folder2] successfully, request id [0000016979E1D2B2860BB5181229C72C]
  ```

Parameter Description

Parameter	Optional or Mandatory	Description
bucket	Mandatory when creating a folder in a specified bucket	The bucket name
folder	Mandatory when creating a folder in a specified bucket	The folder path in the bucket. This value can contain multi-level folders. Separate each level with a slash (/).

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Parameter	Optional or Mandatory	Description
folder_url	Mandatory when creating a folder in the local file system	The folder path in the local file system. The value can be an absolute path or a relative path.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Follow-up Operations

You can click **More** > **Copy Path** in the **Operation** column to copy the path of the folder and share it with others. Then they can open the bucket where the folder is stored and enter the path in the search box above the object list to find the folder.

4.8.2 Sharing a Folder

Scenarios

You can share your folders in OBS with others.

Folder can be shared temporarily or permanently.

Background Information

- Temporary sharing:

  Share a folder to other users through the temporary URL of the file. Folder sharing is temporary. All sharing URLs are only valid for a limited period of time.

  Folders can be temporarily shared by access code or URL:

  Sharing by access code

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You need to prepare a six-digit extraction code before sharing a folder. After the sharing task is created, OBS aggregates the download links of all objects in the folder to a static website that is hosted by a public OBS bucket. Then anyone who has the created temporary URL and access code can access the static website and download the shared files.

A temporary URL consists of the access domain name and the temporary authentication information of a folder. Example:
https://e-share.obs-website.ap-southeast-1.myhuaweicloud.com:443/image.png?token=*xxx*

For details about the temporary authentication method and parameters, see **Authentication of Signature in a URL** in the *Object Storage Service API Reference*.

Sharing by URL

You can specify a validity period and then share the generated link with others. Anyone can use a signature to access all objects in the shared folder.

A temporary URL for accessing an object in a folder consists of a bucket domain name (prefix), an object path, and signature information (suffix).

- Permanent sharing:

  If you set the permission for an object to allow anonymous users to read it, anonymous users can access the object through the URL that you shared. For details about how to configure permissions, see **Granting Public Read Permissions on Objects to Anonymous Users**.

  For details about how to obtain the object access URL, see **How Do I Obtain the Access Path to an Object?**

  If access to an object using the URL fails, fix the problem by referring to **Why Can't I Access an Object Through Its URL?**

Constraints

- The following table describes the URL validity period of the folders that are temporarily shared in different ways.

Way	URL Validity Period
OBS Console	The URL is valid for 1 minute to 18 hours. After an object is shared, the system will generate a URL that contains the temporary authentication information, valid for five minutes since its generation by default. Each time you change the validity period of a URL, OBS obtains the authentication information again to create a new shared URL. This new URL is in effect immediately upon the change. If you need a longer validity period, you can use OBS Browser+ to set a validity period of up to one year. If you want a shared object to be permanently valid, **use a bucket policy to grant anonymous users the public read permission for the folder**.
APIs	Configure parameter **Expires** to specify when a temporary authorization expires. The temporary authorization expires in 24 hours.

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Way	URL Validity Period
OBS Browser+	When you log in to OBS Browser+ using an account and password, a shared URL can be valid for 24 hours at most. The default validity period is 10 hours. If a longer validity period is required, use the permanent AK/SK for login.
obsutil	Use the additional parameter **vp** to specify how long an authorization code is valid. The default validity period is one day. The allowed units include m (months), w (weeks), d (days), h (hours), min (minutes), and s (seconds). If no time unit is specified, the value is calculated in seconds.

- Folder sharing is restricted to a few regions only.
- Only buckets whose version is 3.0 support folder sharing. For details about how to query the bucket version, see **Checking OBS Version (OBS 2.0 or OBS 3.0)**.
- Archive objects in a folder must be restored in the bucket before they can be downloaded.
- Deep Archive objects in a folder must be restored in the bucket before they can be downloaded.

Ways to Share a Folder

You can use OBS Browser+, obsutil, or **OBS Console** to share a folder.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Select the folder to be shared and click **Share** in the **Operation** column.

Step 4 In the **Share Folder** dialog box, select **Access code** or **URL** for **Share By**.

Step 5 Share the folder by access code.

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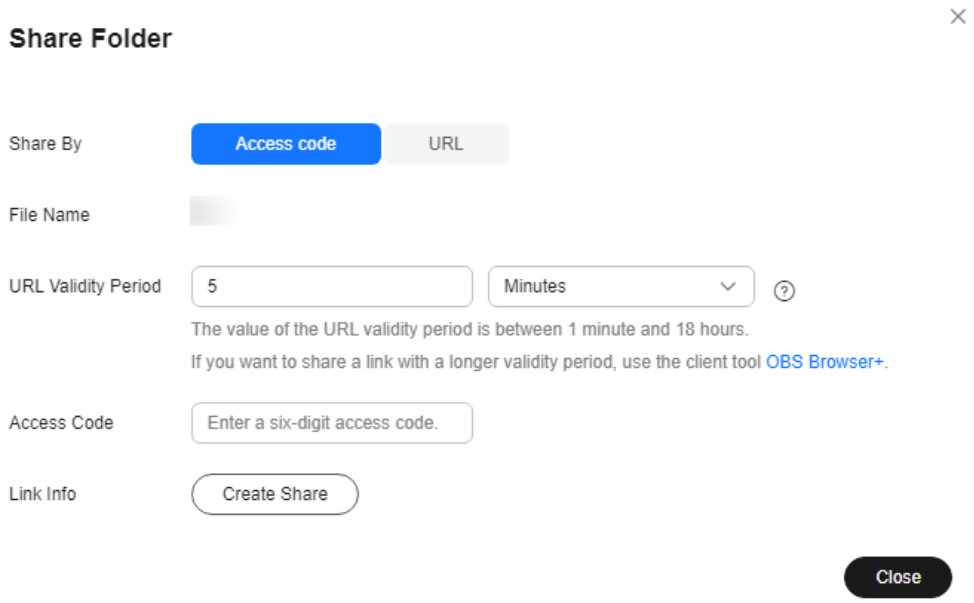
Figure 4-27 Sharing the folder by access code



1. Configure parameters.

   Table 4-14 Parameters for sharing a folder by access code

Parameter	Description
URL Validity Period	A validity period is from one minute to 18 hours. The default value is five minutes. Within the URL validity period, anyone who has the URL can access the folder.
Access Code	A six-digit code. An access code is required to access objects in the shared folder.

2. Click **Create Share** to generate a sharing URL for the folder.
3. Send the link and access code to others for them to access the folder.
4. Verification:
   a. Access the shared folder in a browser.
      i. Open the shared URL in a web browser.
      ii. In the dialog box that is displayed, enter the access code to see if the folder can be accessed.
   b. Access the shared folder on OBS Browser+.
      i. Start OBS Browser+.
      ii. On the login page, click **Authorization Code Login**.
      iii. Enter the authorization code and access code.
      iv. Click **Log In** to access the shared folder.

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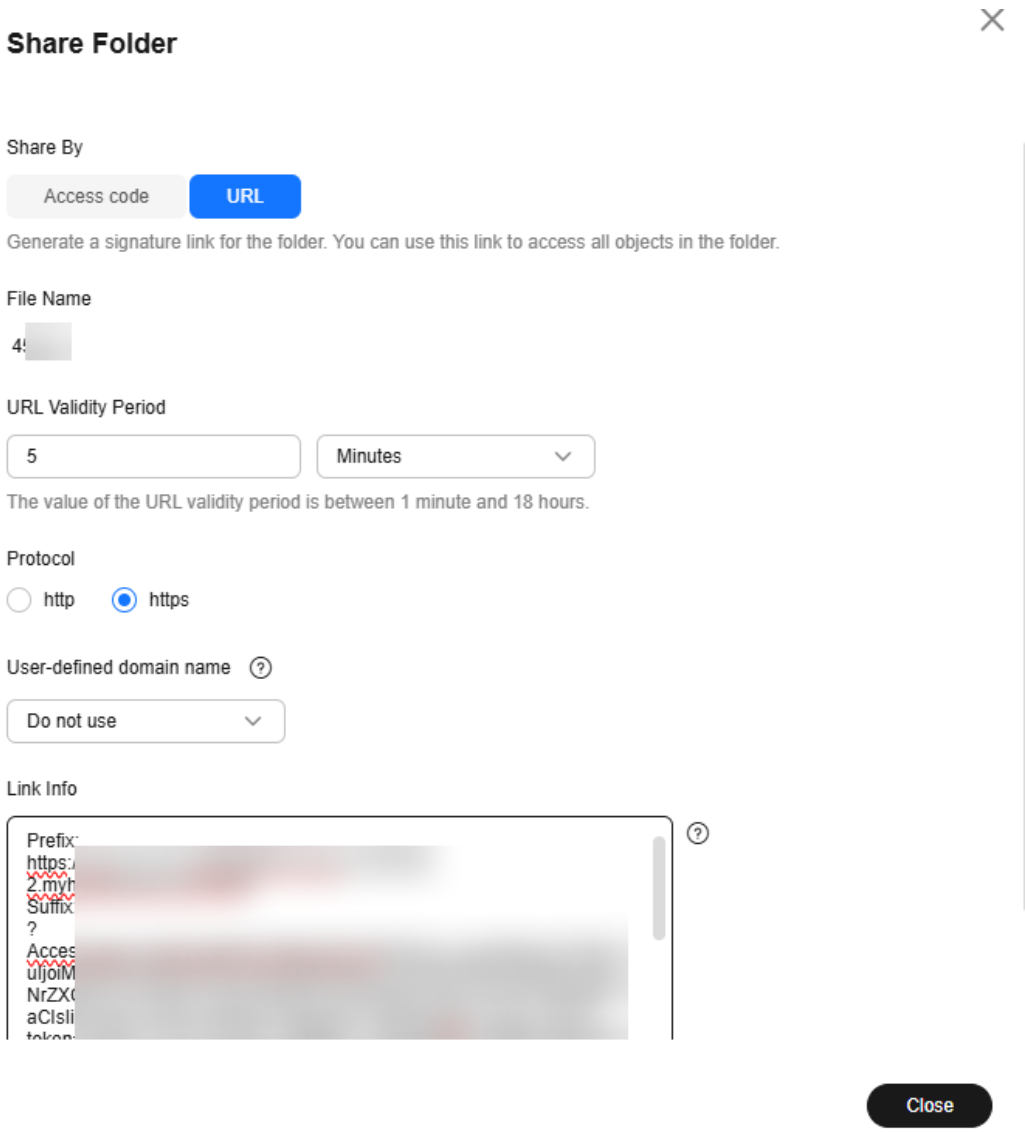
Step 6 Share the folder by URL.

Figure 4-28 Sharing the folder by URL



1. Set the URL validity period.
   - A shared URL can remain valid between one minute and 18 hours. During that time, anyone can use the shared URL to access the folder.
   - The moment the **Share Folder** dialog box is opened, the link is in effect and valid for five minutes by default. Each time you change the URL validity period, the link takes effect again and changes accordingly. You need to re-share the link.
2. Configure parameters.

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Table 4-15 Parameters for sharing a folder by URL

Parameter	Description
URL Validity Period	After the specified amount of time, the URL will expire. – A shared URL can remain valid between one minute and 18 hours. During that time, anyone can use the shared URL to access the folder. To share a link with a longer validity period, you can use **OBS Browser+**. – The moment the **Share Folder** dialog box is opened, the link is in effect and valid for five minutes by default. Each time you change the URL validity period, the link takes effect again and changes accordingly. You need to re-share the link.
Protocol	The protocol of the shared link The protocol defaults to **https**. – **http**: It is for scenarios where security is not a major concern. – **https**: It is for scenarios where security is a major concern. HTTPS uses SSL or TLS to secure data transmission, which ensures data confidentiality and integrity. It also verifies the server's identity through certificates to prevent attacks.
User-defined domain name	Whether a user-defined domain name is used in the shared link – **Do not use**: The bucket's default domain name is used in the shared link. – You can choose a user-defined domain name, which will be part of the shared link. ▪ CDN accelerates access over the Internet (anyone can access CDN). If CDN acceleration is enabled for a user-defined domain name, the shared link containing that domain name may never expire. This means that anyone can access the shared folder at any time.

3. Click **Copy Link** and share the link with another user. The user then can use this link to access all objects in this folder. The sharing link consists of the bucket domain name (prefix) and signature information (suffix). Users can add an object path after the prefix of a sharing link to access or download the specified object in a folder, as shown in **Figure 4-29**.
4. Verify that a user can use the sharing link to access all objects in the folder.
   a. Open a browser.
   b. Enter the sharing link in the address box and press **Enter** to list all objects in the folder.

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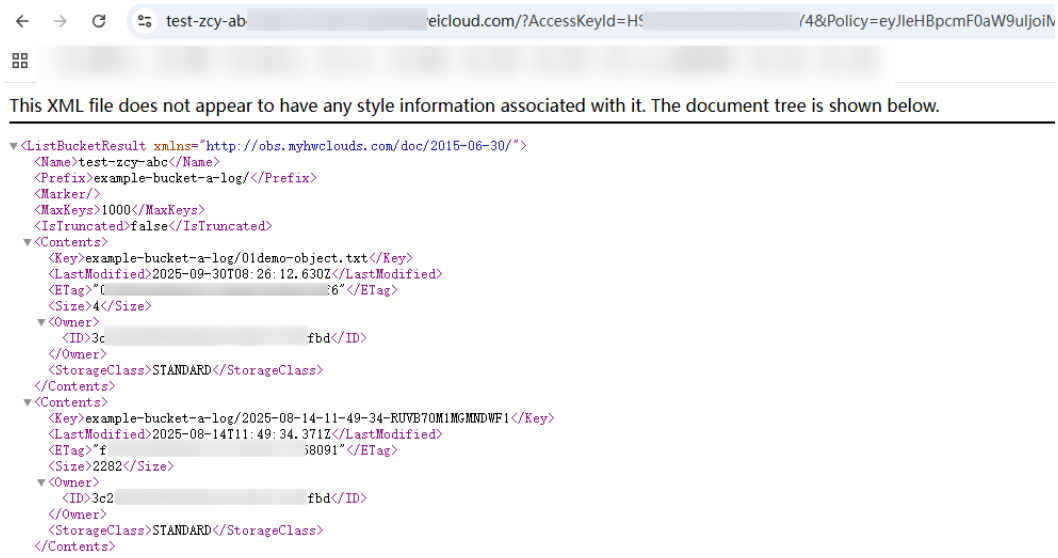
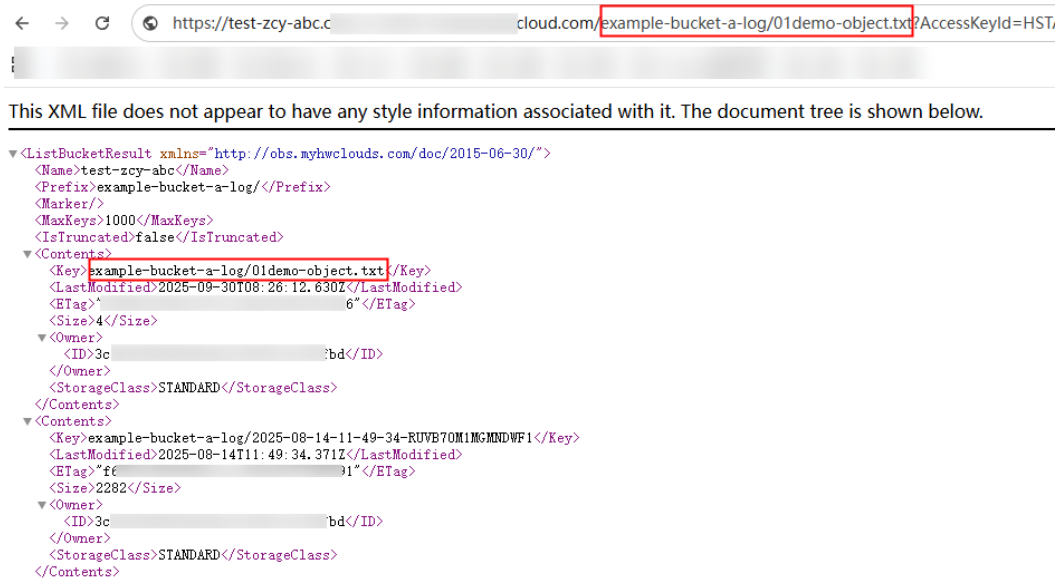
Figure 4-29 Accessing an object with a sharing link



c. Copy the object path and paste it after the prefix.

d. Press **Enter**. You can then access and download the specified object.

Figure 4-30 Accessing and downloading an object in the folder



----End

Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Locate the object you want to share and click next to the object. The window shown in **Figure 4-31** or **Figure 4-32** is displayed.

Figure 4-31 Sharing a file

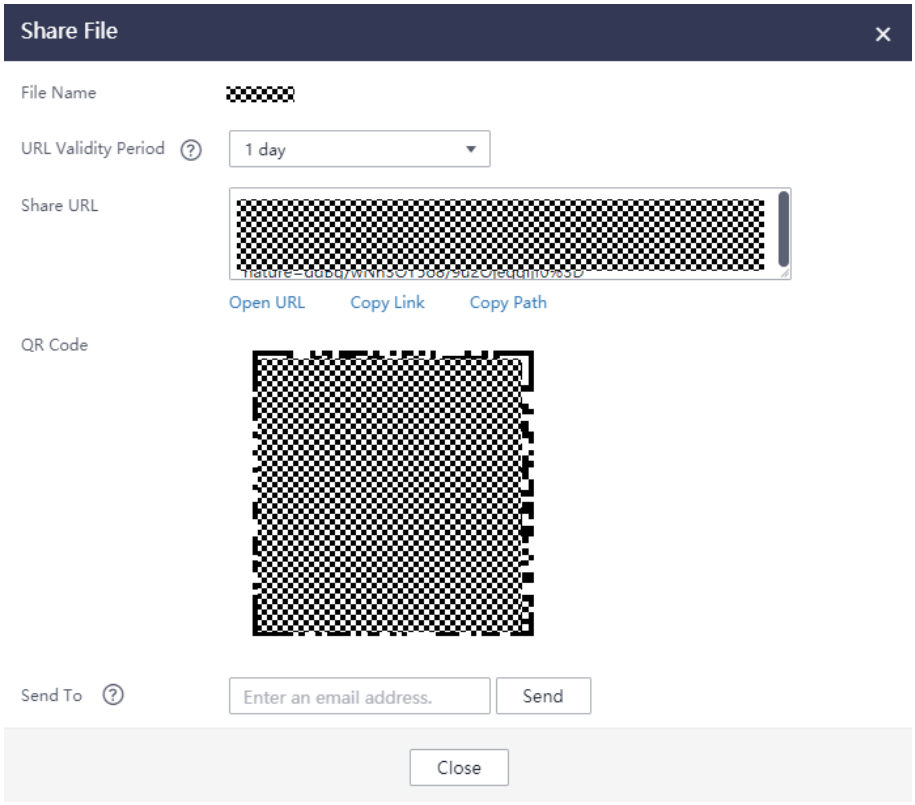


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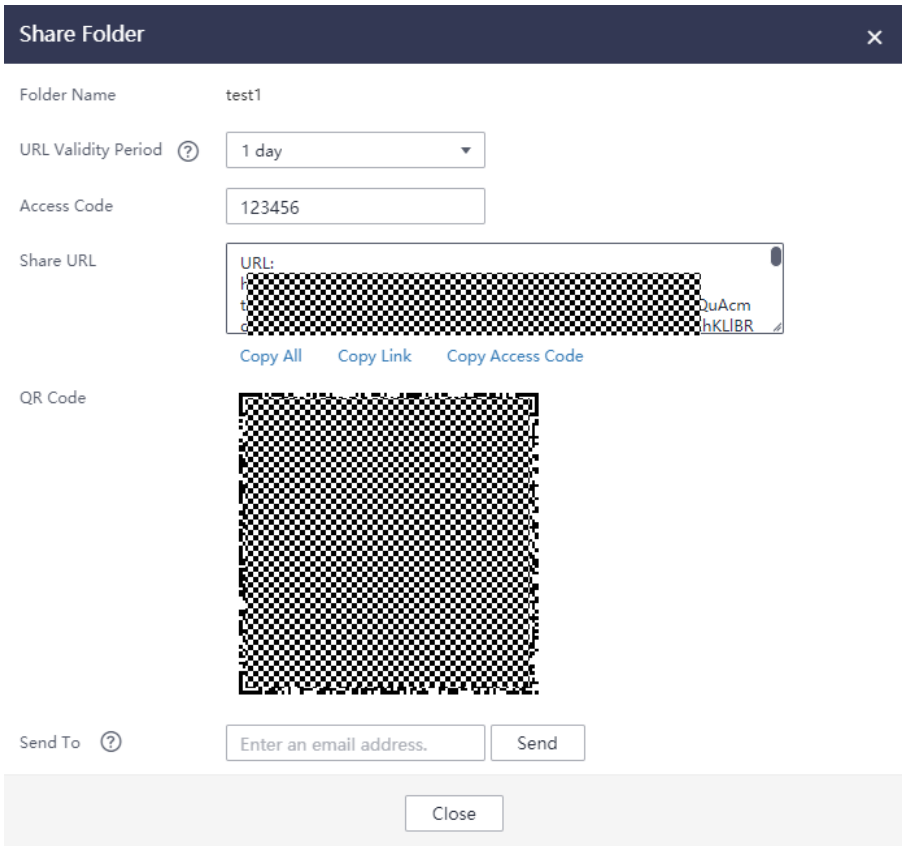
Figure 4-32 Sharing a folder



Step 3 Click **Copy Link** to copy the object link to a browser and open it. Then you can access the object.

NOTE

To allow anonymous users to access Archive objects using URLs, ensure that these objects are in the **Restored** state.

----End

Using the CLI Tool - obsutil

You can use obsutil to specify the bucket name, object name prefix, and access code to create an authorization code for directory sharing.

Command Line Structure

- In Windows
  ```
  obsutil create-share obs://bucket[/prefix] [-ac=xxx] [-vp=xxx] [-dst=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
  ```
- In Linux or macOS
  ```
  ./obsutil create-share obs://bucket[/prefix] [-ac=xxx] [-vp=xxx] [-dst=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
  ```

Examples

- In Windows, you can run the **obsutil create-share obs://bucket/test/ -ac=123456 -vp=1m** command to create an authorization code that is valid within one month.

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```
obsutil create-share obs://bucket/test/ -ac=123456 -vp=1m

Authorization Code:
token=xxxx
```

Parameter	Optional or Mandatory	Description
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Response

Field	Description
Authorization Code	The code for authorization
Access Code	The access code
Valid Until	The expiration time

4.8.3 Analyzing a Folder

You can use Folder Analysis to calculate the size of a folder and the number of objects in a folder.

NOTE

If you use Folder Analysis to calculate the size of a folder, you will be billed for the API calls used to list objects in the bucket. For details, see **Billing Description**.

Constraints

- Only folders with no more than 1 million objects can be analyzed. If your folder contains more objects than that, use the **listing objects** command of obsutil for analysis.

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- It may take some time to analyze folders with a lot of objects.

Ways to Use Folder Analysis

You can use **OBS Console** or obsutil to analyze a folder.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

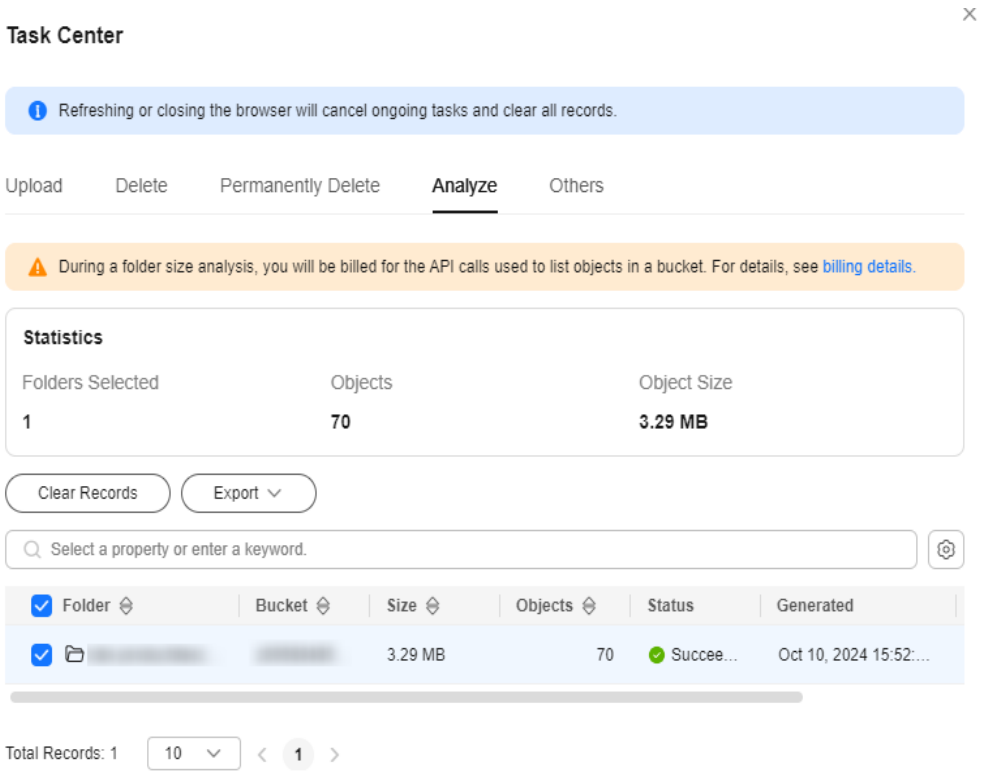
Step 2 In the bucket list of **OBS Console**, click the desired bucket to go to the **Objects** page.

Step 3 Click **Analyze** in the **Operation** column of the folder, or click in the **Size** column.

Step 4 Click **Task Center** on the right corner of the page, and check the analysis result on the **Analyze** tab.

You can see information such as the bucket that a folder belongs to, the size of the folder, the number of objects in the folder, and the analysis status.

Figure 4-33 Folder Analysis



Step 5 (Optional) Click **Clear Records** to clear the analysis results.

Step 6 (Optional) Click **Export** to export all or selected analysis results.

Step 7 (Optional) Select a property to filter the analysis results.

----End

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Using the CLI Tool - obsutil

- **Counting the number of objects in a folder**

obsutil cannot be directly used to obtain the number and size of objects in a folder. You need to **list objects**.

- **Querying the folder size**

Take Linux OS as an example. Run the **./obsutil ls obs://bucket-test/test/ -du -limit=0** command to query the size of the **test** folder in bucket **bucket-test**.

```
./obsutil ls obs://bucket-test/test/ -du -limit=0

Start at 2023-03-16 06:40:18.2773873 +0000 UTC

Listing objects .

Remove the -du parameter to view more information
[DU] Total prefix [test/] size: 990.85MB
```

CAUTION

- The **-du** parameter is only supported by obsutil 5.4.6 and later.

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5 Permissions Control

5.1 Configuring IAM Permissions

5.1.1 Creating an IAM User and Granting OBS Permissions

You can use **IAM** for fine-grained access control over your OBS resources. With IAM, you can:

- Create IAM users for employees based on your enterprise's organizational structure. Each IAM user will have their own security credentials for accessing OBS resources.
- Manage permissions on a principle of least permissions (PoLP) basis.
- Entrust a Huawei Cloud account or cloud service to perform efficient O&M on your OBS resources.

If your account does not require individual IAM users, skip this chapter.

Figure 5-1 shows the procedure for granting permissions.

Prerequisites

You have learned about the **OBS permissions** that can be assigned to a user group.

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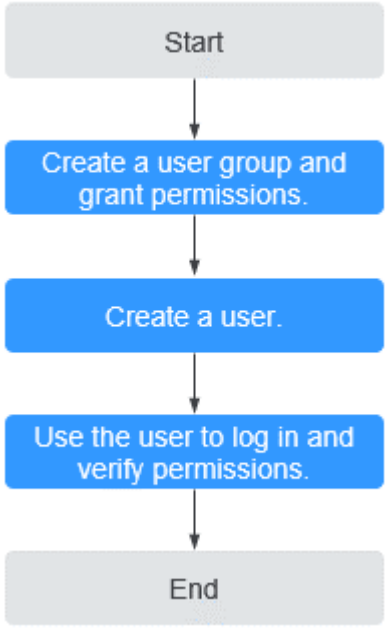
Process

Figure 5-1 Process of granting an IAM user the OBS permissions



The example here describes how to grant an IAM user the **Tenant Guest** permission for OBS.

1. **Create a user group and assign permissions**.

   Create a user group on **the IAM console**, and assign the **Tenant Guest** permission to it.
2. **Create an IAM user and add it to the user group**.

   Create a user on **the IAM console** and add it to the user group created in **1**.
3. **Log in to the console** and verify permissions.

   Log in to the **OBS Console** as the created user and verify the assigned permission.
   - If you can view the bucket list of the account and can click any bucket to obtain its basic information, but you cannot create or delete buckets or perform any other operations, the **Tenant Guest** permission is in effect.
   - Go to an OBS bucket. If you can view the object list and can download objects, but you cannot upload or delete objects or perform any other operations, the **Tenant Guest** permission is in effect.

5.1.2 OBS Custom Policies

Custom policies can be created to supplement the system-defined policies of OBS. For the actions supported for custom policies, see **Bucket-Related Actions** and **Object-Related Actions**.

You can create custom policies in either of the following two ways:

- Visual editor: Select cloud services, actions, resources, and request conditions without the need to know policy syntax.

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- JSON: Edit JSON policies from scratch or based on an existing policy.

For details, see **Creating a Custom Policy**. The following provides examples of common OBS custom policies.

Example Custom Policies

- Example 1: Grant users all OBS permissions.

  This policy allows users to perform any operation on OBS.

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "obs:*:*"
            ]
        }
    ]
}
```

- Example 2: Grant users all permissions for **OBS Console**.

  This policy allows users to perform all operations on **OBS Console**.

  When logging in to **OBS Console**, users may need to access resources of other services, such as CTS audit information, CDN acceleration domain names, and KMS keys. Therefore, in addition to the OBS permissions granted in example 1, the access permissions for other services need to be granted. CDN is a global service, while CTS and KMS are regional ones. You need to configure the **Tenant Guest** permission for the global project and regional projects based on the services and regions that you use.

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "obs:*:*"
            ]
        }
    ]
}
```

- Example 3: Grant users the read-only permission for all directories in a bucket.

  This policy allows users to list and download all objects in bucket **obs-example**.

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "obs:object:GetObject",
                "obs:bucket:ListBucket"
            ],
            "Resource": [
                "obs:*:*:object:obs-example/*",
                "obs:*:*:bucket:obs-example"
            ]
        }
    ]
}
```

- Example 4: Grant users the read-only permission for a specified directory in a bucket.

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This policy allows users to download objects in only the **my-project/** directory of bucket **obs-example**. Objects in other directories can be listed but cannot be downloaded.

```
{
   "Version": "1.1",
   "Statement": [
      {
         "Effect": "Allow",
         "Action": [
            "obs:object:GetObject",
            "obs:bucket:ListBucket"
         ],
         "Resource": [
            "obs:*:*:object:obs-example/my-project/*",
            "obs:*:*:bucket:obs-example"
         ]
      }
   ]
}
```

- Example 5: Grant users the read/write permissions for a specified directory in a bucket.

  This policy allows users to list, download, upload, and delete objects in the **my-project** directory of bucket **obs-example**.

```
{
   "Version": "1.1",
   "Statement": [
      {
         "Effect": "Allow",
         "Action": [
            "obs:object:GetObject",
            "obs:object:ListMultipartUploadParts",
            "obs:bucket:ListBucket",
            "obs:object:DeleteObject",
            "obs:object:PutObject"
         ],
         "Resource": [
            "obs:*:*:object:obs-example/my-project/*",
            "obs:*:*:bucket:obs-example"
         ]
      }
   ]
}
```

- Example 6: Grant users all permissions for a bucket.

  This policy allows users to perform any operation on bucket **obs-example**.

```
{
   "Version": "1.1",
   "Statement": [
      {
         "Effect": "Allow",
         "Action": [
            "obs:*:*"
         ],
         "Resource": [
            "obs:*:*:bucket:obs-example",
            "obs:*:*:object:obs-example/*"
         ]
      }
   ]
}
```

- Example 7: Grant users the permission to deny object upload.

  A deny policy must be used together with other policies. If the permissions assigned to a user contain both "Allow" and "Deny", the "Deny" permissions take precedence over the "Allow" permissions.

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If you grant the system policy OBS OperateAccess to a user but do not want the user to have the object upload permission (which is also a permission allowed by OBS OperateAccess), you can create a custom policy besides the OBS OperateAccess policy, to deny the user's upload permission. According to the authorization principle, the policy with the deny statement takes precedence. This means the user can perform all operations allowed by OBS OperateAccess except for the upload operation. The following is an example of a deny policy:

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Deny",
            "Action": [
                "obs:object:PutObject"
            ]
        }
    ]
}
```

5.1.3 OBS Resources

A resource is an object that exists within a service. OBS resources include buckets and objects. You can select these resources by specifying their paths.

Table 5-1 OBS resources and their paths

Resource Type	Resource Name	Path
Buckets	Bucket	[Format] **obs:*:*:bucket:***Bucket name***</br>[Notes] IAM automatically generates the prefix **obs:*:*:bucket:** for bucket resource paths. By adding *Bucket name* to the end of the generated prefix, you can define a specific path. An asterisk * is allowed to indicate any bucket. An example is given as follows: **obs:*:*:bucket:***

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Resource Type	Resource Name	Path
Objects	Object	[Format] **obs:*:*:object:***Bucket name/Object name*** [Notes] IAM automatically generates the prefix **obs:*:*:object:** for object resource paths. By adding *Bucket name/Object name* to the end of the generated prefix, you can define a specific path. An asterisk * is allowed to any object in the bucket. An example is given as follows: **obs:*:*:object:my-bucket/my-object/*** (indicating any object in the **my-object** directory of bucket **my-bucket**)

5.1.4 OBS Request Conditions

Request conditions are useful in determining when a custom policy is in effect. A request condition consists of a condition key and an operator. Condition keys are either global or service-level and are used in the condition elements of a policy statement. **Global condition keys** (starting with **g:**) are available for operations of all services, while service-level condition keys (starting with a service name acronym like **obs:**) are available only for operations of a specific service. An operator is used together with a condition key to form a complete condition statement.

OBS has a group of predefined condition keys that can be used in IAM. For example, to define an allow permission, you can use the condition key **obs:SourceIp** to filter matching requesters by IP address.

The condition keys and operators supported by OBS are the same as those in the bucket policy. When configuring condition keys in IAM, start them with **obs:**. For details, see **Policy Format**.

5.2 Configuring a Bucket Policy

5.2.1 Creating a Bucket Policy with a Template

OBS Console offers bucket policy templates for common scenarios. You can use the templates to quickly configure bucket policies.

Ways to Configure Bucket Policies

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to configure bucket policies.

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Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Permissions** > **Bucket Policies**.

Step 4 Click **Create**.

Step 5 Choose a policy template. For details about the parameters, see **Bucket Policies**.

Figure 5-2 Choosing the Public Read template

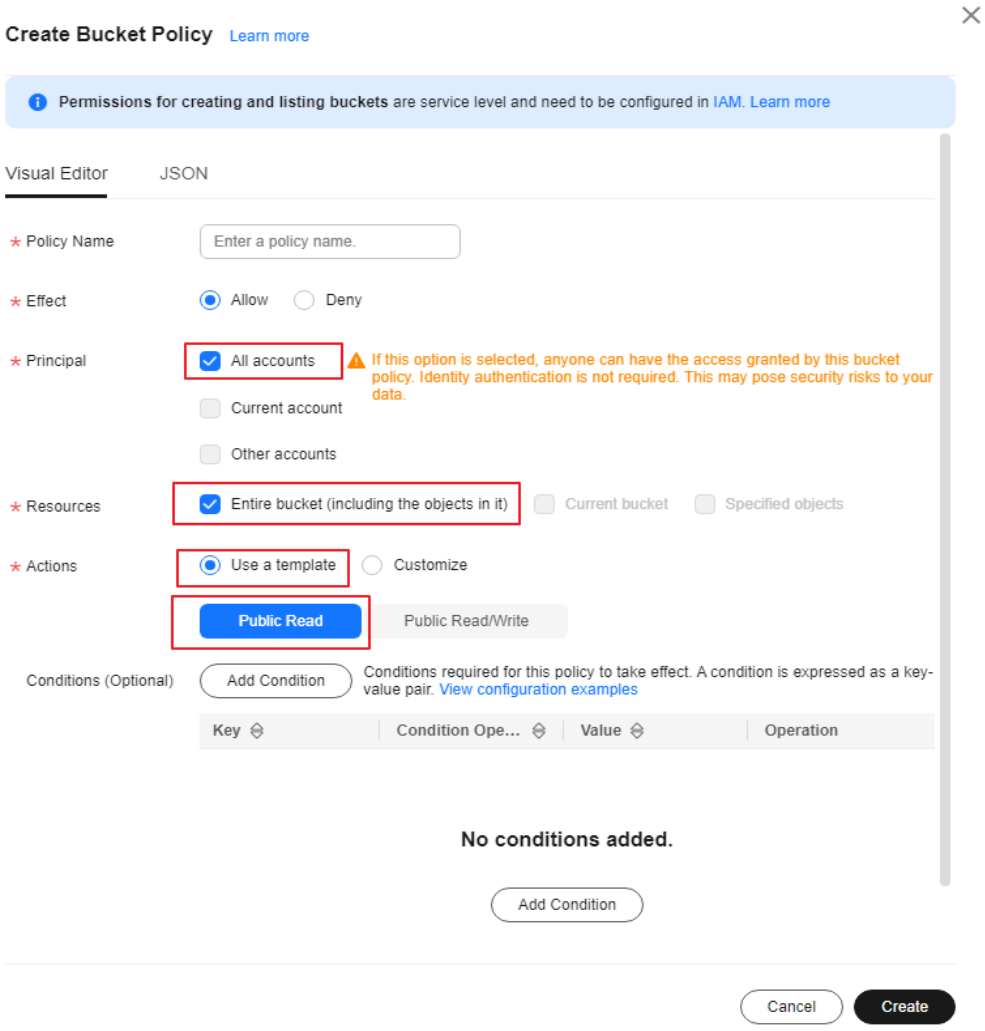

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Figure 5-3 Choosing the Public Read/Write template

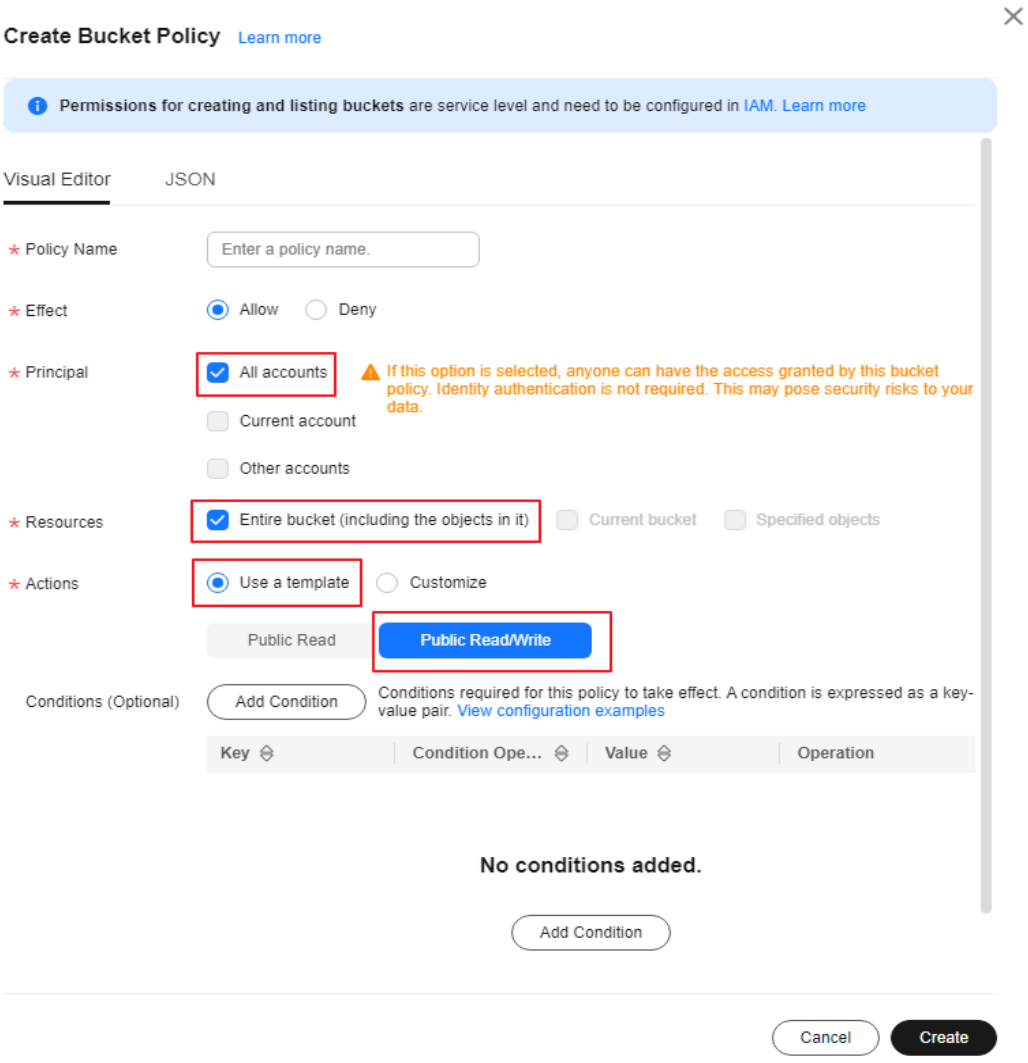

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Figure 5-4 Choosing the Bucket Read-Only template

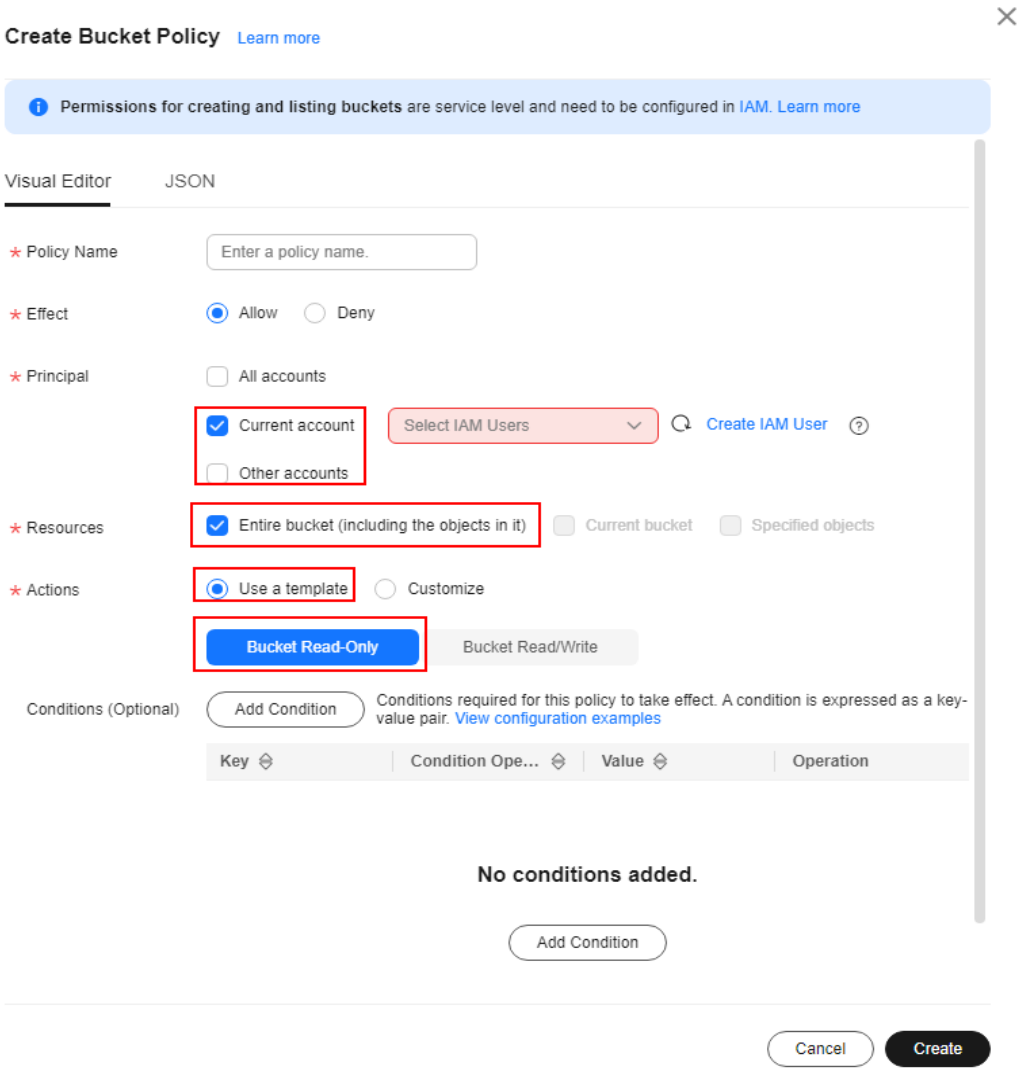

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Figure 5-5 Choosing the Bucket Read/Write template

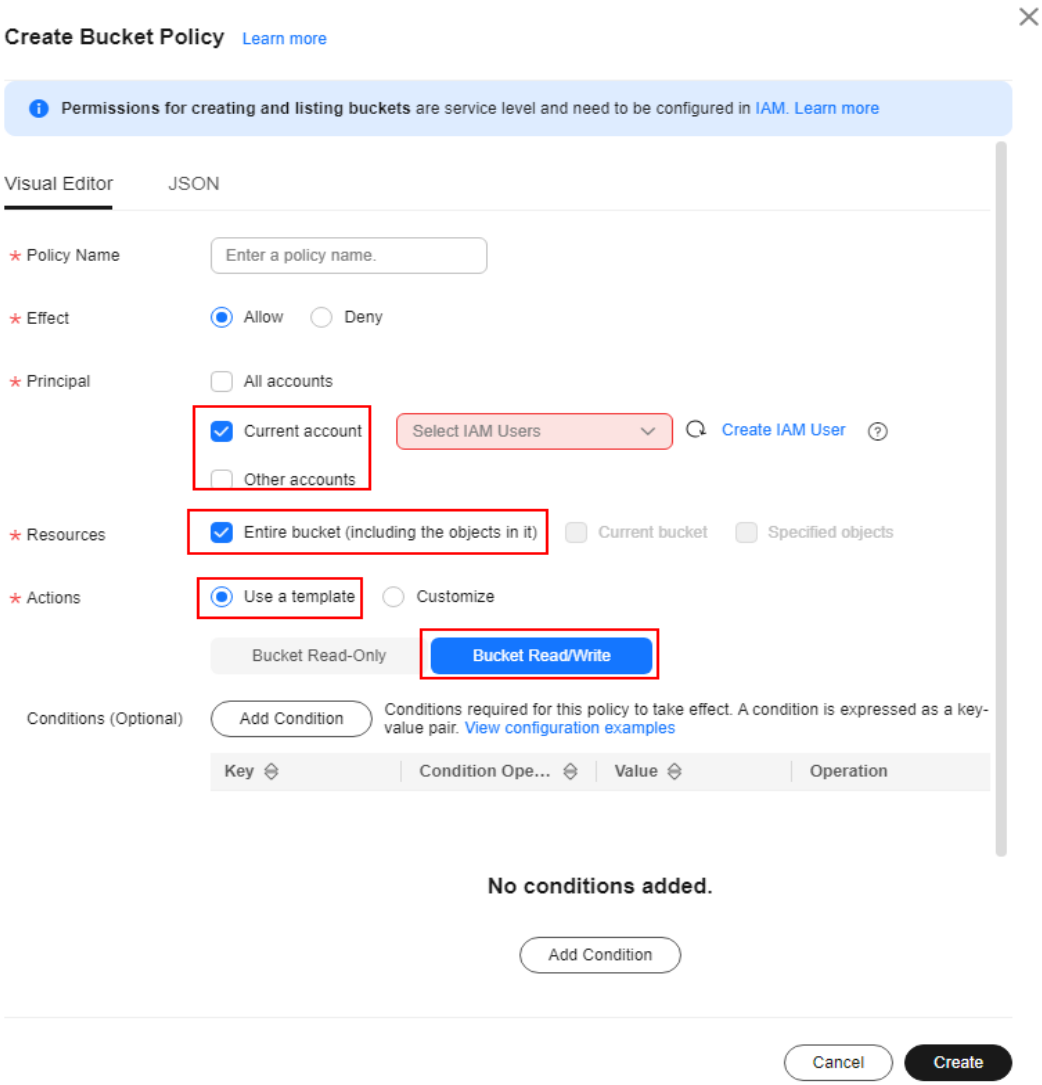

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Figure 5-6 Choosing the Directory Read-Only template

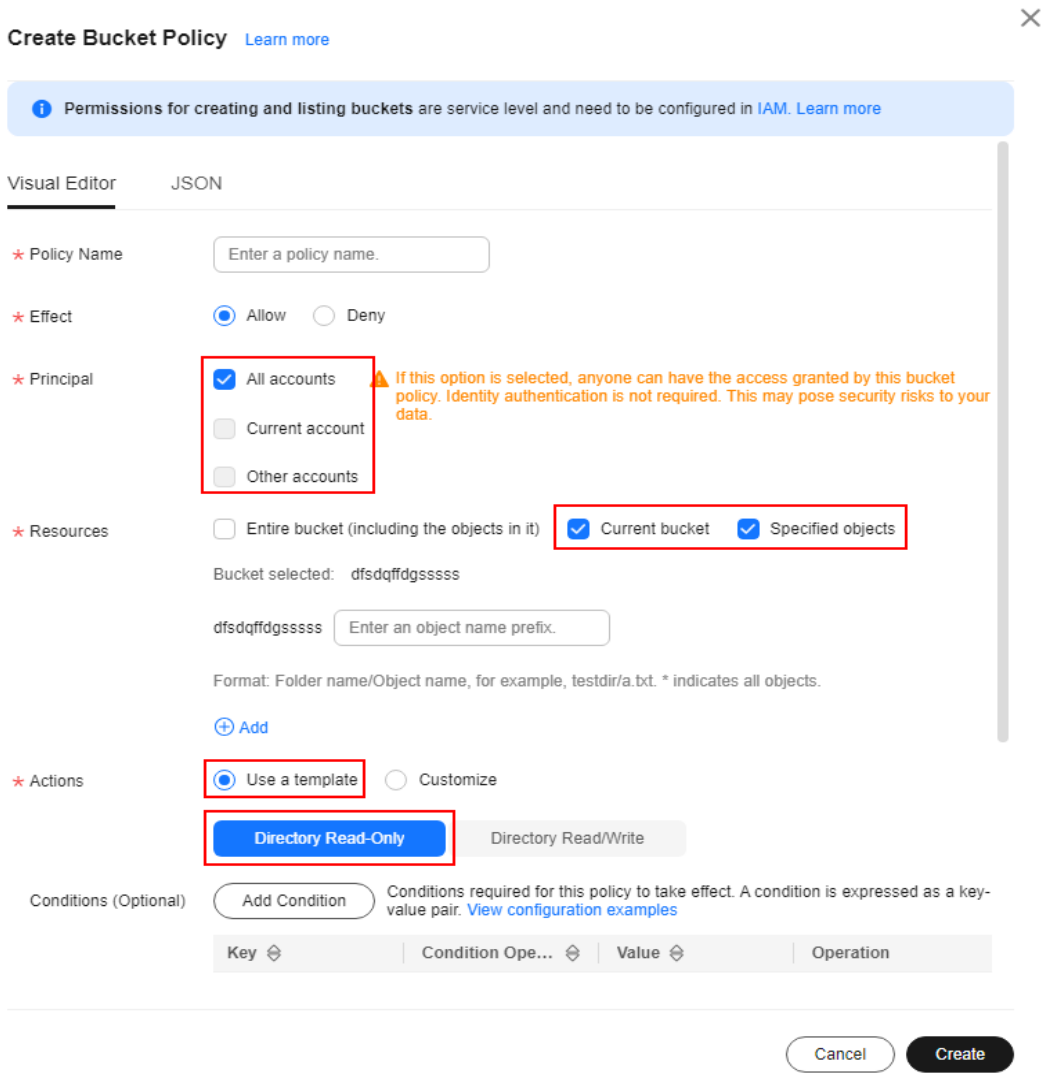

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Figure 5-7 Choosing the Directory Read/Write template

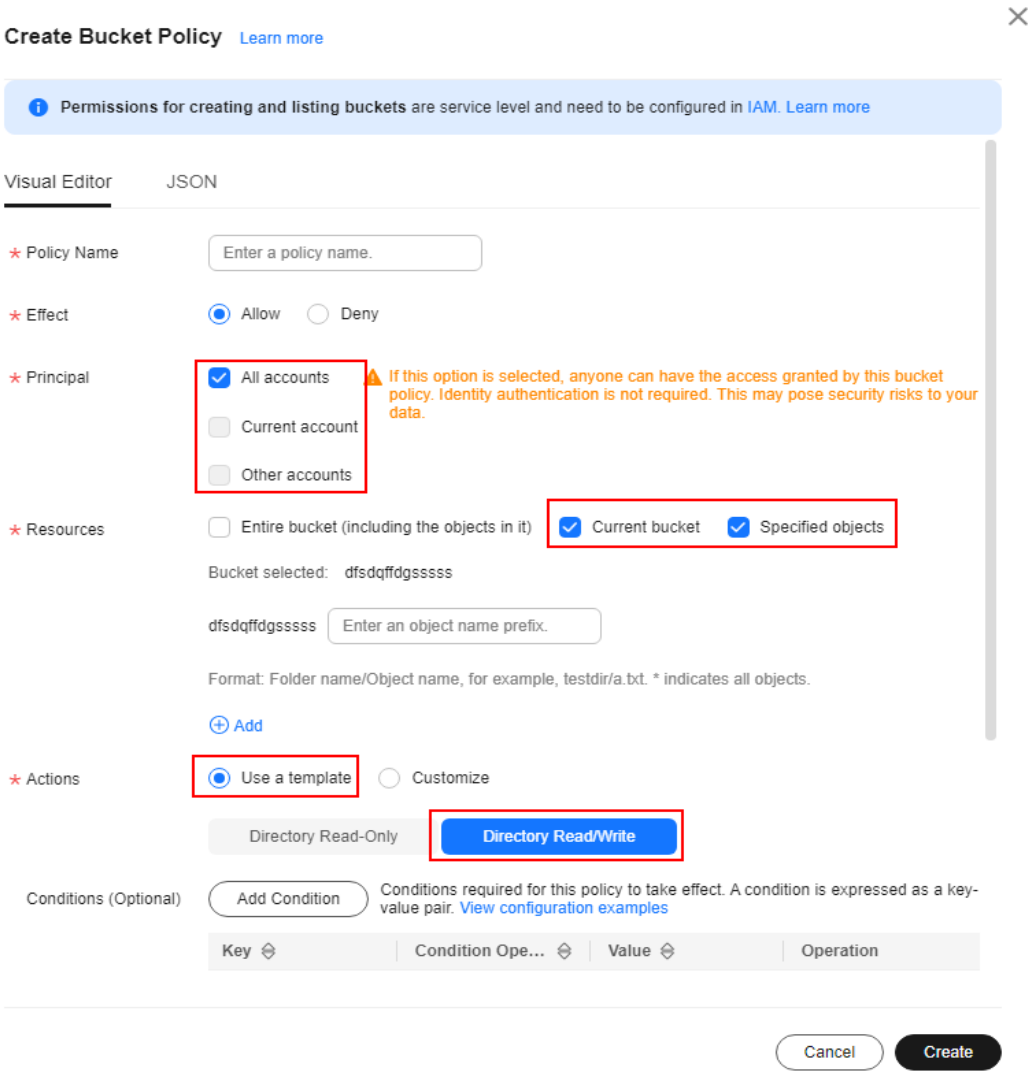

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Figure 5-8 Choosing the Object Read-Only template

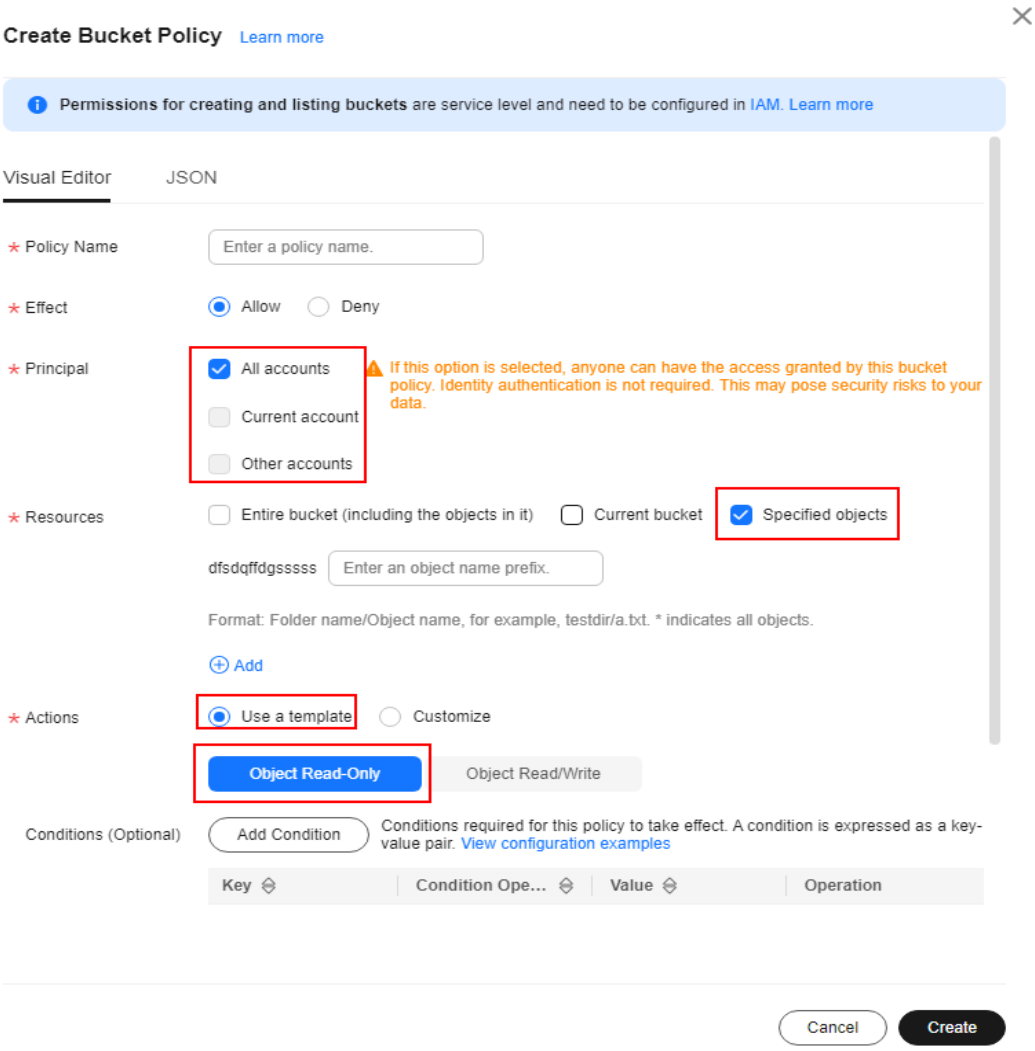

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Figure 5-9 Choosing the Object Read/Write template

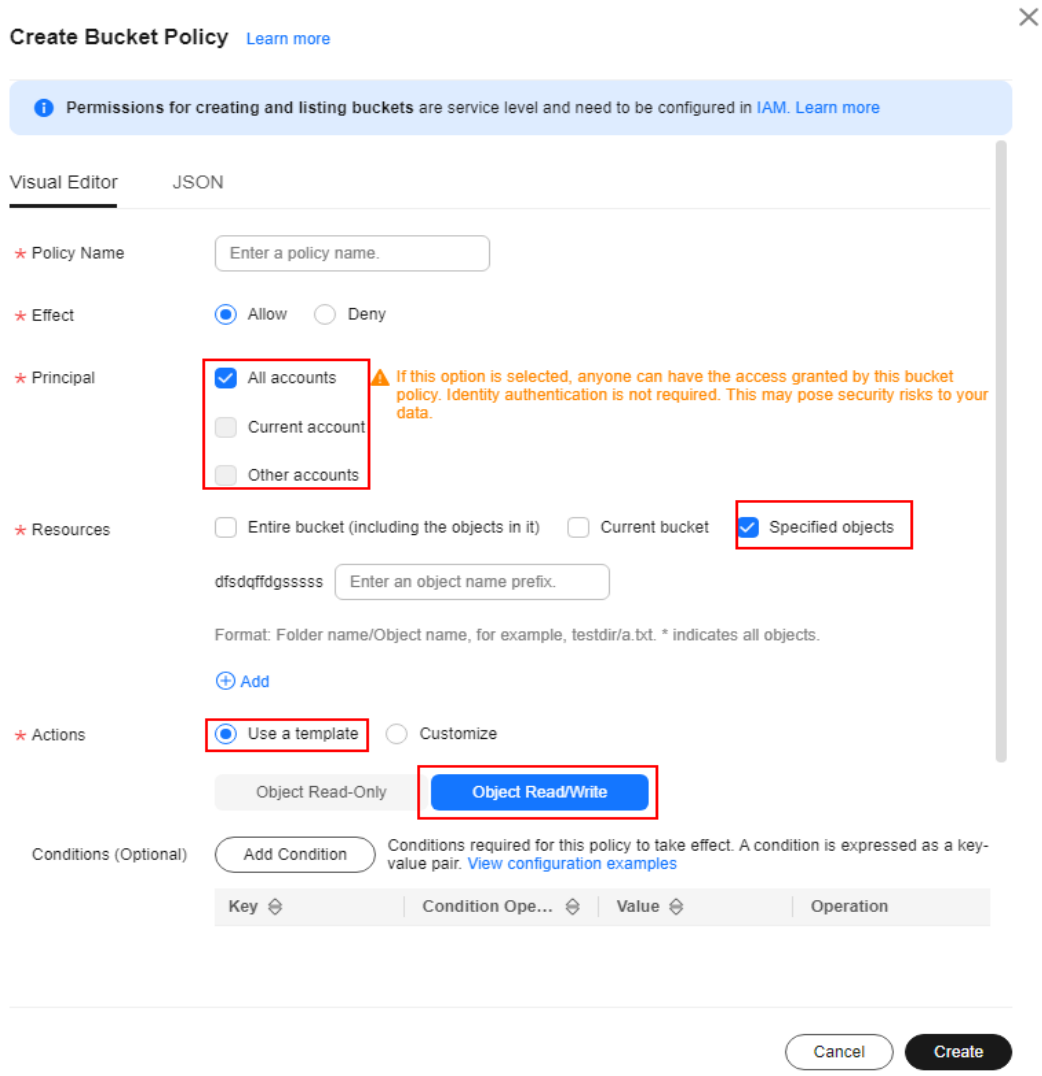

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Table 5-2 Bucket policy templates

Principal	Resource	Template	Actions Allowed	Advanced Settings
All accounts	Entire bucket (including the objects in it)	Public Read See **Figure 5-2**.	**Allows anonymous users to perform the following actions on a bucket and the objects in it:** HeadBucket (to check whether the bucket exists and obtain the bucket metadata) GetBucketLocation (to get the bucket location) GetObject (to obtain object content and metadata) RestoreObject (to restore Archive objects) GetObjectVersion (to obtain the content and metadata of a specified object version)	Excluding the specified actions is not allowed.

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Principal	Resource	Template	Actions Allowed	Advanced Settings
		Public Read/ Write See **Figure 5-3**.	**Allows anonymous users to perform the following actions on a bucket and the objects in it:** ListBucket (to list objects in the bucket and obtain the bucket metadata) ListBucketVersions (to list object versions in the bucket) HeadBucket (to check whether the bucket exists and obtain the bucket metadata) GetBucketLocation (to get the bucket location) PutObject (to upload objects using PUT and POST, upload parts, initiate multipart uploads, and assemble parts) GetObject (to obtain object content and metadata) ModifyObjectMetaData (to modify object metadata) ListBucketMultipartUploads (to list multipart uploads) ListMultipartUploadParts (to list uploaded parts) AbortMultipartUpload (to abort multipart uploads) RestoreObject (to restore Archive objects) GetObjectVersion (to obtain the content and metadata of a specified object version) PutObjectAcl (to configure the object ACL) GetObjectVersionAcl (to obtain the ACL of a specified object version) GetObjectAcl (to obtain the object ACL)	Excluding the specified actions is not allowed.

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Principal	Resource	Template	Actions Allowed	Advanced Settings
Current account/ Other accounts/ Delegated accounts	Entire bucket (including the objects in it)	Bucket Read-Only See **Figure 5-4**.	**Allows specified accounts to perform the following actions on a bucket and the objects in it:** Get* (all GET actions) List* (all LIST actions) HeadBucket (to check whether the bucket exists and obtain the bucket metadata)	Excluding the specified actions is not allowed.
		Bucket Read/ Write See **Figure 5-5**.	**Allows specified accounts to perform all actions excluding the following ones on a bucket and the objects in it:** DeleteBucket (to delete the bucket) PutBucketPolicy (to configure a bucket policy) PutBucketAcl (to configure the bucket ACL)	The specified actions are excluded.

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Principal	Resource	Template	Actions Allowed	Advanced Settings
All accounts/ Current account/ Other accounts/ Delegated accounts	Current bucket + Specified objects	Directory Read-Only See **Figure 5-6**.	**Allows all accounts or specified accounts to perform the following actions on the current bucket and the specified resources in it:** GetObject (to obtain object content and metadata) GetObjectVersion (to obtain the content and metadata of a specified object version) GetObjectVersionAcl (to obtain the ACL of a specified object version) GetObjectAcl (to obtain the object ACL) RestoreObject (to restore Archive objects) ListBucket (to list objects in the bucket and obtain the bucket metadata) ListBucketVersions (to list object versions in the bucket) HeadBucket (to check whether the bucket exists and obtain the bucket metadata) GetBucketLocation (to get the bucket location) **NOTE** If you apply the policy to **All accounts**, **ListBucket** and **ListBucketVersions** are not included in the template.	Excluding the specified actions is not allowed.

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Principal	Resource	Template	Actions Allowed	Advanced Settings
		Directory Read/Write See **Figure 5-7**.	**Allows all accounts or specified accounts to perform the following actions on the current bucket and the specified resources in it:** PutObject (to upload objects using PUT and POST, upload parts, initiate multipart uploads, and assemble parts) GetObject (to obtain object content and metadata) GetObjectVersion (to obtain the content and metadata of a specified object version) ModifyObjectMetaData (to modify object metadata) ListBucketMultipartUploads (to list multipart uploads) ListMultipartUploadParts (to list uploaded parts) AbortMultipartUpload (to abort multipart uploads) GetObjectVersionAcl (to obtain the ACL of a specified object version) GetObjectAcl (to obtain the object ACL) PutObjectAcl (to configure the object ACL) RestoreObject (to restore Archive objects) ListBucket (to list objects in the bucket and obtain the bucket metadata) ListBucketVersions (to list object versions in the bucket) HeadBucket (to check whether the bucket exists and obtain the bucket metadata) GetBucketLocation (to get the bucket location)	Excluding the specified actions is not allowed.

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Principal	Resource	Template	Actions Allowed	Advanced Settings
All accounts/ Current account/ Other accounts/ Delegated accounts	Specified objects	Object Read-Only See **Figure 5-8**.	**Allows all accounts or specified accounts to perform the following actions on specified resources in the bucket:** GetObject (to obtain object content and metadata) GetObjectVersion (to obtain the content and metadata of a specified object version) GetObjectVersionAcl (to obtain the ACL of a specified object version) GetObjectAcl (to obtain the object ACL) RestoreObject (to restore Archive objects)	Excluding the specified actions is not allowed.
		Object Read/ Write See **Figure 5-9**.	**Allows all accounts or specified accounts to perform the following actions on specified resources in the bucket:** PutObject (to upload objects using PUT and POST, upload parts, initiate multipart uploads, and assemble parts) GetObject (to obtain object content and metadata) GetObjectVersion (to obtain the content and metadata of a specified object version) ModifyObjectMetaData (to modify object metadata) ListMultipartUploadParts (to list uploaded parts) AbortMultipartUpload (to abort multipart uploads) GetObjectVersionAcl (to obtain the ACL of an object version) GetObjectAcl (to obtain the object ACL) PutObjectAcl (to configure the object ACL) RestoreObject (to restore Archive objects)	Excluding the specified actions is not allowed.

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Step 6 Complete the bucket policy configuration.

Some bucket policy templates require a configuration of principals or resources. You can also change the existing settings of a template, including the policy name, principals, resources, actions, and conditions. For details, see **Bucket Policy Parameters**.

Step 7 Click **Create** in the lower right corner.

----End

5.2.2 Creating a Custom Bucket Policy (Visual Editor)

You can customize bucket policies based on your needs. A custom bucket policy consists of five basic elements: effects, principals, resources, actions, and conditions. For details, see **Bucket Policy Parameters**.

Procedure

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Permissions** > **Bucket Policies**.

Step 4 Click **Create**.

Step 5 Configure a bucket policy.

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Figure 5-10 Configuring a bucket policy

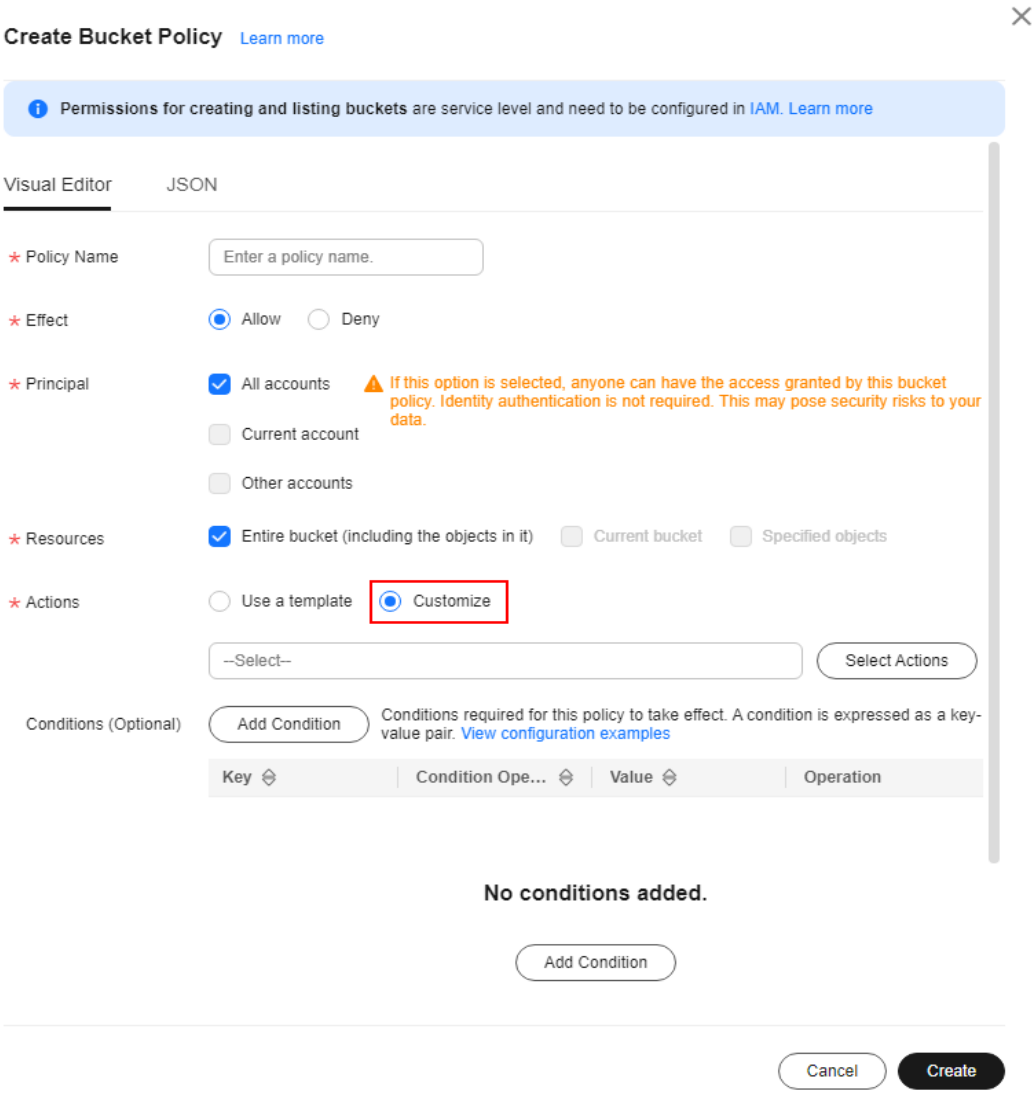

Table 5-3 Parameters for configuring a custom bucket policy

Parameter	Description
Configuration method	Visual editor or JSON. The visual editor is used here. For details about configurations in the JSON view, see **Creating a Custom Bucket Policy (JSON View)**.
Policy Name	Enter a bucket policy name.
Effect	• **Allow**: The policy allows the matched requests. • **Deny**: The policy denies the matched requests.

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Parameter	Description
Principal	• **All accounts**: The bucket policy applies to anonymous users. • **Current account**: Specify one or more IAM users under the current account. • **Other accounts**: Specify one or more accounts. **NOTE** The account ID and IAM user ID can be obtained from the **My Credentials** page. The format is *Account ID*/*IAM User ID*. To specify multiple accounts, enter each one on a separate line. *Account ID*/* indicates that permission is granted to all users under the account. • **Delegated accounts**: Delegated accounts can be added only after **Other accounts** is selected. **NOTE** The format is *Account ID/Agency Name*. To specify multiple agencies, enter each one on a separate line.
Resources	• **Entire bucket (including the objects in it)**: The policy applies to the bucket and the objects in it. You can configure bucket and object actions in this policy. • **Current bucket**: The policy applies to the current bucket. You can configure bucket actions in this policy. • **Specified objects**: The policy applies to specified objects in the bucket. You can configure object actions in this policy. **NOTE** – Multiple resource paths can be specified. – A resource path should be configured in the *Folder name*/*Object name* format, for example, **testdir/a.txt**. To specify the **testdir** folder and all objects in it, enter **testdir/***. – You can specify a specific object, an object set, or a directory. * indicates all objects in the bucket. To specify a specific object, enter the object name. To specify a set of objects, enter *Object name prefix**, **Object name suffix*, or *. For example, **testdir/*** indicates objects in the **testdir** folder, and **testprefix*** indicates objects whose prefix is **testprefix**.

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Parameter	Description
Actions	• **Actions**: Choose **Customize**. • **Select Actions**: See **Bucket Policy Parameters**. **NOTE** 1. If you select **Entire bucket (including the objects in it)** for **Resources**, common actions, bucket actions, and object actions will be available for you to choose from. 2. If you select **Current bucket** for **Resources**, common actions and bucket actions will be available for you to choose from. 3. If you select **Specified objects** for **Resources**, common actions and object actions will be available for you to choose from. 4. If you select both **Current bucket** and **Specified objects** for **Resources**, common actions, bucket actions, and object actions will be available for you to choose from.
Conditions (Optional)	• **Key**: See **Bucket Policy Parameters**. • **Conditional Operator**: See **Bucket Policy Parameters**. • **Value**: The entered value is associated with the key.
Advanced Settings > Exclude (Optional)	• **Specified principals**: By selecting this option, the bucket policy applies to users except the specified ones. **NOTE** – **Exclude** not selected: The bucket policy applies to the specified users. – **Exclude** selected: The bucket policy applies to users except the specified ones. • **Specified resources**: By selecting this option, the bucket policy applies to resources except the specified ones. **NOTE** – **Exclude** not selected: The bucket policy applies to the specified OBS resources. – **Exclude** selected: The bucket policy applies to OBS resources except the specified ones. • **Specified actions**: By selecting this option, the bucket policy applies to actions except the specified ones. For example, if you select **Allow** for **Effect**, **DeleteObject** for **Actions**, and **Specified actions** for **Exclude (Optional)**, all operations but not deleting objects are allowed. **NOTE** – **Exclude** not selected: The bucket policy applies to the specified actions. – **Exclude** selected: The bucket policy applies to actions except the specified ones. – By default, **Specified actions** is selected for **Exclude** in the bucket read/write template only. The action exclusion setting in bucket policy templates cannot be modified.

Step 6 Click **Create** in the lower right corner.

----End

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5.2.3 Creating a Custom Bucket Policy (JSON View)

If you are familiar with the JSON syntax and OBS bucket policies, you can code a bucket policy in the JSON view. There is no limit on the number of bucket policies (statements) for a bucket, but the JSON descriptions of all bucket policies in a bucket cannot exceed 20 KB in total.

Ways to Create a Custom Bucket Policy

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to create a bucket policy.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Permissions** > **Bucket Policies**.

Step 4 In the upper right corner of the page, click **JSON** and then **Edit**.

Step 5 Edit the bucket policy. Below gives a bucket policy example in JSON:

In the following example, configure the actual values for the parameters: *test-obs-policy* (the bucket policy name), *account ID* (the account ID), *User ID* (the IAM user ID), and *test-bucket/test.txt* (object *test.txt* in the *test-bucket* bucket). To obtain the account ID and IAM user ID, see **Obtaining Account, IAM User, Project, User Group, Region, and Agency Information**.

```
{
  "Statement":[
    {
      "Sid":"test-obs-policy",
      "Effect":"Allow",
      "Principal":{
        "ID":[
          "domain/account ID",
          "domain/account ID:user/User ID"
        ]
      },
      "Action":[
        "PutObject",
        "GetObject"
      ],
      "Resource":[
        "test-bucket/test.txt"
      ],
      "Condition":{
        "IpAddress":{
          "SourceIp": [
            "114.115.1.0/24"
          ]
        }
      }
    }
  ]
}
```

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Table 5-4 Parameters for creating a bucket policy in JSON

Parameter	Description
Sid	Bucket policy name
Effect	Effect of the bucket policy. For details, see **Bucket Policy Parameters**.

Principal	Users the bucket policy is applied to. You can obtain the user ID on the **My Credentials** page by logging in to the console as the user to be authorized. Principals should be configured as follows:
	• **domain/***Domain ID* (indicating that the principal is an account)
	• **domain/***Domain ID***:user/***User ID* (indicating that the principal is a user under an account)
	• To grant permissions to a federated user (that uses a SAML identity provider), you need to configure the principal in the following format. **domainIDxxx** indicates the account ID of the federated user. **provider-name** indicates the name of the user's identity provider.
	`"Principal": { "Federated": "domain/domainIDxxx:identity-provider/provider-name" }`
	• To grant permissions to a user group that a federated user (that uses a SAML identity provider) belongs to, you need to configure the principal in the following format. **groupname** indicates the name of the IAM user group that the federated user belongs to.
	`"Principal": { "Federated": "domain/domainIDxxx:group/groupname" }`

Action	Actions the bucket policy applies to. For details, see **Bucket Policy Parameters**.
Resource	Resources the bucket policy is applied to. For details, see **Bucket Policy Parameters**.
Condition	Conditions under which the bucket policy takes effect. For details, see **Bucket Policy Parameters**.

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Step 6 Click **Save**.

----End

Using APIs

- IAM Permissions Control
- Configuring a Bucket Policy

Using SDKs

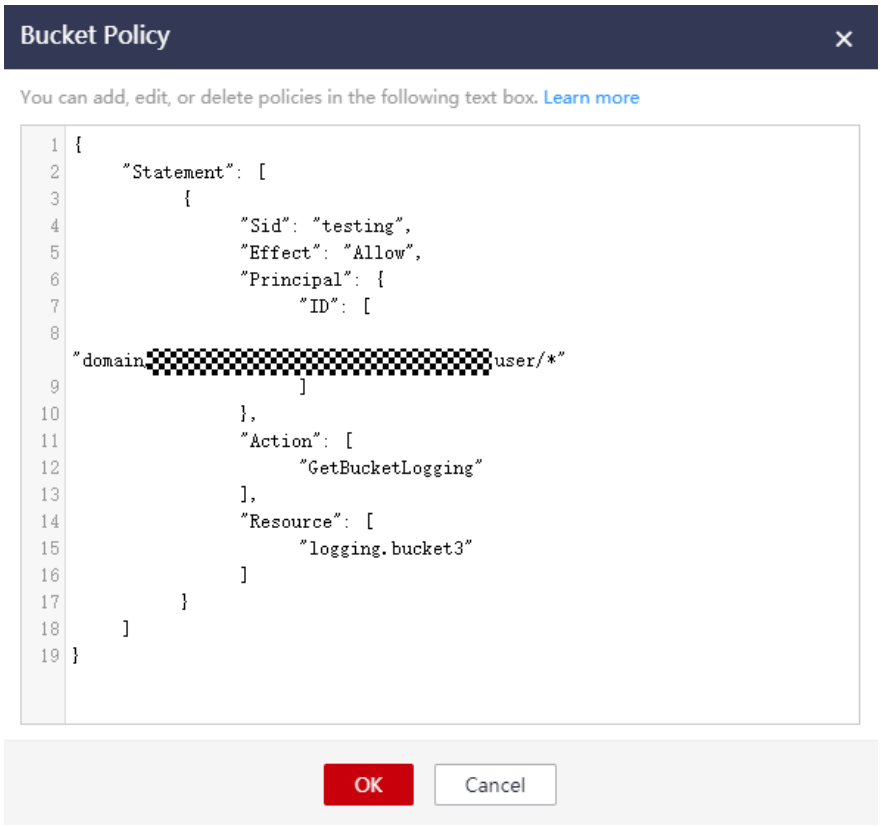
Java	Python	C: not supported	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Select the bucket you want and choose **More** > **Bucket Policy**. The window shown in **Figure 5-11** is displayed.

Figure 5-11 Configuring a bucket policy



Step 3 Enter a bucket policy in the following format.

1. Grant permissions to an account. In the following example, the account (whose account ID is **783fc6652cf246c096ea836694f71855**) is granted the

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permission required to obtain the log management information about bucket **logging.bucket3**.

```
{
   "Statement": [
      {
         "Sid": "testing",
         "Effect": "Allow",
         "Principal": {
            "ID": [
               "domain/783fc6652cf246c096ea836694f71855:user/*"
            ]
         },
         "Action": [
            "GetBucketLogging"
         ],
         "Resource": [
            "logging.bucket3"
         ]
      }
   ]
}
```

Table 5-5 describes the parameters that you need to manually modify in the example above:

Table 5-5 Parameter changes

Item to Modify	Description
GetBucketLogging	Value of the **Action** field that indicates all OBS-supported actions in the policy. The value is a case-insensitive string. The value can contain a wildcard character (*), for example, **"Action":["List*", "Get*"]**, to apply all actions to the resources. You need to change the value as needed. For the actions supported by OBS, see **Bucket Actions**.
Allow	Value of the **Effect** field that indicates whether the permission in the policy is allowed or denied. The value must be **Allow** or **Deny**.
logging.bucket3	The bucket on which the policy works. You can change the bucket name as needed.
783fc6652cf246c096ea836694f71855	ID of an account. You can change it as needed. You can obtain the account ID on the bucket's **Basic Information** page.

2. Grant permissions to an IAM user. In the following example, the user (whose ID is **71f3901173514e6988115ea2c26d1999**) under the account (whose ID is **219d520ceac84c5a98b237431a2cf4c2**) is assigned the permission required to set log management for bucket **logging.bucket3**.

```
{
   "Statement": [
      {
         "Sid": "testing",
         "Effect": "Allow",
         "Principal": {
```

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```
            "ID": [
                "domain/219d520ceac84c5a98b237431a2cf4c2:user/
71f3901173514e6988115ea2c26d1999"
            ]
        },
        "Action": [
            "PutBucketLogging"
        ],
        "Resource": [
            "logging.bucket3"
        ]
    }
  ]
}
```

Table 5-6 describes the parameters that you need to manually modify in the example above:

Table 5-6 Parameter changes

Item to Modify	Description
PutBucketLogging	Value of the **Action** field that indicates all OBS-supported actions in the policy. The value is a case-insensitive string. The value can contain a wildcard character (*), for example, **"Action":["List*", "Get*"]**, to apply all actions to the resources. You need to change the value as needed. For the actions supported by OBS, see **Bucket Actions**.
Allow	Value of the **Effect** field that indicates whether the permission in the policy is allowed or denied. The value must be **Allow** or **Deny**.
logging.bucket3	The bucket on which the policy works. You can change the bucket name as needed.
219d520ceac84c5a98b237431a2cf4c2	ID of an account. You can change it as needed. You can click ⓘ next to the target bucket to obtain the **Account ID** on the **Basic Information** page.
71f3901173514e6988115ea2c26d1999	ID of a user under the account. You can change it as needed. You can choose **My Credentials** from the username in the upper right corner of OBS Console to obtain the **IAM User ID**.

For details about bucket policy parameters, see **Bucket Policy Parameters**.

----End

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Using the CLI Tool - obsutil

Command Line Structure

- In Windows
  ```
  obsutil bucketpolicy obs://bucket -method=put -localfile=xxx [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
  ```
- In Linux or macOS
  ```
  ./obsutil bucketpolicy obs://bucket -method=put -localfile=xxx [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
  ```

Examples

- Take the Windows OS as an example. Run the **obsutil bucketpolicy obs://bucket -method=put -localfile=d:\temp\policy.json** command to set a bucket policy based on file **policy.json**.
  ```
  obsutil bucketpolicy obs://bucket -method=put -localfile=d:\temp\policy.json

  Start at 2024-09-30 07:59:28.8675681 +0000 UTC

  Put bucketPolicy succeed, requestId is [04050000016836C5DA6FB21F14A2A0C0]
  ```

Parameter Description

Parameter	Optional or Mandatory	Description
bucket	Mandatory	The bucket name
method	Mandatory	The method. Set this parameter to **put** when configuring a bucket policy.
localfile	Mandatory	The path of the local policy file to import
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

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5.2.4 Replicating Bucket Policies

Scenarios

OBS allows you to replicate the existing bucket policies to a new bucket. When replicating policies, OBS automatically replaces the bucket name in the source bucket policies with the destination bucket name, for the policies to apply to the destination bucket.

Constraints

- The policies replicated from a source bucket will not overwrite existing policies in the destination bucket.
- The source policies with the same name as those in the destination bucket will not be replicated.
- Both source and destination buckets must be of the 3.0 version.

Procedure

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

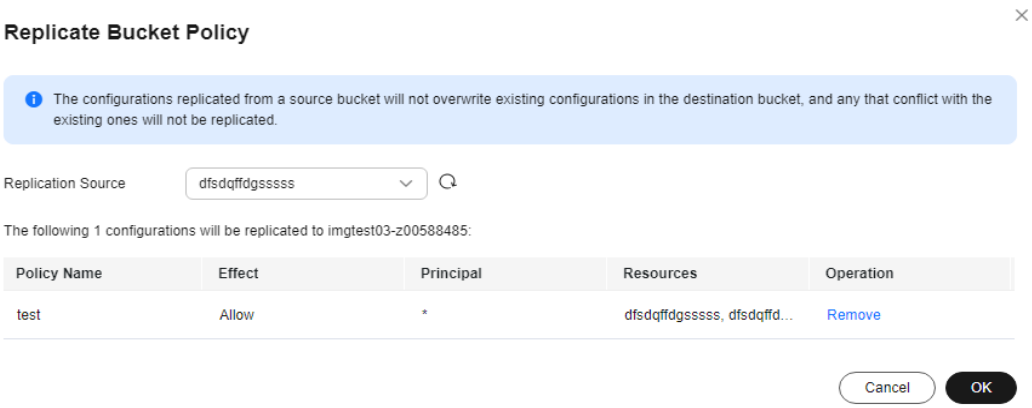
Step 3 In the navigation pane, choose **Permissions** > **Bucket Policies**.

Step 4 Click **Replicate**.

Step 5 Select a replication source, which is the bucket whose policies you want to replicate.

After you select a replication source, all bucket policies with different name from those in the destination bucket are displayed. You can remove any that are not required.

Figure 5-12 Replicating bucket policies



Step 6 Click **OK** to replicate the bucket policies to the destination bucket.

----End

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5.3 Configuring an Object Policy

Object policies are applied to the objects in a bucket. With an object policy, you can configure conditions and actions for objects in a bucket.

Procedure

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the row containing the object for which you want to configure a policy, choose **More** > **Configure Object Policy** in the **Operation** column. The **Configure Object Policy** page is displayed.

You can customize a policy or use a preset template to configure one as needed.

- **Using a preset template**: OBS presets object policy templates for multiple typical scenarios. You can use the templates to quickly configure object policies. For details about each template, see **Bucket Policy Parameters**.
- **Customizing a policy**: You can also customize an object policy based on your needs. A custom object policy consists of five basic elements: effects, principals, resources, actions, and conditions, similar to a bucket policy. For details, see **Bucket Policy Parameters**. The resource is the selected object and is automatically configured by the system. For details about how to customize an object policy, see **Creating a Custom Bucket Policy (Visual Editor)**. Different from customizing a bucket policy, to customize an object policy, you:
  a. Do not need to specify the resource.
  b. Can configure only object-related actions.

----End

5.4 Configuring a Bucket ACL

Prerequisites

You are the bucket owner or you have the permission to write the bucket ACL.

Ways to Configure a Bucket ACL

You can use **OBS Console**, APIs, SDKs, OBS Browser+, or obsutil to configure a bucket ACL.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

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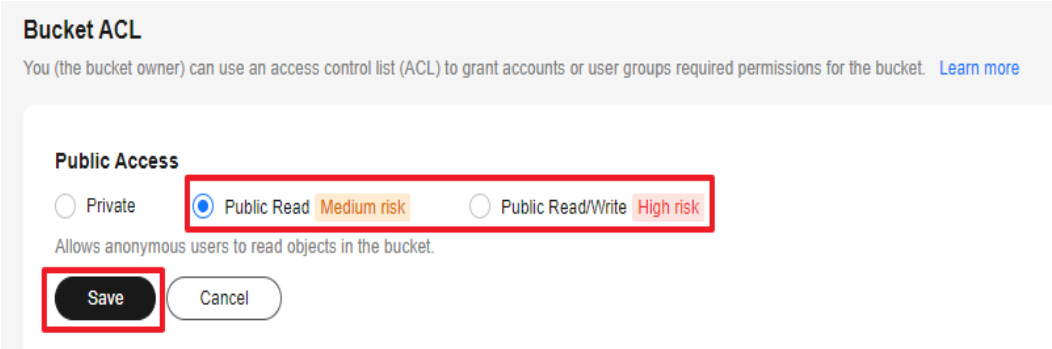
Step 3 In the navigation pane, choose **Permissions** > **Bucket ACL**.

Step 4 On the **Bucket ACL** page, choose **Private**, **Public Read**, or **Public Read/Write** to grant bucket ACL permissions for anonymous users.

NOTE

- After you change **Public Read** or **Public Read/Write** to **Private**, only the bucket owner or object owner has the access.
- After you change **Private** to **Public Read**, anyone can read objects in the bucket. No identity authentication is required.
- After you change **Private** to **Public Read/Write**, anyone can read, write, and delete objects in the bucket. No identity authentication is required.

Figure 5-13 Changing a public access permission



Step 5 In the **Operation** column, click **Edit** to grant the owner, anonymous user, or log delivery user required ACL permissions for the bucket.

Step 6 In the middle of the page, click **Export** to get the bucket ACL configuration. The file includes the user type, account, bucket access, and ACL access.

Step 7 In the middle of the page, click **Add** to apply specific ACL permissions to an account.

Enter an account ID and specify ACL permissions for the account. You can obtain the account ID from the **My Credentials** page.

Click **OK**.

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Figure 5-14 Granting permissions

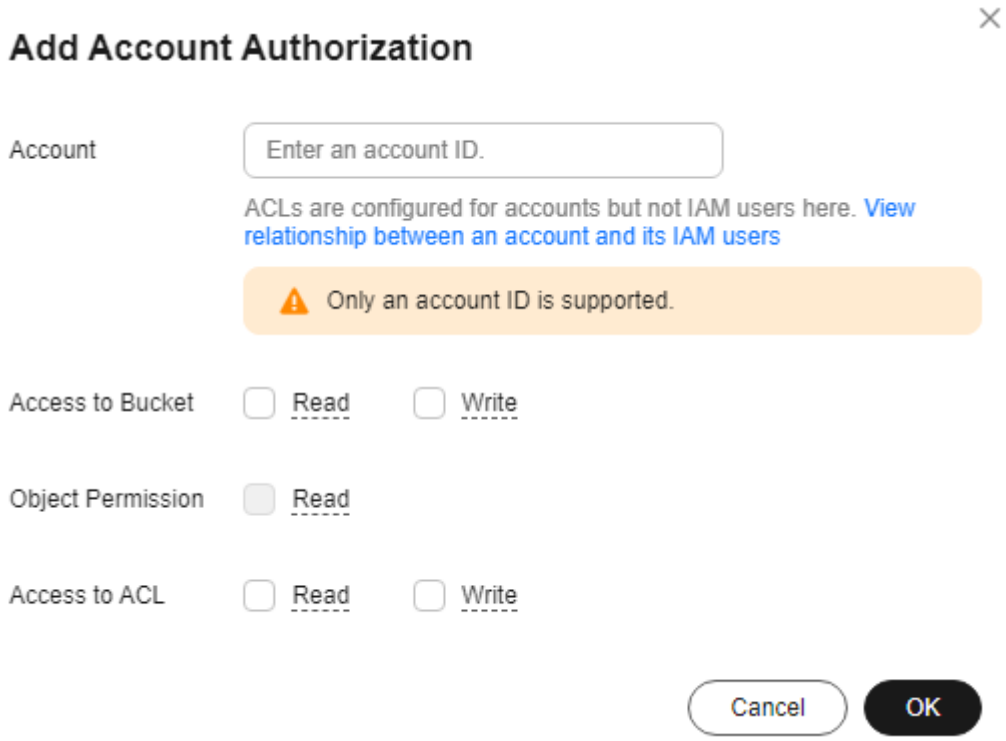

Table 5-7 Bucket access permissions

Permission	Description
Read	Grants the permission to obtain the list of objects in the bucket and the metadata of the bucket.
Write	Grants the permission to upload objects to the bucket and to delete and overwrite existing objects in the bucket.

Table 5-8 Object access permissions

Permission	Description
Object read	Grants the permission to obtain the content and metadata of objects in the bucket. The objects inherit the read permission configured for the bucket.

Table 5-9 ACL access permissions

Permission	Description
Read	Grants the permission to read the bucket ACL.

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Permission	Description
Write	Grants the permission to update the bucket ACL.

----End

Using APIs

Configuring a Bucket ACL

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

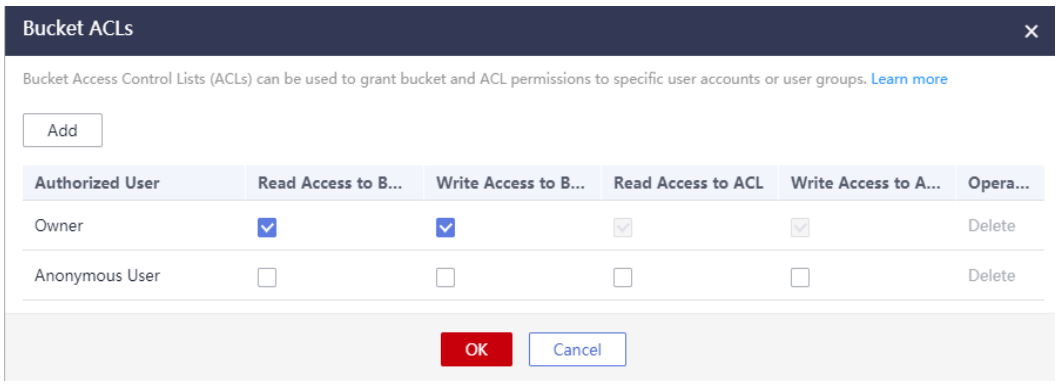
Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Select the bucket you want and click **Bucket ACLs**.

Step 3 Configure the bucket ACL as needed and click **OK**, as shown in **Figure 5-15**.

Figure 5-15 Configuring an ACL



If no ACL permissions are configured for a new bucket, OBS Browser+ automatically disables the access to the bucket and its objects by any other users except the bucket owner.

----End

Using the CLI Tool - obsutil

Command Line Structure

- In Windows

```
obsutil chattri obs://bucket [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

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- In Linux or macOS
  ```
  ./obsutil chattri obs://bucket [-sc=xxx] [-acl=xxx] [-aclXml=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
  ```

Examples

- Take the Windows OS as an example. Run the **obsutil chattri obs://bucket-test -acl=private** command to change the access control policy of the bucket to private read and write.
  ```
  obsutil chattri obs://bucket-test -acl=private

  Start at 2024-09-29 07:58:46.0506904 +0000 UTC

  Set the acl of bucket [bucket-test] to [private] successfully, request id [04050000016836C5DA6FB21F14A2A0C0]
  ```

Parameter Description

Parameter	Optional or Mandatory	Description
bucket	Mandatory	The bucket name
sc	Optional (additional parameter)	The default storage class of the bucket. Possible values are: • **standard**: Standard storage class. It features low access latency and high throughput, and is applicable to storing frequently accessed data (multiple accesses per month) or data that is smaller than 1 MB. • **warm**: Infrequent Access storage class. It is ideal for storing infrequently accessed (less than 12 times a year) data, but when needed, the access has to be fast. • **cold**: Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once a year) data. • **deep-archive**: Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely (once every few years) accessed. This storage class costs less than the Archive storage class, but takes longer time (usually several hours) to restore data. **NOTE** If the multi-AZ mode is enabled for a bucket, the default storage class of the bucket cannot be set to **cold**.

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Parameter	Optional or Mandatory	Description
acl	Optional (additional parameter)	The predefined access control policy of the bucket. Possible values are: • private • public-read • public-read-write **NOTE** The preceding three values indicate private read and write, public read, and public read and write.
aclXml	Optional (additional parameter)	The bucket's access control policy, in XML format <AccessControlPolicy> <Owner> <ID>*ownerid*</ID> </Owner> <AccessControlList> <Grant> <Grantee> <ID>*userid*</ID> </Grantee> <Permission>*[WRITE|WRITE_ACP|READ|READ_ACP|FULL_CONTROL]*</Permission> </Grant> <Grant> <Grantee> <Canned>Everyone</Canned> </Grantee> <Permission>*[WRITE|WRITE_ACP|READ|READ_ACP|FULL_CONTROL]*</Permission> </Grant> </AccessControlList> </AccessControlPolicy> **NOTE** • **Owner**: Optional. Specify the bucket owner's ID. • In **AccessControlList**, the **Grant** field contains the authorized users. **Grantee** specifies the IDs of authorized users. **Canned** specifies the authorized user group (currently, only **Everyone** is supported). • The following permissions can be granted: WRITE (write), WRITE_ACP (write ACL), READ (read), READ_ACP (read ACL), and FULL_CONTROL (full control). **NOTICE** Because angle brackets (<) and (>) are unavoidably included in the parameter value, you must use quotation marks to enclose them for escaping when running the command. Use single quotation marks for Linux or macOS and double quotation marks for Windows.

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Parameter	Optional or Mandatory	Description
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. For details about parameters that can be configured, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

NOTE

Only one from **sc**, **acl**, or **aclXml** can be set for each command.

Follow-up Procedure

After a specified account is granted the ACL permissions for a bucket, the authorized user can use the AK and SK to access that bucket by adding the bucket to OBS Browser+.

After certain permissions are granted to an anonymous user, the anonymous user can access the bucket without any authentication. The anonymous user can be either registered or non-registered. A registered anonymous user can use either of the methods above to access the bucket, while a non-registered anonymous user can access the bucket in any of the following ways:

- Access the bucket's domain name in a browser to view the objects in the bucket.
- Configure the bucket's domain name in a third-party system to directly connect to the bucket.

5.5 Configuring an Object ACL

Prerequisites

You are the object owner or you have the permission to write the object ACL.

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An object owner is the account that uploads the object, but may not be the owner of the bucket that stores the object. For example, account **B** is granted the permission to access a bucket of account **A**, and account **B** uploads a file to the bucket. In that case, account **B**, instead of the bucket owner account **A**, is the owner of the object. By default, account A is not allowed to access this object and cannot read or modify the object ACL.

Procedure

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

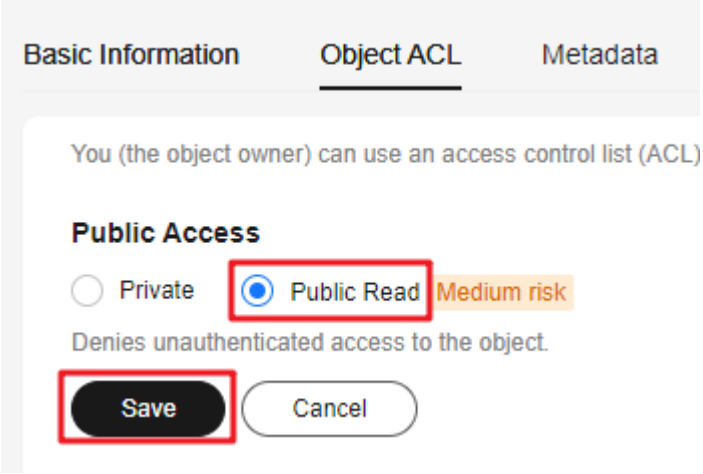
Step 3 Click a desired object.

Step 4 On the **Object ACL** page, choose a permission from **Private** and **Public Read** to grant object ACL permission for anonymous users.

NOTE

- After you change **Public Read** to **Private**, only the bucket owner or object owner has the access.
- After you change **Private** to **Public Read**, anyone can read the object content and metadata. No identity authentication is required.

Figure 5-16 Changing a public access permission



Step 5 Click **Edit** to grant the owner, anonymous user, or other accounts required permissions for the object.

NOTE

ACL permissions for encrypted objects cannot be granted to registered users or anonymous users.

Click **Export** to get the object ACL configuration. The file includes the user type, account, object access, and ACL access.

Click **Add** to apply specific ACL permissions to an account.

Enter an account ID and specify ACL permissions for the account. You can obtain the account ID from the **My Credentials** page.

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Click **OK**.

Figure 5-17 Granting permissions

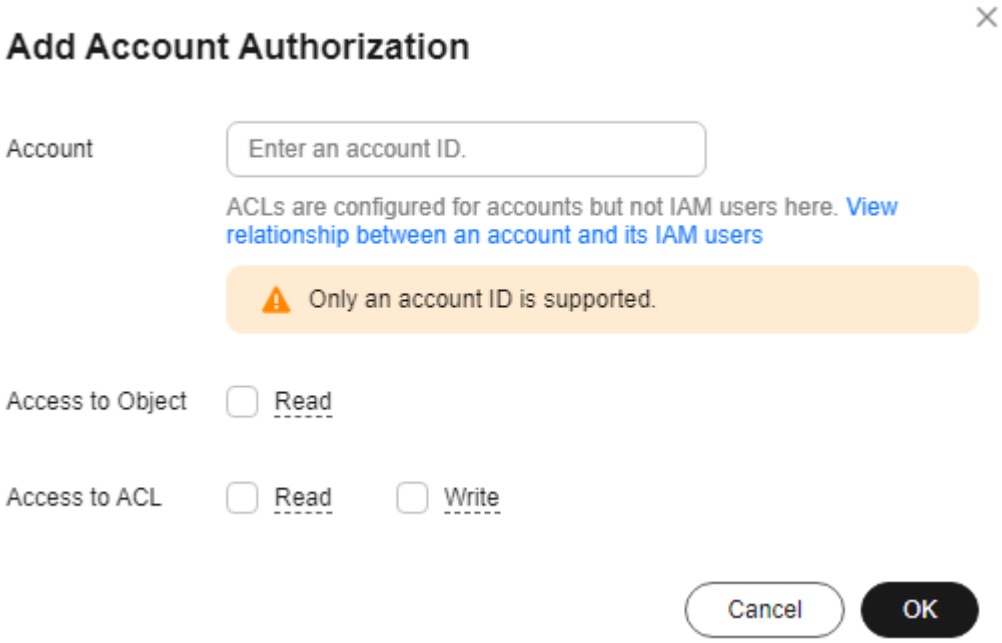

Table 5-10 Object access permissions

Permission	Description
Read	Grants the permission to obtain the content and metadata of the object.

Table 5-11 Object ACL access permissions

Permission	Description
Read	Grants the permission to read the object ACL.
Write	Grants the permission to update the object ACL.

----End

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6 Data Security

6.1 Server-Side Encryption

6.1.1 Server-Side Encryption Overview

Server-side encryption helps secure data stored in OBS and meet compliance requirements. It encrypts data at rest, storing data as ciphertext on physical storage media like hard disks. This ensures that even if the media is lost or accessed without authorization, the data remains protected. When the data is accessed, the OBS server decrypts it and then returns the plaintext data.

There are three OBS encryption methods: server-side encryption with KMS-managed keys (SSE-KMS), server-side encryption with OBS-managed keys (SSE-OBS), and server-side encryption with customer-provided keys (SSE-C).

Table 6-1 Three server-side encryption methods

Comparison Dimension	SSE-KMS	SSE-OBS	SSE-C
Scenarios	Scenarios that require high compliance and security. Keys are generated by third-party validated Hardware Secure Modules (HSMs). Access to keys is controlled and all operations involving keys are traceable by logs.	Scenarios that require basic encryption and batch processing. OBS does not need to interact with KMS. SSE-OBS features lower access latency and better performance than SSE-KMS.	Scenarios that users need to store and manage keys by themselves

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Comparison Dimension	SSE-KMS	SSE-OBS	SSE-C
Key management	KMS generates and keeps keys, and OBS uses the keys to encrypt objects.	OBS generates and keeps keys, and uses the keys to encrypt objects.	A user generates and keeps keys, and OBS uses the keys to encrypt objects.
Encryption algorithm	AES-256 and SM4	AES-256	AES-256
Encryption scope	Bucket level and object level	Bucket level and object level	Object level
Details	See **SSE-KMS**.	See **SSE-OBS**.	See **SSE-C**.

NOTE

- You can check **OBS Console** to see if SSE-KMS is available in a given region. If you want to use the SM4 encryption algorithm when enabling SSE-KMS, choose the CN North-Ulanqab1 region.
- SSE-OBS is available on the entire Huawei Cloud Chinese Mainland website.
- SSE-C is available in the regions where the SSE-C API is supported.

Constraints

- Only one encryption method can be used each time an object is uploaded. The encryption configuration of an uploaded object cannot be changed.
- To use SSE-KMS to encrypt a bucket or the objects in it, you must have **kms:cmk:get**, **kms:cmk:list**, **kms:cmk:create**, **kms:dek:create**, and **kms:dek:crypto** permissions granted by using IAM, so that you can upload objects to or download objects from this bucket.
- If server-side encryption is disabled for a bucket, the encrypted objects can only be accessed over HTTPS.
- A key in use cannot be deleted, or the object encrypted with this key cannot be downloaded.

Bucket-Level and Object-Level Server-Side Encryption

The following table compares bucket-level and object-level server-side encryption.

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Table 6-2 Comparison between bucket-level and object-level server-side encryption

Item	Bucket-Level Encryption	Object-Level Encryption
Scenarios	You need to encrypt all objects when they are uploaded to a bucket.	You need to encrypt only some objects or select an encryption method and key each time you upload an object.
Encryption methods	SSE-KMS and SSE-OBS	SSE-KMS, SSE-OBS, and SSE-C
Configuration	You can change your encryption configuration at any time.	You can configure encryption during object upload and the configuration cannot be changed after the upload.
Impacts	• If encryption is not enabled for a bucket, you can separately configure encryption when uploading objects to the bucket. • If encryption is enabled for a bucket, OBS only encrypts the objects uploaded after encryption is enabled, and does not encrypt those uploaded before. When you upload objects to this bucket, they will inherit the bucket's encryption by default, but you can change the configuration if needed. • If you change the encryption configuration for a bucket, only the objects uploaded after the change will inherit the new configuration. Objects uploaded before the change will retain the original configuration. • Disabling encryption for a bucket does not change the encryption status of existing objects in the bucket. However, objects uploaded later will not be forcibly encrypted. If necessary, you can manually encrypt subsequent objects when you upload them to the bucket.	

References

- You can use Cloud Trace Service (CTS) to monitor bucket encryption operations, including **setBucketEncryption** (which configures server-side encryption for a bucket) and **deleteBucketEncryption** (which deletes the bucket's server-side encryption settings). For more information, see **Using CTS to Audit OBS**.
- You can enable logging for OBS to automatically log bucket encryption operations, including **REST.PUT.ENCRYPTION** (which configures encryption for a bucket), **REST.GET.ENCRYPTION** (which obtains the bucket's encryption settings), and **REST.DELETE.ENCRYPTION** (which deletes the bucket's encryption settings). OBS writes the generated log files to the specified bucket. For more information, see **Using Logging to Record OBS Logs**.

6.1.2 SSE-KMS

SSE-KMS combines KMS and OBS to improve security and meet compliance requirements. KMS provides keys, and OBS uses the keys to encrypt data uploaded

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to it. These keys are generated by third-party validated Hardware Secure Modules (HSMs). Access to the keys is controlled, and all key-related operations are logged for auditing. You can also use KMS to manage keys, such as creating custom keys, as well as editing, querying, and deleting keys.

Context

Before using SSE-KMS, you may want to know:

- **Key Management Service (KMS)**: It is a secure, reliable, and easy-to-use key hosting service provided by Huawei Cloud. You can use KMS to create and manage keys. The created keys can be used for server-side encryption. For more information, see **KMS Overview**.
- **Customer Master Key (CMK)**: CMKs are top-level keys in KMS. They are used to create and manage other keys (including session keys and data encryption keys). CMKs fall into **custom keys** and **default keys**. You can use either of them for SSE-KMS. If you do not specify a key, OBS creates a default key for your account the first time you use SSE-KMS. For more information, see **KMS Basic Concepts**, **How Are Default Keys Generated? What Are the Differences Between a Custom Key and a Default Key?** and **Creating a Custom Key**.
- **Data Encryption Key (DEK)**: DEKs are used to encrypt data. For more information, see **How Do I Use a DEK?**
- **Envelope encryption**: Instead of encrypting and decrypting data directly with a CMK, envelope encryption uses the CMK to generate a DEK to encrypt and decrypt data, and uses the CMK to encrypt and decrypt the DEK. For more information, see **What Are the Benefits of Envelope Encryption?**

Billing

You will be billed for using KMS keys. For details, see **KMS Billing Items**.

Important Notes

- Data Encryption Workshop (DEW) APIs have traffic control limits (see **DEW API Overview**). After SSE-KMS is enabled, your service access may be affected by traffic control.
- The ETag value of an encrypted object is the MD5 value of the ciphertext, rather than that of the plaintext.

Constraints

- SSE-KMS supports the **AES-256** and **SM4** algorithms.
- HTTPS is required for requests that configure SSE-KMS for buckets, as well as for all GET and PUT requests that use SSE-KMS.
- To access objects encrypted using SSE-KMS, anonymous users must use valid credentials (permanent or temporary access keys) to sign requests. For details, see **OBS Signatures**.
- To use a custom customer master key (CMK), the bucket with SSE-KMS enabled must be in the same region as the CMK. The default key is not region-specific or IAM user-specific. All IAM users under a HUAWEI ID share the same default key in all regions.

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- **Custom CMKs** only support the **AES-256** and **SM4** algorithms.
- For cross-account access, use **custom keys** for SSE-KMS.

How SSE-KMS Works

Figure 6-1 SSE-KMS encryption process

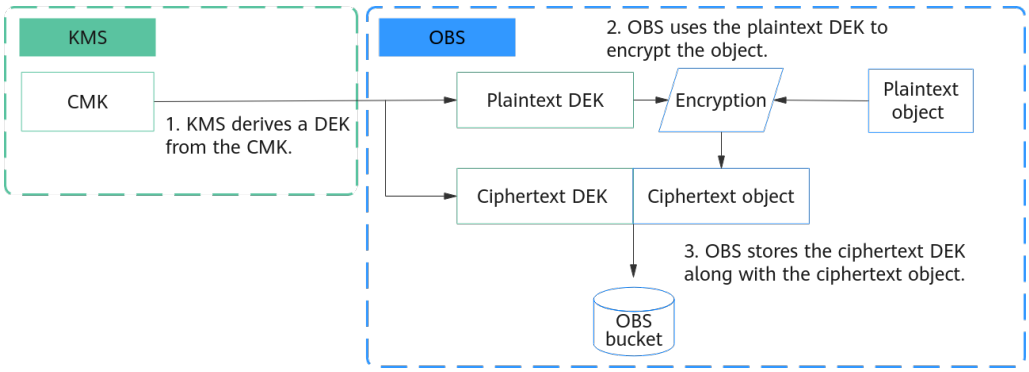

Figure 6-1 shows how SSE-KMS encryption works with **envelope encryption**:

1. KMS derives a **DEK** from a **CMK**, uses the CMK to encrypt the DEK, and sends both the plaintext and ciphertext of the DEK to OBS.
2. OBS uses the plaintext DEK to encrypt data and then promptly deletes the plaintext DEK from memory.
3. OBS stores the ciphertext DEK as metadata along with the ciphertext object.

Figure 6-2 SSE-KMS decryption process

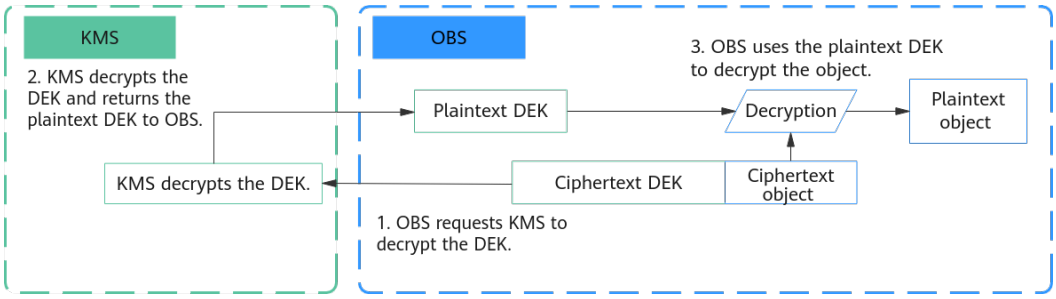

Figure 6-2 shows how SSE-KMS decryption works:

1. OBS requests KMS to decrypt the ciphertext DEK.
2. KMS uses the CMK used during encryption to decrypt the DEK and returns the DEK plaintext to OBS.
3. OBS uses the plaintext DEK to decrypt the ciphertext object, obtains the plaintext object, and then promptly deletes the plaintext DEK from memory.

Permissions Configuration

To configure encryption for a bucket or an object you are uploading and to download encrypted objects, you must have the required permissions:

- To set a bucket's encryption method to SSE-KMS, you must be the bucket owner or have the required permissions

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(**obs:bucket:PutEncryptionConfiguration** and **obs:bucket:GetEncryptionConfiguration** in IAM or **PutEncryptionConfiguration** and **GetEncryptionConfiguration** in a bucket policy). For details, see **OBS Permissions Control Overview**, **IAM Custom Policies**, and **Creating a Custom Bucket Policy**.

- To use SSE-KMS to encrypt the object you are uploading, you must have the upload permission and the **kms:cmk:get**, **kms:cmk:list**, **kms:cmk:create**, and **kms:dek:create** permissions granted using IAM.
- To download objects encrypted using SSE-KMS, you must have the download permission and the **kms:cmk:get**, **kms:cmk:list**, **kms:cmk:create**, **kms:dek:create**, and **kms:dek:crypto** permissions granted using IAM.

Enforce a specific server-side encryption method for objects uploaded to a bucket:

- You can configure a bucket policy to enforce a specific server-side encryption method for objects uploaded to that bucket. For example, to ensure that objects uploaded to bucket **ExampleBucket** via PUT are encrypted using SSE-KMS, you can configure a bucket policy that denies any upload requests lacking the **x-obs-server-side-encryption:"kms"** header:

```
{
   "Statement": [
      {
         "Sid": "DenyUnEncryptedObjectUploads",
         "Effect": "Deny",
         "Principal": "*",
         "Action": "PutObject",
         "Resource": "ExampleBucket/*",
         "Condition": {
            "StringNotEquals": {
               "x-obs-server-side-encryption": "kms"
            }
         }
      }
   ]
}
```

- **Authorize an account to access objects encrypted using server-side encryption in another account**:

  Assume that HUAWEI ID **A** uses its own key **k** to encrypt object **a** in bucket **A**. To access object **a**, HUAWEI ID **B** needs to be granted the permissions for the bucket, object, as well as the key:

  - **Bucket and object authorization**: ID **A** authorizes ID **B** to access the bucket. For details, see **Granting Permissions to Other Accounts**.
  - **Key authorization**: ID **A** authorizes ID **B** to access key **k**. For details, see **Creating a Grant for a Custom Key**.

  For cross-account access, use **custom keys** for SSE-KMS.

Impacts of Server-Side Encryption on Other Operations

Object uploads and downloads

As long as your **permissions are properly configured**, there is no difference in how you access encrypted and unencrypted objects. For example, if you use a pre-signed URL to share your object, anyone with the shared URL can access your object, regardless of whether it is encrypted. This means that the encryption status

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does not affect how the URL works. In addition, when you list objects in a bucket, the API returns all objects, regardless of whether they are encrypted.

Object replication (within a region and across regions)

- If the destination bucket has server-side encryption enabled but the source bucket does not, the destination bucket's encryption method applies to the object copies. In this case, a source object and its copy have different ETags. If your application relies on ETags, make sure it accounts for this difference.
- If both the source and destination buckets have server-side encryption enabled but use different encryption methods, the destination bucket's encryption method applies to the object copies. In this case, a source object and its copy have different ETags. Make sure your application accounts for this difference.
- If the source bucket has server-side encryption enabled but the destination bucket does not, the source bucket's encryption method applies to the object copies.

Prerequisites

If you plan to use a custom CMK, create one before configuring SSE-KMS. For details, see **Creating a Custom Key**.

Configuring SSE-KMS for a Bucket

You can use **OBS Console**, APIs, or SDKs to configure SSE-KMS for a bucket.

Using OBS Console

The following describes how to enable server-side encryption for an existing bucket. To enable server-side encryption when creating a bucket, see **Creating a Bucket**.

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Overview**.

Step 4 In the **Basic Configurations** area, click **Server-Side Encryption**. The **Server-Side Encryption** dialog box is displayed.

Step 5 Click **OK**.

----End

Using APIs

Configuring Bucket Encryption

For more information, see **Overview of Server-Side Encryption APIs**.

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Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Configuring SSE-KMS for an Object

You can use **OBS Console**, APIs, or SDKs to configure SSE-KMS for an object.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Click **Upload Object**. The **Upload Object** dialog box is displayed.

Step 4 Add the file to be uploaded.

Step 5 (Optional) Enable server-side encryption if it is not enabled for your bucket.

Step 6 Choose an encryption method.

Table 6-3 Encryption methods

Encryption Method	Description
Inherit from bucket	The object will inherit the encryption settings of the bucket. If SSE-KMS is used for the bucket and you want to apply SSE-KMS and the key used for the bucket to the object, choose this option. Then, go to **Step 7**.
SSE-KMS	After selecting **SSE-KMS**, you can specify an encryption algorithm, encryption key type, and encryption key.
SSE-OBS	If you use **SSE-OBS**, no other settings are required. For more information, see **SSE-OBS**.

Step 7 Click **OK**.

After the object is uploaded, you can view its encryption status on its details page.

----End

Using APIs

See **Overview of Server-Side Encryption APIs**.

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Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Changing the Encryption Status of an Existing Object

By **copying an existing object to itself**, you can apply encryption or change its encryption method.

You can use APIs and SDKs to change an object's encryption settings.

Using APIs

Copying an Object

For more information, see **Overview of Server-Side Encryption APIs**.

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Should I Use a Default or Custom CMK?

You should use **the default CMK** if:

- You (an IAM user) who uploads or downloads objects and the default CMK belong to the same HUAWEI ID.
- You do not want to manage CMKs.

You should use **a custom CMK** if:

- You want to create, rotate, or disable CMKs or define CMK access control.
- You want other accounts to access OBS objects. In this case, you need to grant these accounts the access to the custom CMK.

6.1.3 SSE-OBS

SSE-OBS does not need to interact with KMS, thereby having lower access latency and better performance than SSE-KMS. SSE-OBS is ideal for scenarios that require basic or batch encryption.

Billing

You are not billed for using SSE-OBS. However, requests for configuring SSE-OBS for buckets or objects will incur costs.

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Important Notes

The ETag value of an encrypted object is the MD5 value of the ciphertext, rather than that of the plaintext.

Constraints

SSE-OBS only supports the **AES-256** algorithm.

How SSE-OBS Works

Figure 6-3 SSE-OBS encryption process

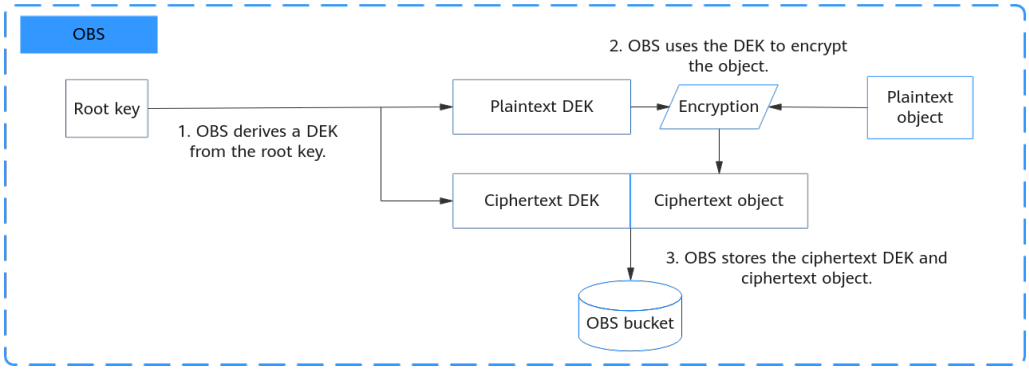

Figure 6-3 shows how SSE-OBS works with **envelope encryption**:

1. OBS derives the plaintext DEK from the system root key, and then encrypts the plaintext DEK to obtain the ciphertext DEK.
2. OBS uses the plaintext DEK to encrypt data and then promptly deletes the plaintext DEK from memory.
3. OBS stores the ciphertext DEK as metadata along with the ciphertext object.

Figure 6-4 SSE-OBS decryption process

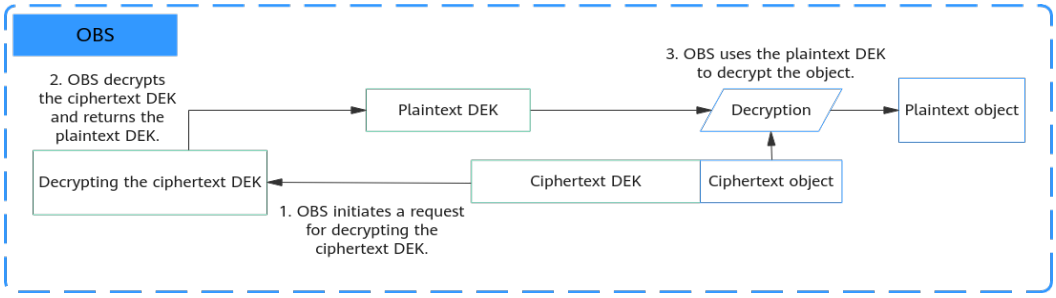

Figure 6-4 shows how SSE-OBS decryption works:

1. When an object is downloaded, OBS initiates a request for decrypting the ciphertext DEK.
2. OBS decrypts the ciphertext DEK and returns the plaintext DEK.
3. OBS uses the plaintext DEK to decrypt the ciphertext object, obtains the plaintext object, and then promptly deletes the plaintext DEK from memory.

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Permissions Configuration

- To set a bucket's encryption method to SSE-OBS, you must be the bucket owner or have the required permissions (**obs:bucket:PutEncryptionConfiguration** and **obs:bucket:GetEncryptionConfiguration** in IAM or **PutEncryptionConfiguration** and **GetEncryptionConfiguration** in a bucket policy). For details, see **OBS Permissions Control Overview**, **IAM Custom Policies**, and **Creating a Custom Bucket Policy**.
- To use SSE-OBS to encrypt the object you are uploading, you must have the upload permission (**obs:object:PutObject** in IAM or **PutObject** in a bucket policy).
- To download objects encrypted using SSE-OBS, you must have the download permission (**obs:object:GetObject** in IAM or **GetObject** in a bucket policy).
- You can configure a bucket policy to enforce a specific server-side encryption method for objects uploaded to that bucket. For example, to deny any object upload requests that do not include the **x-obs-server-side-encryption:"AES256"** header for SSE-OBS, you can configure a bucket policy as follows:

```
{
   "Statement": [
      {
         "Sid": "DenyUnEncryptedObjectUploads",
         "Effect": "Deny",
         "Principal": "*",
         "Action": "PutObject",
         "Resource": "YourBucket/*",
         "Condition": {
            "StringNotEquals": {
               "x-obs-server-side-encryption": "AES256"
            }
         }
      }
   ]
}
```

Configuring SSE-OBS for a Bucket

You can use **OBS Console**, APIs, or SDKs to configure SSE-OBS for a bucket.

Using OBS Console

The following describes how to enable server-side encryption for an existing bucket. To enable server-side encryption when creating a bucket, see **Creating a Bucket**.

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Overview**.

Step 4 In the **Basic Configurations** area, click **Server-Side Encryption**. The **Server-Side Encryption** dialog box is displayed.

Step 5 Enable server-side encryption.

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Step 6 Choose **SSE-OBS** for **Encryption Method**.

Step 7 Click **OK**.

----End

Using APIs

Configuring Bucket Encryption

For more information, see **Overview of Server-Side Encryption APIs**.

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Configuring SSE-OBS for an Object

You can use **OBS Console**, APIs, or SDKs to configure SSE-OBS for an object.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Click **Upload Object**. The **Upload Object** dialog box is displayed.

Step 4 Add the file to be uploaded.

Step 5 Choose **SSE-OBS** for **Encryption Method**.

Step 6 Click **OK**.

After the object is uploaded, you can view its encryption status on its details page.

----End

Using APIs

See **Overview of Server-Side Encryption APIs**.

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

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References

By **copying an existing object to itself**, you can apply encryption or change its encryption method. For details, see **Changing the Encryption Status of an Existing Object**.

6.1.4 SSE-C

SSE-C is recommended if you want to store and manage keys by yourself.

Billing

You are not billed for using SSE-C. However, requests for configuring SSE-C for objects will incur costs.

Important Notes

- Requests for SSE-C must be sent over **HTTPS** to enhance the security of your keys. OBS denies SSE-C-related requests that are not sent over HTTPS.
- OBS does not store your keys. If you lose your keys, you may lose the objects encrypted with them.
- The ETag value of an encrypted object is the MD5 value of the ciphertext, rather than that of the plaintext.
- You need to keep track of which key goes with which object or object version, since each version may be encrypted using a different key.
- You are advised to take necessary measures to protect your keys on the client, such as key rotation, to ensure data security.

Constraints

- SSE-C only supports the **AES-256** algorithm.
- SSE-C can be configured for **objects** only.
- When uploading an object using multipart upload, you must include the key in the requests for **initiating the multipart upload**, **uploading parts**, and **copying parts**. All operations within the same multipart upload must use the same key. **The key is not required for completing the multipart upload.** The complete object is encrypted using SSE-C.

How SSE-C Works

Figure 6-5 SSE-C encryption process

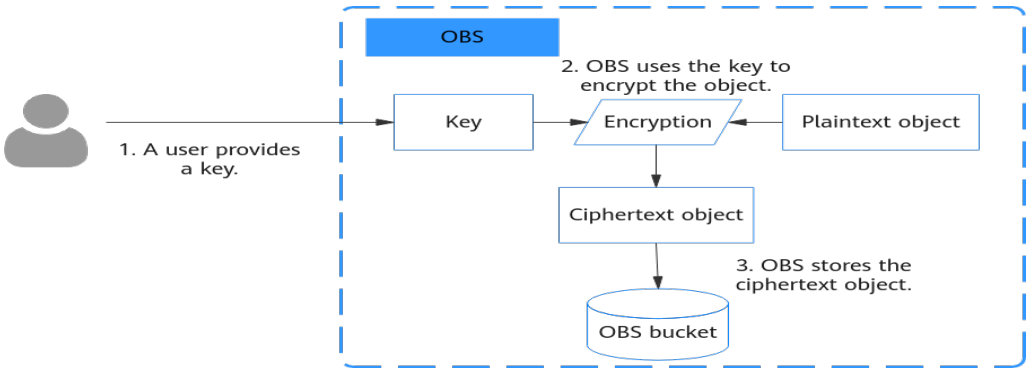

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Figure 6-5 shows how SSE-C encryption works:

1. A user sends the key to OBS when making an API call.
2. OBS uses the key to encrypt the object and then deletes the key from memory.
3. OBS stores the encrypted object.

Figure 6-6 SSE-C decryption process

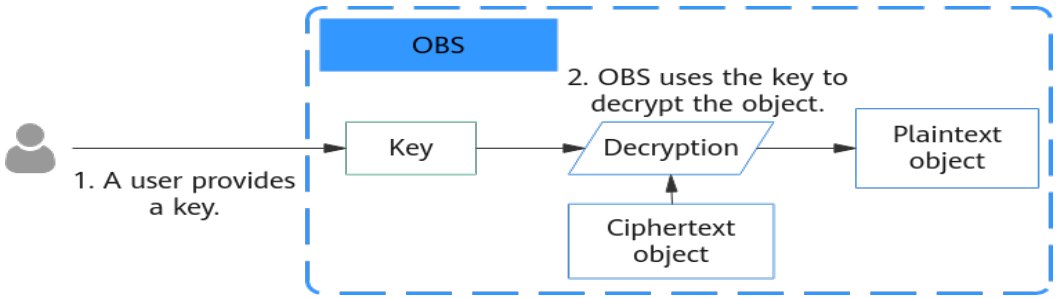

Figure 6-6 shows how SSE-C decryption works:

1. When downloading an object, a user sends the key to OBS when making an API call.
2. OBS uses the key to decrypt the object, obtains the plaintext object, and then deletes the key from memory.

Permissions Configuration

- To set a bucket's encryption method to SSE-C, you must be the bucket owner or have the required permissions (**obs:bucket:PutEncryptionConfiguration** and **obs:bucket:GetEncryptionConfiguration** in IAM or **PutEncryptionConfiguration** and **GetEncryptionConfiguration** in a bucket policy). For details, see **OBS Permissions Control Overview**, **IAM Custom Policies**, and **Creating a Custom Bucket Policy**.
- To use SSE-C to encrypt the object you are uploading, you must have the upload permission (**obs:object:PutObject** in IAM or **PutObject** in a bucket policy).
- To download objects encrypted using SSE-C, you must have the download permission (**obs:object:GetObject** in IAM or **GetObject** in a bucket policy).
- You can configure a bucket policy to enforce a specific server-side encryption method for objects uploaded to that bucket. For example, to ensure that objects uploaded to bucket **ExampleBucket** via PUT are encrypted using SSE-C, you can configure a bucket policy that denies any upload requests lacking the **x-obs-server-side-encryption-customer-algorithm:"AES256"** header:

```
{
    "Statement": [
        {
            "Sid": "DenyUnEncryptedObjectUploads",
            "Effect": "Deny",
            "Principal": "*",
            "Action": "PutObject",
            "Resource": "ExampleBucket/*",
            "Condition": {
                "StringNotEquals": {
                    "x-obs-server-side-encryption-customer-algorithm": "AES256"
```

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```
        }
      }
    }
  ]
}
```

Configuring SSE-C for an Object

You can use APIs or SDKs to configure SSE-C for an object.

Using APIs

See **Overview of Server-Side Encryption APIs**.

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Related Operations

By **copying an existing object to itself**, you can apply encryption or change its encryption method. For details, see **Changing the Encryption Status of an Existing Object**.

6.1.5 Overview of Server-Side Encryption APIs

You can use APIs to configure encryption for existing buckets, as well as obtain and delete encryption configuration of existing buckets. For details, see **Configuring Bucket Encryption**, **Obtaining Bucket Encryption Configuration**, and **Deleting the Encryption Configuration of a Bucket**.

You can also configure encryption in the APIs for creating a bucket, uploading, downloading, and copying an object, as well as uploading an object in a multipart upload. The following table lists these APIs and parameters involved.

Table 6-4 Server-side encryption APIs and parameters

Type	Header	Description	API for Creating a Bucket	API for Uploading an Object - PUT	API for Uploading an Object - POST
Request headers	x-obs-server-side-encryption	Specifies the encryption method.	**kms**: SSE-KMS is used for encryption. **obs**: SSE-OBS is used for encryption.	**kms**: SSE-KMS is used for encryption. **AES256**: SSE-OBS and the AES-256 algorithm are used.	

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Type	Header	Description	API for Creating a Bucket	API for Uploading an Object - PUT	API for Uploading an Object - POST
	x-obs-server-side-data-encryption	Specifies the algorithm used for server-side encryption.	**AES256**: The AES-256 algorithm is used. AES-256 can be used for both SSE-KMS and SSE-OBS. **SM4**: The SM4 algorithm is used. SM4 can only be used for SSE-KMS.	If this header is not included, the AES-256 algorithm is used. **SM4**: The SM4 algorithm is used.	
	x-obs-server-side-encryption-kms-key-id	Specifies the ID of the KMS CMK when **SSE-KMS** is used.	Key ID	Key ID	Key ID
	x-obs-sse-kms-key-project-id	Specifies the ID of the project to which the KMS CMK belongs when **SSE-KMS** is used.	Project ID	-	-
	x-obs-server-side-encryption-customer-algorithm	Specifies the algorithm for **SSE-C**.	-	**AES256**: SSE-C and the AES-256 algorithm are used.	
	x-obs-server-side-encryption-customer-key	Specifies the plaintext key encoded in Base64 when **SSE-C** is used.	-	The plaintext key encoded in Base64	

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Type	Header	Description	API for Creating a Bucket	API for Uploading an Object - PUT	API for Uploading an Object - POST
	x-obs-server-side-encryption-customer-key-MD5	Specifies the MD5 value of the key when **SSE-C** is used.	-	The Base64-encoded MD5 value of the key	
	x-obs-copy-source-server-side-encryption-customer-algorithm	Specifies the algorithm for object copies when **SSE-C** is used.	-	-	-
	x-obs-copy-source-server-side-encryption-customer-key	Specifies the Base64-encoded key for object copies when **SSE-C** is used.	-	-	-
	x-obs-copy-source-server-side-encryption-customer-key-MD5	Specifies the MD5 value of the key used for object copies when **SSE-C** is used.	-	-	-
Response headers	x-obs-server-side-encryption	Specifies the server-side encryption method.	**kms**: SSE-KMS is used for encryption. **obs**: SSE-OBS is used for encryption.	**kms**: SSE-KMS is used for encryption. **AES256**: SSE-OBS and the AES-256 algorithm are used.	

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Type	Header	Description	API for Creating a Bucket	API for Uploading an Object - PUT	API for Uploading an Object - POST
	x-obs-server-side-data-encryption	Specifies the algorithm used for server-side encryption.	**AES256**: The AES-256 algorithm is used. AES-256 can be used for both SSE-KMS and SSE-OBS. **SM4**: The SM4 algorithm is used. SM4 can only be used for SSE-KMS.	If this header is not included, the AES-256 algorithm is used. **SM4**: The SM4 algorithm is used.	
	x-obs-server-side-encryption-kms-key-id	Specifies the ID of the KMS CMK when **SSE-KMS** is used.	The key ID is returned only for custom keys.	The key ID is returned for both default keys and custom keys.	
	x-obs-sse-kms-key-project-id	Specifies the ID of the project to which the KMS CMK belongs when **SSE-KMS** is used.	The project ID is returned only for custom keys.		
	x-obs-server-side-encryption-customer-algorithm	Specifies the algorithm for **SSE-C**.	-	**AES256**: SSE-C and the AES-256 algorithm are used.	
	x-obs-server-side-encryption-customer-key-MD5	Specifies the Base64-encoded MD5 value of the key when **SSE-C** is used.	-	The Base64-encoded MD5 value of the key	

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Table 6-5 Server-side encryption APIs and parameters

Type	Header	Description	API for Copying an Object	API for Initiating a Multipart Upload	API for Uploading Parts	API for Copying Parts	API for Completing a Multipart Upload
Request headers	x-obs-server-side-encryption	Specifies the encryption method.	**kms**: SSE-KMS is used for encryption. **AES256**: SSE-OBS and the AES-256 algorithm are used.		-	-	-
	x-obs-server-side-data-encryption	Specifies the algorithm used for server-side encryption.	**AES256**: The AES-256 algorithm is used. **SM4**: The SM4 algorithm is used.		-	-	-
	x-obs-server-side-encryption-kms-key-id	Specifies the ID of the KMS CMK when **SSE-KMS** is used.	Key ID		-	-	-
	x-obs-sse-kms-key-project-id	Specifies the ID of the project to which the KMS CMK belongs when **SSE-KMS** is used.	-	-	-	-	-

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Type	Header	Description	API for Copying an Object	API for Initiating a Multipart Upload	API for Uploading Parts	API for Copying Parts	API for Completing a Multipart Upload
	x-obs-server-side-encryption-customer-algorithm	Specifies the algorithm for **SSE-C**.	**AES256**: SSE-C and the AES-256 algorithm are used.				-
	x-obs-server-side-encryption-customer-key	Specifies the plaintext key encoded in Base64 when **SSE-C** is used.	The plaintext key encoded in Base64				-
	x-obs-server-side-encryption-customer-key-MD5	Specifies the MD5 value of the key when **SSE-C** is used.	The Base64-encoded MD5 value of the key				-
	x-obs-copy-source-server-side-encryption-customer-algorithm	Specifies the algorithm for object copies when **SSE-C** is used.	**AES256**: The target object copy is encrypted using SSE-C and the AES-256 algorithm.	-	-	**AES256**: The target object copy is encrypted using SSE-C and the AES-256 algorithm.	-

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Type	Header	Description	API for Copying an Object	API for Initiating a Multipart Upload	API for Uploading Parts	API for Copying Parts	API for Completing a Multipart Upload
	x-obs-copy-source-server-side-encryption-customer-key	Specifies the Base64-encoded key for object copies when **SSE-C** is used.	The plaintext key encoded in Base64	-	-	The plaintext key encoded in Base64	-
	x-obs-copy-source-server-side-encryption-customer-key-MD5	Specifies the Base64-encoded MD5 value of the key used for object copies when **SSE-C** is used.	The Base64-encoded MD5 value of the key	-	-	The Base64-encoded MD5 value of the key	-
Response headers	x-obs-server-side-encryption	Specifies the encryption method.	**kms**: SSE-KMS is used for encryption. **AES256**: SSE-OBS and the AES-256 algorithm are used.				
	x-obs-server-side-data-encryption	Specifies the algorithm used for server-side encryption.	If this header is not included, the AES-256 algorithm is used. **SM4**: The SM4 algorithm is used.				
	x-obs-server-side-encryption-kms-key-id	Specifies the ID of the KMS CMK when **SSE-KMS** is used.	Key ID				

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Type	Header	Description	API for Copying an Object	API for Initiating a Multipart Upload	API for Uploading Parts	API for Copying Parts	API for Completing a Multipart Upload
	x-obs-sse-kms-key-project-id	Specifies the ID of the project to which the KMS CMK belongs when **SSE-KMS** is used.	The project ID is returned only for custom keys.				
	x-obs-server-side-encryption-customer-algorithm	Specifies the algorithm for **SSE-C**.	**AES256**: SSE-C and the AES-256 algorithm are used.				
	x-obs-server-side-encryption-customer-key-MD5	Specifies the Base64-encoded MD5 value of the key when **SSE-C** is used.	The Base64-encoded MD5 value of the key				

Table 6-6 Server-side encryption APIs and parameters

Type	Header	Description	API for Downloading an Object	API for Querying Object Metadata
Request headers	x-obs-server-side-encryption	Specifies the encryption method.	-	-

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Type	Header	Description	API for Downloading an Object	API for Querying Object Metadata
	x-obs-server-side-data-encryption	Specifies the algorithm used for server-side encryption.	-	-
	x-obs-server-side-encryption-kms-key-id	Specifies the ID of the KMS CMK when **SSE-KMS** is used.	-	-
	x-obs-sse-kms-key-project-id	Specifies the ID of the project to which the KMS CMK belongs when **SSE-KMS** is used.	-	-
	x-obs-server-side-encryption-customer-algorithm	Specifies the algorithm for **SSE-C**.	**AES256**: SSE-C and the AES-256 algorithm are used.	
	x-obs-server-side-encryption-customer-key	Specifies the plaintext key encoded in Base64 when **SSE-C** is used.	The plaintext key encoded in Base64	
	x-obs-server-side-encryption-customer-key-MD5	Specifies the MD5 value of the key when **SSE-C** is used.	The Base64-encoded MD5 value of the key	
	x-obs-copy-source-server-side-encryption-customer-algorithm	Specifies the algorithm for object copies when **SSE-C** is used.	-	-
	x-obs-copy-source-server-side-encryption-customer-key	Specifies the Base64-encoded key for object copies when **SSE-C** is used.	-	-
	x-obs-copy-source-server-side-encryption-customer-key-MD5	Specifies the Base64-encoded MD5 value of the key used for object copies when **SSE-C** is used.	-	-
Response headers	x-obs-server-side-encryption	Specifies the encryption method.	**kms**: SSE-KMS is used for encryption. **AES256**: SSE-OBS and the AES-256 algorithm are used.	

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Type	Header	Description	API for Downloading an Object	API for Querying Object Metadata
	x-obs-server-side-data-encryption	Specifies the algorithm used for server-side encryption.	If this header is not included, the AES-256 algorithm is used. **SM4**: The SM4 algorithm is used.	
	x-obs-server-side-encryption-kms-key-id	Specifies the ID of the KMS CMK when **SSE-KMS** is used.	Key ID	
	x-obs-sse-kms-key-project-id	Specifies the ID of the project to which the KMS CMK belongs when **SSE-KMS** is used.	-	-
	x-obs-server-side-encryption-customer-algorithm	Specifies the algorithm for **SSE-C**.	**AES256**: SSE-C and the AES-256 algorithm are used.	
	x-obs-server-side-encryption-customer-key-MD5	Specifies the Base64-encoded MD5 value of the key when **SSE-C** is used.	The Base64-encoded MD5 value of the key	

6.2 Versioning

Scenarios

OBS can store multiple versions of an object. You can quickly search for and restore different versions or restore data in the event of accidental deletions or application faults.

By default, versioning is disabled for a new OBS bucket. New objects will overwrite existing objects in the bucket in case they have the same names.

Constraints

When you enable **WORM** for a bucket, OBS automatically enables versioning and versioning cannot be suspended later for that bucket.

Enabling Versioning

- Enabling versioning does not change the version ID (**null**) and content of any existing object in a bucket. After versioning is enabled for a bucket, if you

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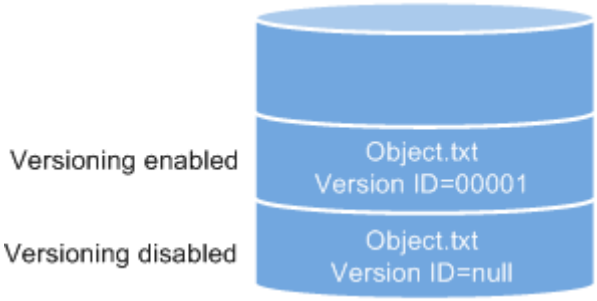
upload a new object with the same name as an existing object, a version ID will be assigned to this new object, as shown in **Figure 6-7**.

Figure 6-7 Versioning (with existing objects)



- In a versioning-enabled bucket, OBS automatically assigns a unique version ID to each newly uploaded object. Objects with the same name are stored in OBS with different version IDs, as shown in **Figure 6-8**.

  Figure 6-8 Versioning (for new objects)

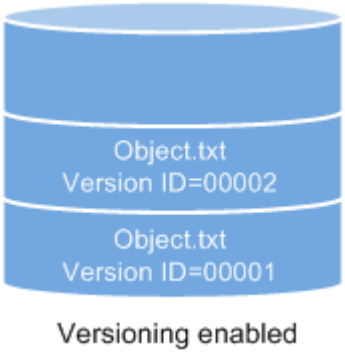
  

  Table 6-7 Version description

Version	Description
Latest version	After versioning is enabled, each operation on an object will result in saving of the object with a new version ID. The version ID generated upon the latest operation is called the latest version.
Historical version	After versioning is enabled, each operation on an object will result in saving of the object with a new version ID. Version IDs generated upon operations other than the latest operation are called historical versions.

- The latest objects in a bucket are returned by default after a GET Object request.
- Objects can be downloaded by version IDs. By default, the latest object is downloaded if the version ID is not specified. For details, see **Related Operations** in **Versioning**.
- You can select an object and click **Delete** on the right to delete the object. After the object is deleted, OBS inserts a delete marker. After **Historical**

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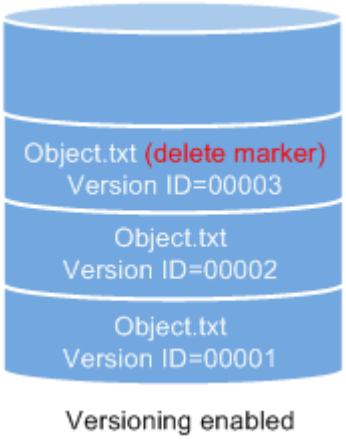
Versions is enabled, the object with a delete marker appears in the object list. For details, see **Deleting an Object**. If you try to access the deleted object, a 404 error will be returned.

Figure 6-9 Object with a delete marker

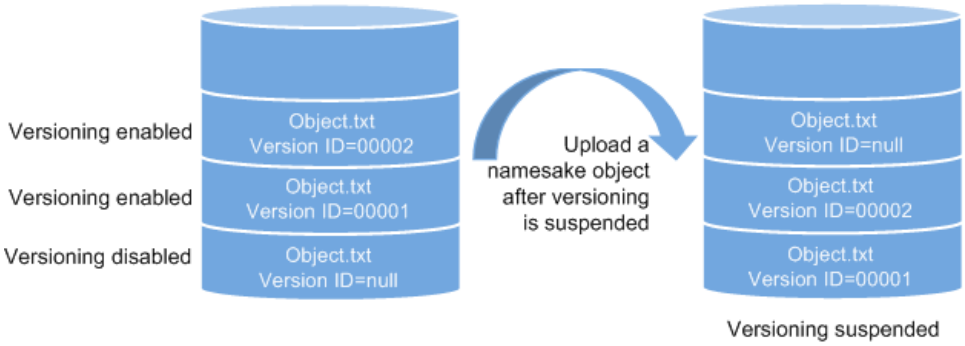


- After enabling **Historical Versions** above the object list, you can permanently delete any object version.
- All object versions except those with **Delete Marker** stored in OBS are charged.

Suspending Versioning

Once versioning is enabled for a bucket, it cannot be disabled, but it can be suspended. When versioning is suspended, a null, not a specific version ID, will be allocated to a newly uploaded object. If the newly uploaded object has the same name as an existing object with a null version ID, the new object will overwrite the existing object.

Figure 6-10 Object versions in the scenario when versioning is suspended



If versioning is no longer needed, you can suspend it. After versioning is suspended:

- Existing object versions are still retained in OBS. If you no longer desire these versions, manually delete them.
- Objects can be downloaded by version IDs. By default, the latest object is downloaded if the version ID is not specified.

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- All historical object versions except those with **Delete Marker** stored in OBS are charged.

Differences Between Scenarios When Versioning Is Suspended and Disabled

If you delete an object from a versioning-suspended bucket, a delete marker with a **null** version ID will be generated, no matter whether the object has historical versions. But, if versioning is disabled, the same operation will not generate a delete marker.

NOTE

In a versioning-enabled bucket, each historical version of an object is stored and you will be billed for the storage of all object versions. Therefore, enable versioning when necessary.

Ways to Configure Versioning

You can use **OBS Console**, APIs, or SDKs to configure versioning for a bucket.

Using OBS Console

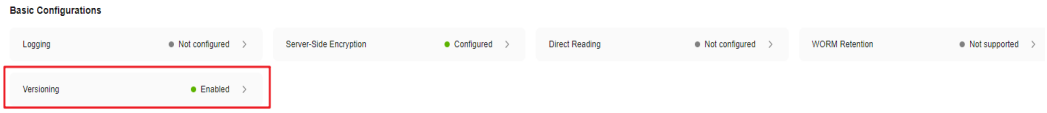
Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Overview**.

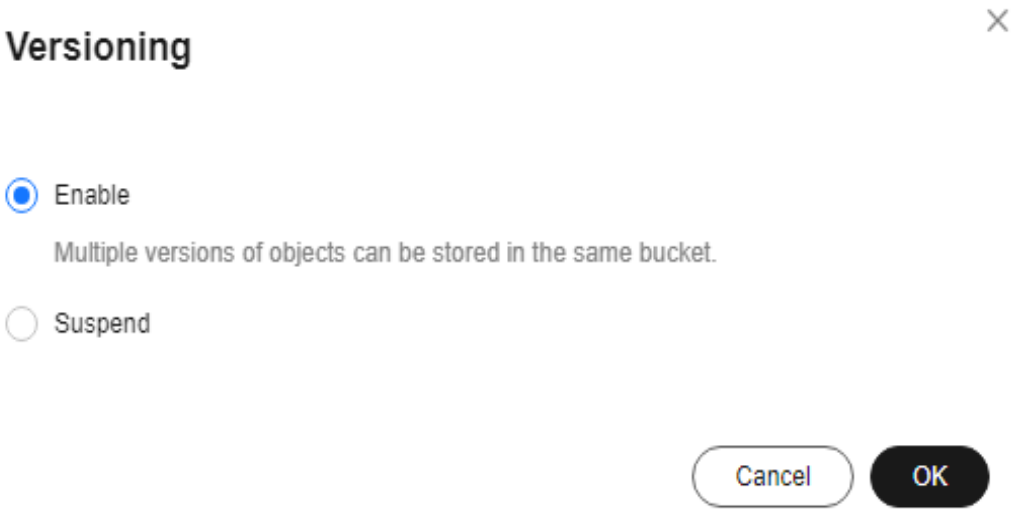
Step 4 In the **Basic Configurations** area, click **Versioning**.

Figure 6-11 Editing versioning status



Step 5 Select **Enable**.

Figure 6-12 Configuring versioning



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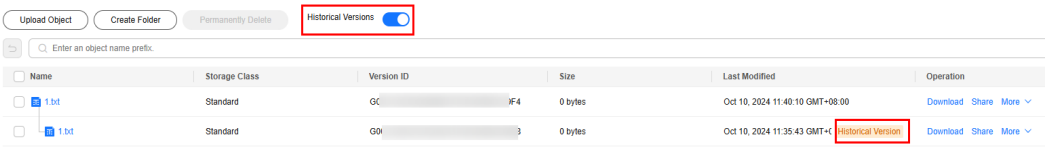
Step 6 Click **OK** to enable versioning for the bucket.

Step 7 In the navigation pane, choose **Objects**. The object list page is displayed.

Step 8 Above the search box, enable **Historical Versions** to view multiple versions of an object.

Figure 6-13 Viewing object versions



----End

Using APIs

Configuring Versioning for a Bucket

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Related Operations

After versioning is configured for a bucket, you can delete, share, and download object versions, and extend the retention period of an object version.

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the object list, view all versions of the object.

Step 4 Perform the following operations on object versions:

1. Download a desired version of the object by clicking **Download** in the **Operation** column.

   NOTE

   If the version you want to download is in the Archive or Deep Archive storage class, restore it first.

2. Share a version of the object by clicking **Share** in the **Operation** column.
3. Permanently delete a version of the object by choosing **More** > **Delete** in the **Operation** column. The deleted object version cannot be recovered. If you delete the latest version, the most recent version will become the latest version.

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NOTE

In a WORM-enabled bucket, if an object has no retention policy configured or its retention policy has expired, you can delete a desired object versionon the object list page. If the object version is within the retention period, it cannot be deleted.

4. Locate the object version for which you want to extend the retention period, choose **More** > **Extend Retention Period**, and select a date. A retention period can only be extended, but not shortened.

----End

6.3 Configuring WORM to Protect Objects from Being Overwritten or Deleted

OBS provides write-once-read-many (WORM) to protect objects from being deleted or tampered with within a specified period. WORM works at both the bucket and object levels in compliance mode.

Scenarios

In compliance mode, a WORM-protected object version cannot be overwritten or deleted by anyone, including the root user in your account.

When WORM is configured for a bucket, the protection applies to all objects in the bucket. When WORM is configured for an object version, the protection applies to the current object version only. No matter which type of WORM protection you want to use, you must enable WORM for the bucket first. A bucket-level WORM retention policy takes effect only for objects uploaded after the policy was configured. If an object is protected by a bucket-level WORM policy and an object-level WORM policy at the same time, the object-level WORM policy takes precedence.

Important Notes

- When you enable WORM for a bucket, OBS automatically enables versioning and versioning cannot be suspended later for that bucket. WORM protects objects based on the object version IDs. Only object versions with any WORM retention policy configured can be protected. Assume that object **test.txt 001** is protected by WORM. If another file with the same name is uploaded, a new object version **test.txt 002** with no WORM policy configured will be generated. In such case, **test.txt 002** is not protected and can be deleted. When you download an object without specifying a version ID, the current object version (**test.txt 002**) will be downloaded.
- A lifecycle rule cannot delete WORM-protected objects, but can transition their storage class. After an object is no longer protected, it will be deleted when meeting the expiration rule in a lifecycle configuration.
- Buckets with WORM enabled do not support cross-region replication.
- If you have deregistered your account or your account has been frozen, the WORM-protected objects will be permanently deleted.
- WORM-based protection is not available for migration.

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- The metadata of a WORM-protected object can still be modified.

Configuring WORM for a Bucket

You can use **OBS Console** or APIs to configure WORM for a bucket.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Overview**.

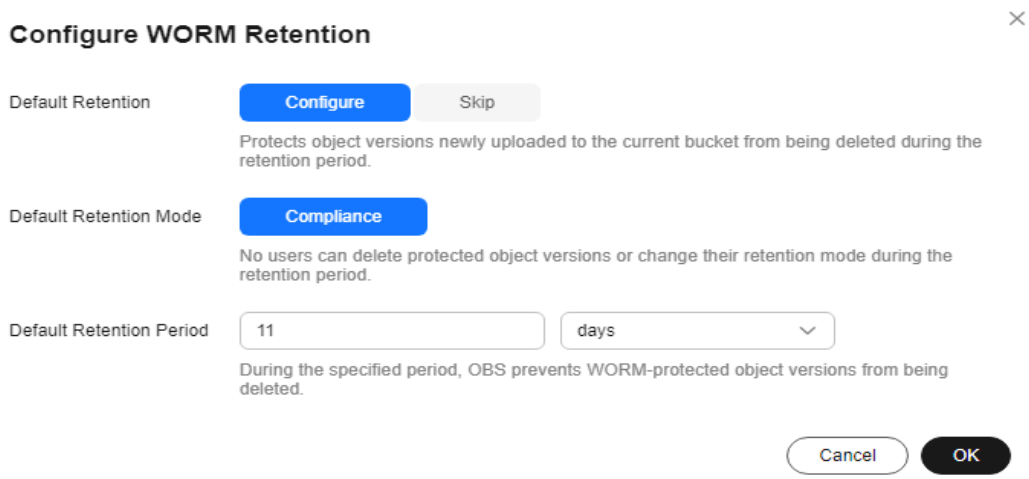
Step 4 In the **Basic Configurations** area, click **WORM**. The **WORM** dialog box is displayed.

Step 5 Choose **Configure** and specify a default retention period. The default retention mode is **Compliance**.

NOTE

- Only the compliance retention mode is currently supported. In this mode, no users can delete protected object versions or change their retention mode during the specified retention period.
- During the specified default retention period, OBS prevents WORM-protected object versions from being deleted. You can configure a retention period in either days (from **1** to **36500**) or years (from **1** to **100**). The upper limit is 100 years.
- When you upload an object to a WORM-protected bucket, the object inherits the WORM retention from the bucket by default. You can also configure a different WORM retention for the object under advanced settings. If both bucket-level and object-level WORM retention policies are applied to an object, the object-level retention policy will be used.

Figure 6-14 Configuring a WORM retention policy



Step 6 Click **OK**.

----End

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Using APIs

Creating a Bucket

Configuring a Default WORM Policy for a Bucket

Obtaining the Default WORM Policy of a Bucket

Configuring WORM Retention for an Object

Querying Object Metadata that helps obtain the object-level WORM retention configuration

Skipping the WORM Retention Configuration

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

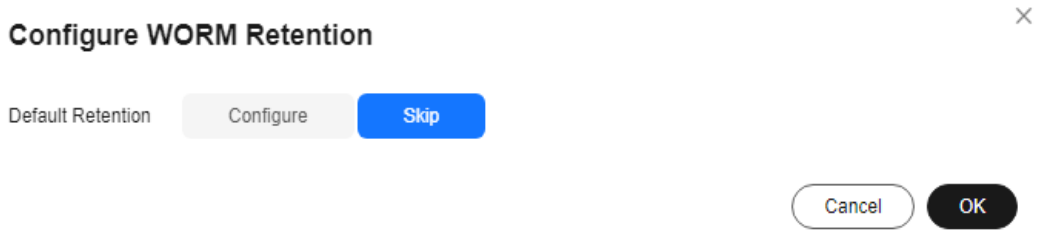
Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Overview**.

Step 4 In the **Basic Configurations** area, click **WORM Retention**. The **Configure WORM Retention** dialog box is displayed.

Step 5 Select **Skip** and click **OK**.

Figure 6-15 Skipping the WORM retention configuration



----End

Extending the Retention Period

After WORM is configured, you can extend the retention period of an object version. OBS will prevent the protected object version from being deleted before the specified time.

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Locate the object version for which you want to extend the retention period, choose **More** > **Extend Retention Period**, and select a date.

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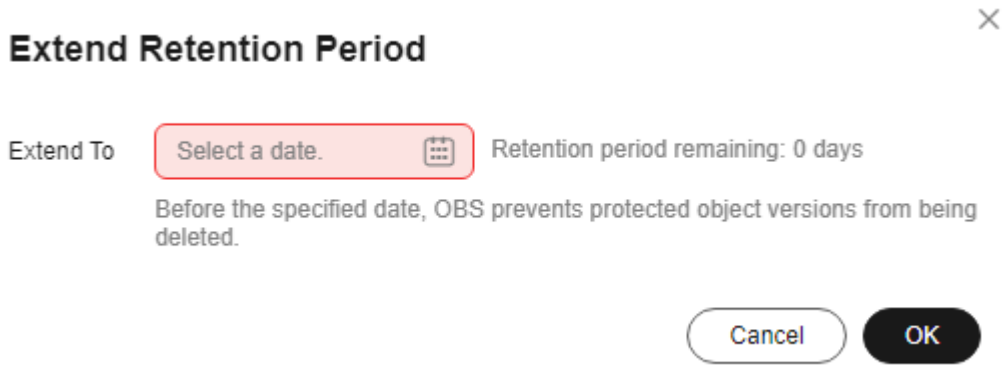
Figure 6-16 Extending the retention period



NOTE

A retention period can only be extended, but not shortened.

Assume that an object version was configured to be protected until March 30, 2023. If you want to extend the retention period on March 1, 2023, you can extend it to March 31, 2023 or a later date. If you extend the retention period on April 1, 2023, you can extend it to the current day (April 1, 2023) or a later date. If the current day is used, the object version will no longer be protected by WORM after 24:00 on that day.

----End

Manually and Permanently Deleting Objects from a WORM-Enabled Bucket

In a WORM-enabled bucket, if an object has no retention policy configured or its retention policy has expired, you can delete a desired version of the object. If an object version is within the retention period, it cannot be deleted.

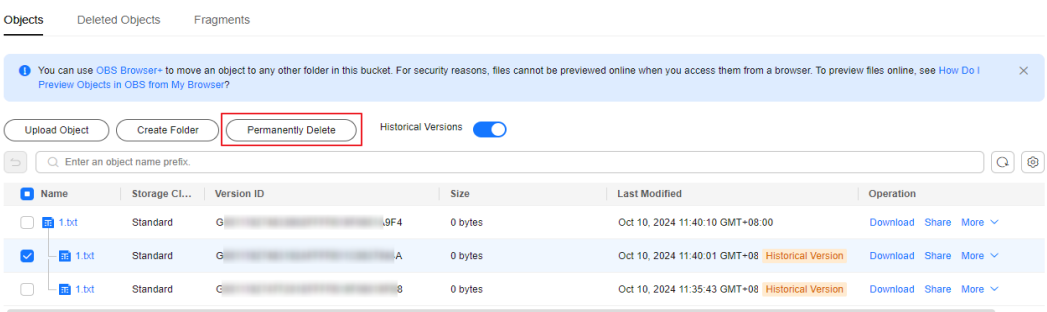
Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Enable **Historical Versions**.

Step 4 Select the object version to be permanently deleted and click **Permanently Delete** above the search bar.

Figure 6-17 Permanently deleting an object version



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Step 5 Click **OK**.

----End

Using a Lifecycle Rule to Delete Objects from a WORM-Enabled Bucket

You can configure a lifecycle rule to let OBS automatically expire and delete objects in a WORM enabled bucket. To realize this, the objects must have no retention policies configured or their retention policies have expired. If the objects are within their retention period, they cannot be deleted.

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

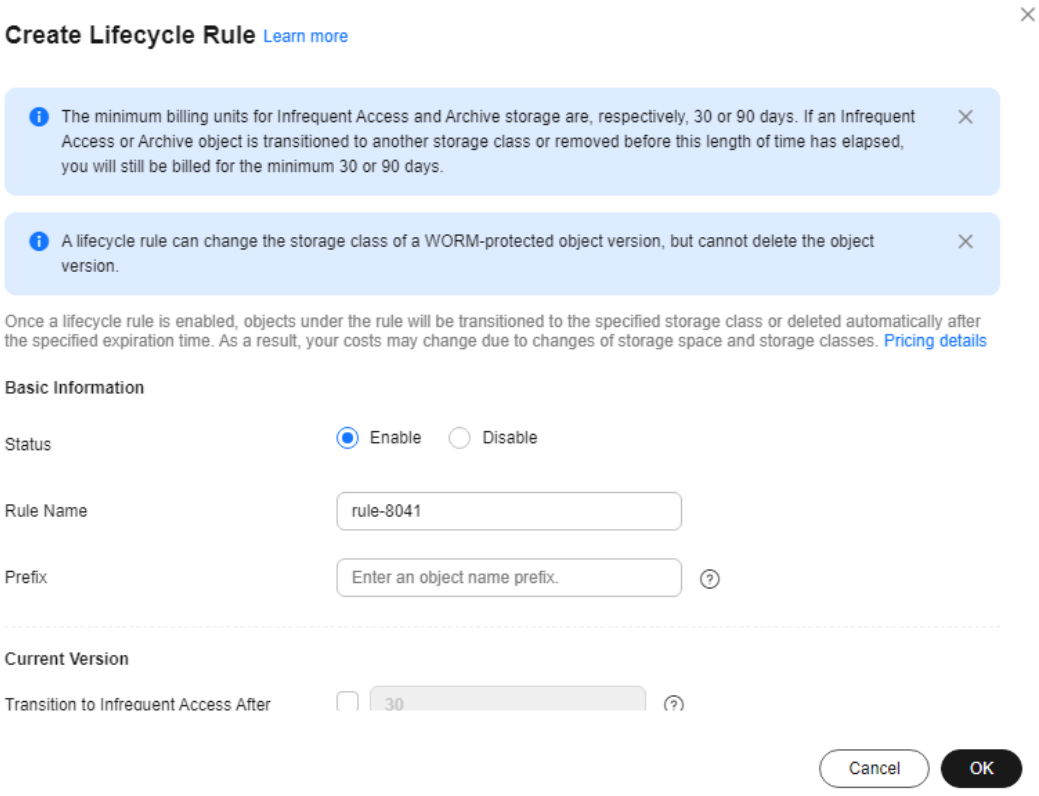
Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Overview**.

Step 4 In the navigation pane, choose **Basic Configurations** > **Lifecycle Rules**.

Step 5 Click **Create**.

Figure 6-18 Creating a lifecycle rule



Step 6 Configure a lifecycle rule.

Configure parameters under **Basic Information**:

- **Status**: Select **Enable** to enable this lifecycle rule after the configuration.
- **Rule Name**: It identifies a lifecycle rule. The rule name must be no longer than 255 characters.

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- **Prefix**: It is optional.
  - If this field is configured, objects with the specified prefix will be managed by the lifecycle rule. The prefix cannot start with a slash (/) or contain two consecutive slashes (//), and cannot contain the following special characters: \:*?"<>|
  - If this field is not configured, all objects in the bucket will be managed by the lifecycle rule.

Configure parameters under **Current Version** or **Historical Version**:

Delete Objects After (Days): After this number of days since the last update, OBS will expire and then delete the objects meeting the specified conditions. The days set here must be larger than any of the days configured for the transition actions.

Suppose that you last updated the following files in OBS on November 7, 2023:

- **log/notConfigured-1.log** (This file has no WORM retention policy configured.)
- **log/expired-1.log** (The WORM retention policy configured for this file has expired.)
- **doc/withinRetention-1.doc** (The WORM retention policy configured for this file expires on November 30, 2023.)

Then on November 10, 2023, you last updated the following files:

- **log/notConfigured-2.log** (This file has no WORM retention policy configured.)
- **log/expired-2.log** (The WORM retention policy configured for this file has expired.)
- **doc/withinRetention-2.doc** (The WORM retention policy configured for this file expires on November 30, 2023.)

On November 10, 2023, you set the objects prefixed with **log** to expire one day later. You might encounter the following situations:

- Objects **log/notConfigured-1.log** and **log/expired-1.log** last updated on November 7, 2023 might be deleted after the last system scan. The deletion could happen on November 10, 2023 or November 11, 2023, depending on the time of the last system scan. **doc/withinRetention-1.doc** will not be deleted.
- Objects **log/notConfigured-2.log** and **log/expired-2.log** last uploaded on November 10, 2023 might be deleted on November 11, 2023 or November 12, 2023, depending on whether they have been stored for over one day (since their last update) when the system scan happened. **doc/withinRetention-2.doc** will not be deleted.

NOTE

For more information, see **Creating a Lifecycle Rule**.

Step 7 Click **OK**.

----End

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Related Operations

When uploading an object, configure a retention policy for the object. For details, see **Simple Upload (PUT)**.

To normally delete objects from a WORM-enabled bucket, see **Deleting an Object**.

6.4 Configuring CORS to Allow Cross-Origin Access to OBS

This section describes how to use CORS in HTML5 to enable cross-origin access.

You can create CORS rules or replicate existing CORS rules from another bucket.

Context

Cross-origin access refers to access between different domains.

For browser security purposes, cross-origin access is typically restricted by the same-origin policy. Under this policy, resources in a domain cannot be accessed by a different domain using JavaScript.

If two web pages have the same protocol, domain name or IP, and port (if specified), they have the same origin. **Table 6-8** shows you how to determine whether the URLs listed in the table have the same origin as **https://support.huaweicloud.com/dir/test.html**.

Table 6-8 Cross-origin analysis

URL	Access Result	Reason
https://support.huaweicloud.com/dir/other.html	Succeeded	Same protocol, domain name, and port
https://support.huaweicloud.com/dir/inner/other.html	Succeeded	Same protocol, domain name, and port
http://support.huaweicloud.com/dir/test.html	Failed	Same domain name and port, but different protocols
https://support.huaweicloud.com:81/dir/test.html	Failed	Same protocol and domain name, but different ports
https://help.huaweicloud.com/dir/test.html	Failed	Same protocol and port, but different domain names

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Scenarios

CORS (cross-origin resource sharing) is a browser-standard mechanism provided by the World Wide Web Consortium (W3C). It defines how a web client in one origin interacts with resources in another origin. For general web page requests, website scripts and contents in one origin cannot interact with those in another origin because of Same Origin Policies (SOPs).

OBS supports CORS. OBS resources can be accessed across origins.

OBS supports **static website hosting**. Static websites stored in OBS can respond to website requests from another origin only when CORS is configured for the bucket where the website files are stored.

CORS:

- Enables you to access OBS resources without using a proxy when using JavaScript and HTML5 to develop web applications.
- Enables you to directly upload files to OBS with the dragging function of HTML5, view the progress, or update contents directly from web applications.
- Enables external web pages, style sheets, or HTML5 applications hosted in different origins to share web fonts or images stored in OBS.

The CORS configuration takes about two minutes to take effect.

NOTICE

OBS is configured to support cross-origin access using the root domain name by default. To prevent potential attacks:

You can create a **crossdomain.xml** file with specific rules in the bucket for your client and add then **Security.loadPolicyFile("https://bucket.obs.ap-southeast-1.myhuaweicloud.com/crossdomain.xml")** in the flash code of the file. **bucket.obs.ap-southeast-1.myhuaweicloud.com** needs to be replaced with the actual access domain name of your bucket.

Prerequisites

Static website hosting has been configured. For details, see **Static Website Hosting**.

Creating a CORS Rule

You can use **OBS Console**, APIs, or SDKs to create CORS rules.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Data Security** > **CORS Rules**.

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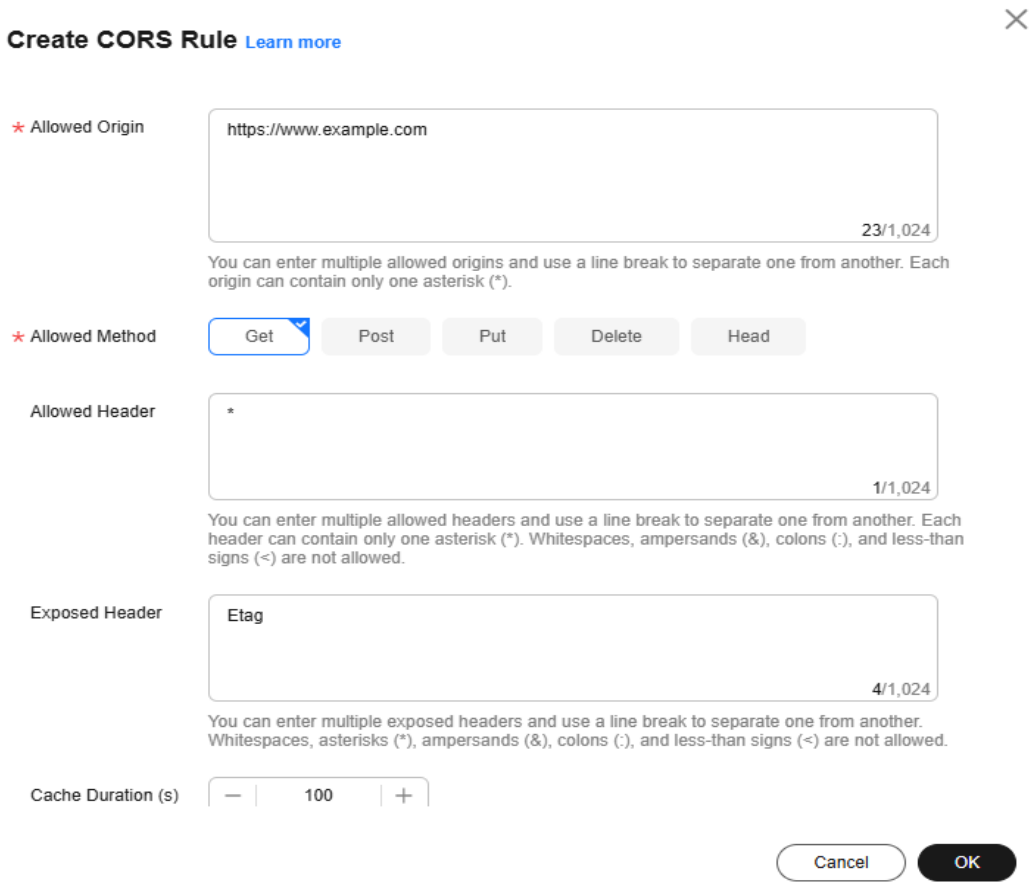
Step 4 Click **Create**. The **Create CORS Rule** dialog box is displayed. See **Figure 6-19** for details.

NOTE

A bucket can have a maximum of 100 CORS rules configured.

Figure 6-19 Creating a CORS rule



Step 5 In the **CORS Rule** dialog box, configure **Allowed Origin**, **Allowed Method**, **Allowed Header**, **Exposed Header**, and **Cache Duration (s)**.

NOTE

If CDN acceleration is enabled for the bucket, HTTP headers must be configured on CDN. For details, see **HTTP Header Settings**.

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Table 6-9 Parameters in CORS rules

Parameter	Description
Allowed Origin	Mandatory Specifies the origins from which requests can access the bucket. Multiple matching rules are allowed. One rule occupies one line, and allows one wildcard character (*) at most. An example is given as follows: http://rds.example.com https://*.vbs.example.com
Allowed Method	Mandatory Specifies the allowed request methods for buckets and objects. The methods include Get, Post, Put, Delete, and Head.
Allowed Header	Optional Specifies the allowed headers in cross-origin requests. Only CORS requests matching the allowed headers are valid. You can enter multiple allowed headers (one per line) and each line can contain one wildcard character (*) at most. Spaces and special characters including **&:<** are not allowed.
Exposed Header	Optional Specifies the exposed headers in CORS responses, providing additional information for clients. By default, a browser can access only headers **Content-Length** and **Content-Type**. If the browser wants to access other headers, you need to configure those headers in this parameter. For the configuration of other headers, see **Configuring CORS for a Bucket**. You can enter multiple exposed headers (one per line). Spaces and special characters including ***&:<** are not allowed.
Cache Duration (s)	Mandatory Specifies the duration that your browser can cache CORS responses, expressed in seconds. The default value is **100**.

Step 6 Click **OK**.

Message "The CORS rule created successfully." is displayed. The CORS configuration takes effect within two minutes.

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Then, only the addresses specified in **Allowed Origin** can access the OBS bucket using the methods specified in **Allowed Method**. Suppose you configure a CORS rule for bucket **testbucket** by setting **Allowed Origin** to **https://www.example.com**, **Allowed Method** to **GET**, **Allowed Header** to *, **Exposed Header** to **ETag**, and **Cache Duration (s)** to **100**. Then, OBS only allows GET requests from **https://www.example.com** to access bucket **testbucket**. In addition, there are no limits on headers in the requests, the ETag value can be returned in the response, and the client which the requests are from can cache the CORS response for 100 seconds.

----End

Using APIs

Configuring Bucket CORS

Using SDKs

Java	Python	C	Go	BrowserJS: not supported	.NET	Android	iOS	PHP	Node.js

Replicating CORS Rules

You can only use OBS Console to replicate CORS rules.

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Data Security** > **CORS Rules**.

Step 4 Click **Replicate**.

Step 5 Select a replication source, which is the bucket whose CORS rules you want to replicate.

NOTE

- The CORS rules replicated from a source bucket will not overwrite existing rules in the destination bucket, and any that conflict with the existing ones will not be replicated.
- Both source and destination buckets must be of the 3.0 version.
- You can remove the rules that you do not want to replicate.
- There can be 100 CORS rules at most in a bucket. If the number of rules you will replicate plus the number of existing rules in the destination bucket exceeds 100, the replication will fail. Before replicating the rules, delete some if necessary.

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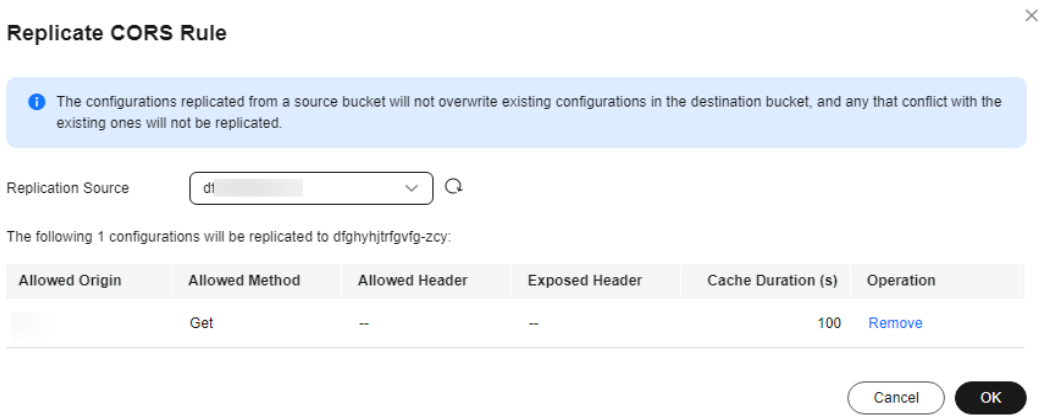
Figure 6-20 Replicating CORS rules



Step 6 Click **OK** to replicate the CORS rules to the destination bucket.

----End

6.5 Configuring URL Validation to Prevent Unauthorized Access to Your Data

OBS blocks access requests from blacklisted URLs and allows those from whitelisted URLs.

Scenarios

Some rogue websites may steal links from other websites to enrich their content without any costs. Link stealing hurts the interests of the original websites and it is also a strain on their servers. URL validation is designed to address this issue.

In HTTP, the **Referer** field allows websites and web servers to identify where people are visiting them from. URL validation of OBS utilizes this **Referer** field. The idea is that once you find that a request to your resource is not originated from an authorized source, you can have the request blocked or redirected to a specific web page. This way, OBS prevents unauthorized access to data stored in buckets.

Referers can be configured using a whitelist or blacklist.

Referer rules are as follows:

- The length of a whitelist or blacklist cannot exceed 1,024 characters.
- Referer format:
  - You can enter multiple referers, each in a line.
  - The referer parameter supports asterisks (*) and question marks (?). An asterisk works as a wildcard that can replace zero or multiple characters, and a question mark (?) can replace a single character.
  - If the referer header field contains **http** or **https** during download, the referer must contain **http** or **https**.

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- If **Whitelisted Referers** is left blank but **Blacklisted Referers** is not, all websites except those specified in the blacklist are allowed to access data in the target bucket.
- If both **Whitelisted Referers** and **Blacklisted Referers** have referers, only those specified in the whitelist that are not in the blacklist are allowed to access the target bucket.

NOTE

If **Whitelisted Referers** overlaps with **Blacklisted Referers**, the overlapped referers are forbidden. For example, if both **Whitelisted Referers** and **Blacklisted Referers** contain **https://www.example.com**, requests from this website will be blocked.

- If **Whitelisted Referers** and **Blacklisted Referers** are both left blank, all websites are allowed to access data in the target bucket by default.
- Before determining whether a user has the four types of permissions (read, write, ACL read, and ACL write) for a bucket or objects in the bucket, check whether this user complies with the URL validation principles of the **Referer** field.
- Referer can be a wildcard domain name.

Whitelist and blacklist setting methods:

- Whitelist settings

  By setting a whitelist, you can allow requests from the websites in the whitelist, but deny those from the websites that are not in the whitelist.

  For the requests that are initialized from a browser's address box, you can add the **${null}** field to **Referer** of **Condition** to specify whether to allow the HTTP requests with a blank **referer**.

  To configure a whitelist, refer to the following policy:

```
"Statement":[
   {"Sid": "1",
    "Effect": "Allow",
    "Principal": {"ID":["*"]},
    "Action": "*",
    "Resource":["bucket/*"],
   },
   {"Sid":"2",
    "Effect":"Deny",
    "Principal":{"ID":["*"]},
    "Action":["*"],
    "Resource":["bucket/*"],
    "Condition":{
        "StringNotEquals":
        {"Referer":["http://www.example01.com","${null}"]}
     }
   }
]
```

  If you set a whitelist in this way, only the requests whose **referer** is set to **www.example01.com** or left blank can work on resources in buckets.

- Blacklist settings

  To configure a blacklist, refer to the following policy:

```
"Statement":[
   {"Sid":"1",
    "Effect":"Deny",
    "Principal":{"ID":["*"]},
    "Action":["*"],
    "Resource":["bucket/*"],
```

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```
    "Condition":{
       "StringEquals":
         {"Referer":["http://www.example01.com","http://www.example02.com"]}
     }
    }
]
```

If you set a blacklist in this way, requests whose **referer** is set to **www.example01.com** or **www.example02.com** cannot work on resources in buckets.

Prerequisites

Static website hosting has been enabled.

Ways to Configure URL Validation

You can use **OBS Console** or APIs to configure URL validation.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Data Security** > **URL Validation**.

Step 4 Click next to the text box of **Whitelisted Referers** or **Blacklisted Referers** and enter the referers.

Principles for setting **Referers**:

- The length of a whitelist or blacklist cannot exceed 1024 characters.
- Referer format:
  - You can enter multiple referers, each in a line.
  - The referer parameter supports asterisks (*) and question marks (?). An asterisk works as a wildcard that can replace zero or multiple characters, and a question mark (?) can replace a single character.
  - If the referer header field contains **http** or **https** during download, the referer must contain **http** or **https**.
- If **Whitelisted Referers** is left blank but **Blacklisted Referers** is not, all websites except those specified in the blacklist are allowed to access data in the target bucket.
- If **Whitelisted Referers** is not left blank, only the websites specified in the whitelist are allowed to access the target bucket no matter whether **Blacklisted Referers** is left blank or not.

NOTE

If **Whitelisted Referers** is configured the same as **Blacklisted Referers**, the blacklist takes effect. For example, if both **Whitelisted Referers** and **Blacklisted Referers** are set to **https://www.example.com**, access requests from this address will be blocked.

- If **Whitelisted Referers** and **Blacklisted Referers** are both left blank, all websites are allowed to access data in the target bucket by default.

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- Before determining whether a user has the four types of permissions (read, write, ACL read, and ACL write) for a bucket or objects in the bucket, check whether this user complies with the URL validation principles of the **Referer** field.

Step 5 Click ✓ to save the settings.

----End

Using APIs

Configure a URL validation whitelist

6.6 Configuring Access Control with Both VPC Endpoint Policies and OBS Bucket Policies

Scenarios

You can apply both VPC endpoint policies and OBS bucket policies to control access to OBS resources at the VPC level. This dual-policy approach ensures that data is transmitted within a secure network environment and minimizes the risk of unauthorized access. This approach is particularly useful in the following scenarios:

- Preventing Internet access to sensitive data: Healthcare organizations often store sensitive data such as medical images and electronic medical records in OBS. For compliance and security purposes, this data must not be transmitted over the Internet. Only authorized servers (ECSs, CCE, or BMSs) in a specific Huawei Cloud VPC can access the data over the intranet. Access from the other VPCs will be denied.
- Assigning VPC-specific access: Enterprises often need to share their data stored in OBS across departments with varying access levels. The development team in VPC1 requires read and write access to all data, the test team in VPC2 requires read access to all data, and other teams in VPC3 require read access to only a set of data.

Context

Virtual Private Cloud (VPC) allows you to provision logically isolated virtual private networks for cloud resources, such as cloud servers, containers, and databases. You can create and manage cloud resources in a VPC, which is secure and flexible. For more information, see **What Is Virtual Private Cloud?**

VPC Endpoint (VPCEP) provides secure, private channels that connect your VPCs to VPC endpoint services, for example, OBS. This allows resources within a VPC to access OBS without using EIPs. For more information, see **What Is VPC Endpoint?**

You can use VPCEP to share data stored in OBS with VPCs. You can also share data stored in OBS with on-premises data centers via **Direct Connect** or **Virtual Private Network (VPN)** to build a hybrid cloud network where you can flexibly integrate resources.

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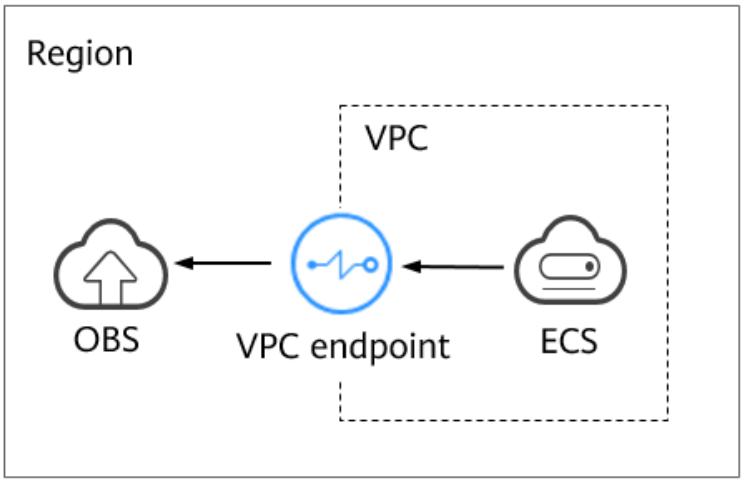
Sharing Data in OBS with a VPC

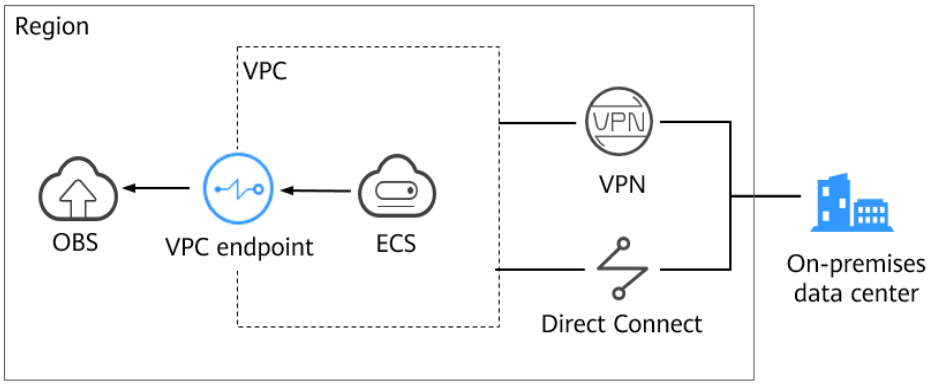
Figure 6-21 Sharing data in OBS with a VPC



In the same region, if you want to use a VPC endpoint to access OBS over a private network, add OBS as a VPC endpoint service, and create a corresponding VPC endpoint in your VPC. You can then access OBS via the VPC endpoint.

Sharing Data in OBS with an On-Premises Data Center

Figure 6-22 Sharing data in OBS with an on-premises data center



If you want to access OBS from an on-premises data center over a private network, use Direct Connect or a VPN gateway to set up a bridge between the on-premises data center and the VPC that is in the same region as OBS. Then, use a VPC endpoint to connect the VPC to OBS.

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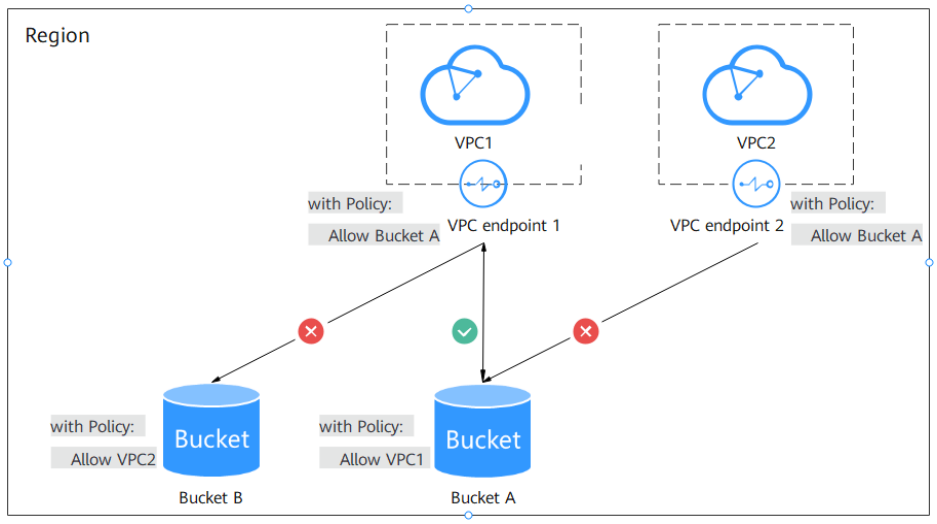
How the Dual-Policy Approach Works

Figure 6-23 How the dual-policy approach works



VPC endpoint policies and OBS bucket policies ensure data security by working on the request sources and the requested resources, respectively.

A VPC endpoint policy defines which resources in OBS can be accessed by servers (ECSs or CCE) in a given VPC. As shown in **Figure 6-23**, VPC endpoint 1 allows servers in VPC1 to access bucket A but not bucket B. Therefore, VPC1 can access bucket A but cannot access bucket B.

A bucket policy specifies servers in which VPC can access specific OBS buckets. As shown in **Figure 6-23**, bucket A's bucket policy allows requests from VPC1 but denies requests from VPC2. Therefore, VPC1 can access bucket A, but VPC2 cannot.

Syntax of VPC Endpoint Policies

VPC endpoint policies comply with the principle of least privilege. If a policy does not explicitly allow access, it will deny access by default. When you purchase a VPC endpoint, the system assigns a default policy for it. This policy allows full access to OBS. You can modify the default policy when creating a VPC endpoint or adjust the policy after the VPC endpoint is created. Note the following when using VPC endpoint policies:

- A VPC endpoint policy becomes effective 10 minutes after configuration.
- VPC endpoint policies differ from IAM permissions in that VPC endpoint policies do not contain the **sid** field or the **Condition** tag.

A VPC endpoint policy consists of **Effect**, **Action**, and **Resource**.

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Table 6-10 VPC endpoint policy parameters

Parameter	Description
Effect	Determines whether to allow or deny the specified actions. • **Allow**: The specified actions are allowed. • **Deny**: The specified actions are denied. The default value is **Deny**. If both Allow and Deny apply to the same action, Deny takes precedence.
Action	Actions that can be performed on OBS resources. The format is *Service name*:*Resource type*:*Operation*. A policy can contain one or more actions. An asterisk (*) is allowed to indicate all of the services, resource types, or operations depending on its location in the action. Actions are case insensitive. OBS has two types of resources: buckets and objects. • A bucket-related action is in the **obs:bucket:***Operation* format. For example, **obs:bucket:ListAllMybuckets** grants permission to list OBS buckets. **obs** is the service name, **bucket** is the resource type, and **ListAllMybuckets** is the operation. • An object-related action is in the **obs:object:***Operation* format. For details about actions, see **Bucket Actions** and **Object Actions**.
Resource	Resources which the policy applies to. The resource format is **obs:*:*:***Resource type*:*Resource path*. Resource types are case insensitive. The options are as follows: • **bucket**: It indicates that the policy applies to buckets. • **object**: It indicates that the policy applies to objects. • ***: A wildcard character (*) indicates that the policy applies to both buckets and objects. The resource path format is *Bucket name* or *Bucket name*/*Object name*. A wildcard (*) is allowed. Resource paths are case sensitive. The following gives some examples: • **obs:*:*:bucket:***: all OBS buckets • **obs:*:*:object:my-bucket/my-object/***: all objects in the **my-object** directory of the **my-bucket** bucket

Typical Scenarios and Policy Configuration Examples

The following provides typical application scenarios and configuration examples of the dual-policy approach.

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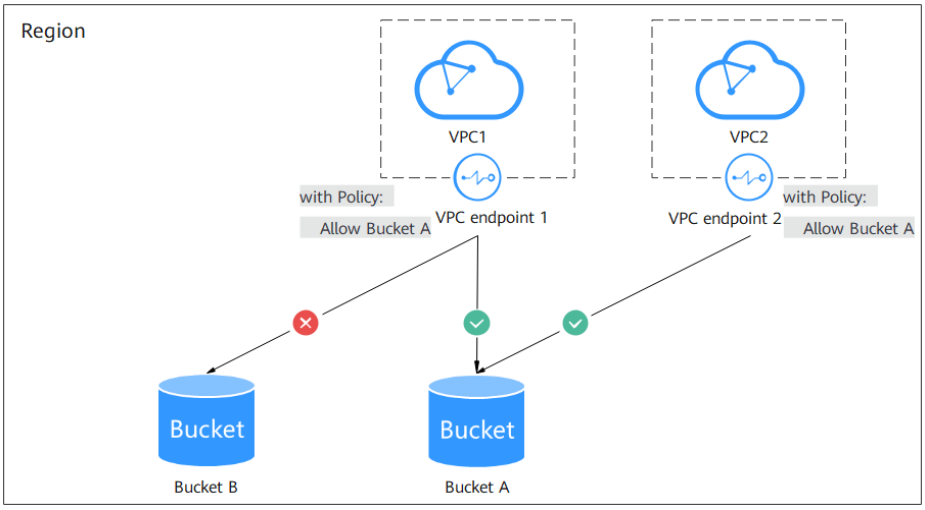
Example 1: Letting a VPC Access Only a Specified OBS Bucket

Figure 6-24 Example 1



Description

The servers in VPC1 can download objects from bucket A only. Bucket A has no bucket policy configured, so other VPCs can also access bucket A.

Configuration

Configure the VPC endpoint policy for VPC1 as follows:

Path: **Service List** > **VPC Endpoint** > *Click the ID of the corresponding VPC endpoint* > **Policy** > **Edit**

```
[
  {
    "Action": [
      "obs:object:GetObject"
    ],
    "Resource": [
      "obs:*:*:object:bucketA/*"
    ],
    "Effect": "Allow"
  }
]
```

Example 2: Letting a VPC Perform Only Specified Operations on a Specified OBS Bucket

Description

The servers in VPC1 can download objects from bucket A only.

Servers in VPC1 are allowed to download all objects except object **myobject** from bucket A.

Configuration

Configure the VPC endpoint policy for VPC1 as follows:

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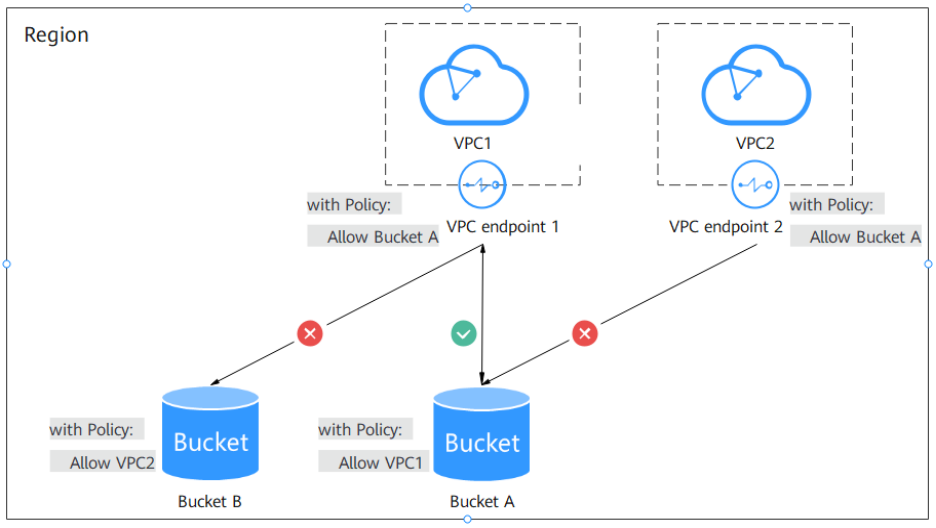
Path: **Service List** > **VPC Endpoint** > *Click the ID of the corresponding VPC endpoint* > **Policy** > **Edit**

```
[
  {
    "Action": [
      "obs:object:GetObject"
    ],
    "Resource": [
      "obs:*:*:object:bucketA/*"
    ],
    "Effect": "Allow"
  },
  {
    "Action": [
      "obs:object:GetObject"
    ],
    "Resource": [
      "obs:*:*:object:bucketA/myobject"
    ],
    "Effect": "Deny"
  }
]
```

Example 3: Letting a VPC Access Only a Specified OBS Bucket and an OBS Bucket Be Accessed Only by a Specified VPC

Figure 6-25 Example 3



Description

Upload and download access is restricted exclusively to servers in VPC1 and to bucket A.

The ID of VPC1 is **4dad1f75-0361-4aa4-ac75-1ffdda3a0fec**.

Configuration

1. Configure the VPC endpoint policy for VPC1 as follows:

   Path: **Service List** > **VPC Endpoint** > *Click the ID of the corresponding VPC endpoint* > **Policy** > **Edit**

   ```
   [
     {
   ```

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```
    "Action": [
        "obs:object:GetObject",
    "obs:object:PutObject"
    ],
    "Resource": [
        "obs:*:*:object:bucketA/*"
    ],
    "Effect": "Allow"
  }
]
```

2. Configure the bucket policy for bucket A as follows:

   For details, see **Creating a Custom Bucket Policy (JSON View)**.

   You need to configure two bucket policies:

   - Bucket policy 1: Allow servers in VPC1 to upload objects to or download objects from bucket A.

     In the example below, you can customize *statementId*. *domainId* and *userId* must be set to the account ID and user ID that are allowed to upload and download objects. For details, see **Bucket Policies**.

     ```
     {
       "Statement": [
         {
           "Sid": "statementId",
           "Effect": "Allow",
           "Principal": {
             "ID": ["domain/domainId:user/userId"]
           },
           "Action": ["GetObject", "PutObject"],
           "Resource": ["bucketA/*"],
           "Condition": {
             "StringEquals": {
               "SourceVpc": ["4dad1f75-0361-4aa4-ac75-1ffdda3a0fec"]
             }
           }
         }
       ]
     }
     ```

   - Bucket policy 2: Prevent servers in VPCs other than VPC1 from operating bucket A and the objects therein.

     You can customize *DenyReqNotFromVpc*.

     ```
     {
       "Statement": [
         {
           "Sid": "DenyReqNotFromVpc",
           "Effect": "Deny",
           "Principal": {
             "ID": ["*"]
           },
           "Action": "*",
           "Resource": ["bucketA", "bucketA/*"],
           "Condition": {
             "StringNotEquals": {
               "SourceVpc": ["4dad1f75-0361-4aa4-ac75-1ffdda3a0fec"]
             }
           }
         }
       ]
     }
     ```

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> **NOTE**
>
> After the bucket policies are configured, authorized IAM users can still upload or download objects using SDKs or APIs. If uploads or downloads on **OBS Console** or OBS Browser+ are required, the **obs:bucket:ListAllMyBuckets** and **obs:bucket:ListBucket** permissions must be configured in IAM. Without these permissions, access to OBS Console or OBS Browser+ will result in an error, and buckets and their objects will not be displayed.

Example 4: Authorizing Another Cloud Service to Access the Bucket After a Bucket Has Both VPC Endpoint Policies and Bucket Policies Configured

Description

After both VPC endpoint policies for VPC1 and bucket policies for bucket A are configured, any other cloud services, including OBS, cannot access bucket A. If you want to authorize another cloud service to access bucket A, you can create an agency.

The ID of VPC1 is **4dad1f75-0361-4aa4-ac75-1ffdda3a0fec**.

Configuration

Step 1 Configure the VPC endpoint policy for VPC1 as follows:

Allow only servers in VPC1 to upload objects to or download objects from bucket A.

Path: **Service List** > **VPC Endpoint** > *Click the ID of the corresponding VPC endpoint* > **Policy** > **Edit**

```
[
  {
    "Action": [
       "obs:object:GetObject",
    "obs:object:PutObject"
    ],
    "Resource": [
       "obs:*:*:object:bucketA/*"
    ],
    "Effect": "Allow"
  }
]
```

Step 2 **Create an IAM agency** to delegate a cloud service to access bucket A. For example, to delegate OBS to access bucket A, you can create an agency and associate the system-defined policy **OBS FullAccess** with it, or create a custom policy and apply it to the agency.

Step 3 Configure the bucket policy for bucket A as follows:

Allow only objects in bucket A to be accessed by servers in VPC1 or by the cloud service whose agency is **testAgencyName**. **testAgencyName** needs to be replaced with the name of the IAM agency created in **Step 2**.

```
{
  "Statement": [
    {
       "Effect": "Allow",
       "Principal": {"ID": ["*"]},
       "Action": ["*"],
       "Resource": ["bucketA/*"],
       "Condition": {
```

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```
            "StringEquals": {
               "SourceVpc": ["4dad1f75-0361-4aa4-ac75-1ffdda3a0fec"]
            }
         }
      },
      {
         "Effect": "Allow",
         "Principal": {"ID": ["*"]},
         "Action": ["*"],
         "Resource": ["bucketA/*"],
         "Condition": {
            "StringEquals": {
               "ServiceAgency": ["testAgencyName"]
            }
         }
      }
   ]
}
```

The bucket policy can also be configured as follows to get the same result.

```
{
   "Statement": [
      {
         "Effect": "Deny",
         "Principal": {"ID": ["*"]},
         "Action": ["*"],
         "Resource": ["bucketA/*"],
         "Condition": {
            "StringNotEquals": {
               "SourceVpc": ["4dad1f75-0361-4aa4-ac75-1ffdda3a0fec"],
               "ServiceAgency": ["testAgencyName"]
            }
         }
      }
   ]
}
```

----End

Securing Access with Both VPC Endpoint Policies and OBS Bucket Policies

The following uses access from an ECS in a VPC to an OBS bucket as an example (as shown in **Figure 6-26**) to show how to secure access by configuring both VPC endpoint policies and OBS bucket policies.

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Figure 6-26 Securing access by configuring both VPC endpoint policies and OBS bucket policies

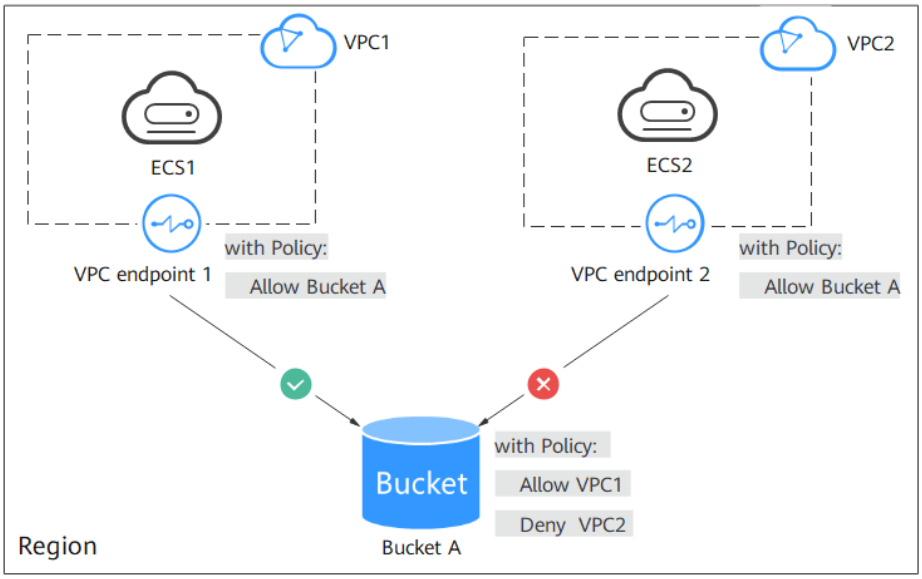

Table 6-11 Resource planning

Resource	Region	Quantity	Resource Name	Description
VPC	CN-Hong Kong	2	example-vpc1	It contains the **example-ecs1** ECS and is associated with **example-vpcep1**.
			example-vpc2	It contains the **example-ecs2** ECS and is associated with **example-vpcep2**.
VPC endpoint		2	example-vpcep1	It is associated with **example-vpc1** and controls the requests from **example-vpc1**. **example-vpcep1** grants permission to upload objects to and download objects from **example-bucket-a**.
			example-vpcep2	It is associated with **example-vpc2** and controls the requests from **example-vpc2**. **example-vpcep2** grants permission to upload objects to and download objects from **example-bucket-a**.
ECS		2	example-ecs1	Create this ECS in the **example-vpc1** VPC and select a Linux OS, for example, **Ubuntu 24.04 server 64bit(10GiB)**.

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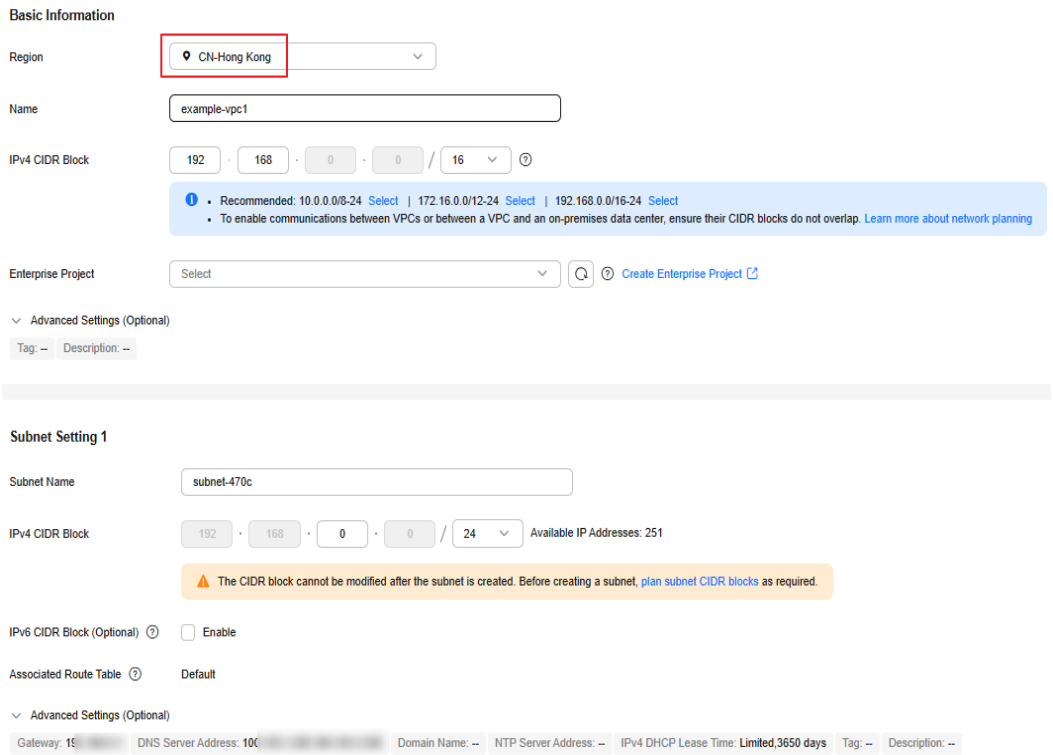
Resource	Region	Quantity	Resource Name	Description
			example-ecs2	Create this ECS in the **example-vpc2** VPC and select a Linux OS, for example, **Ubuntu 24.04 server 64bit(10GiB)**.
OBS		1	example-bucket-a	The bucket policy allows access from **example-vpc1** and denies access from **example-vpc2**.

Step 1: Create VPCs

Create two VPCs named **example-vpc1** and **example-vpc2**:

Go to the **VPC creation page**. Then, configure VPC parameters as instructed, choose the CN-Hong Kong region, and retain the default settings for other parameters. You can also customize VPCs. For details, see **Creating a VPC and Subnet**.



Step 2: Create Linux ECSs

Create two ECSs named **example-ecs1** and **example-ecs2**, and associate **example-ecs1** with **example-vpc1** and **example-ecs2** with **example-vpc2**.

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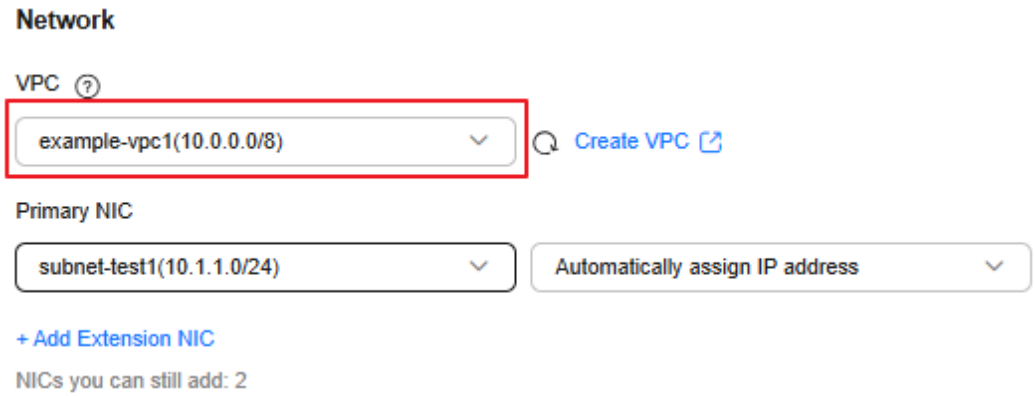
Step 1 Go to the **Custom Config page of the ECS console**.

Step 2 Configure ECS parameters as instructed and choose the CN-Hong Kong region.

Step 3 Choose an OS (**Ubuntu 24.04 server 64bit(10GiB)** as an example).

Step 4 In the **Network** area, select the VPC created in **Step 1: Create VPCs**. Associate **example-ecs1** with **example-vpc1** and **example-ecs2** with **example-vpc2**.



Step 5 Retain the default settings for other parameters. You can also customize ECSs. For details, see **Purchasing an ECS in Custom Config Mode**.

Step 6 Click **Submit** in the lower right corner.

----End

Step 3: Create an OBS Bucket and Upload an Object to the Bucket

Create a bucket named **example-bucket-a** and upload the **test.txt** object to it.

Step 1 Create a bucket named **example-bucket-a**.

Go to the **OBS bucket creation page**. Then, choose the CN-Hong Kong region, the **Standard** storage class, and the **Private** bucket policy. Retain the default settings for other parameters. You can also customize a bucket. For details, see **Creating a Bucket**.

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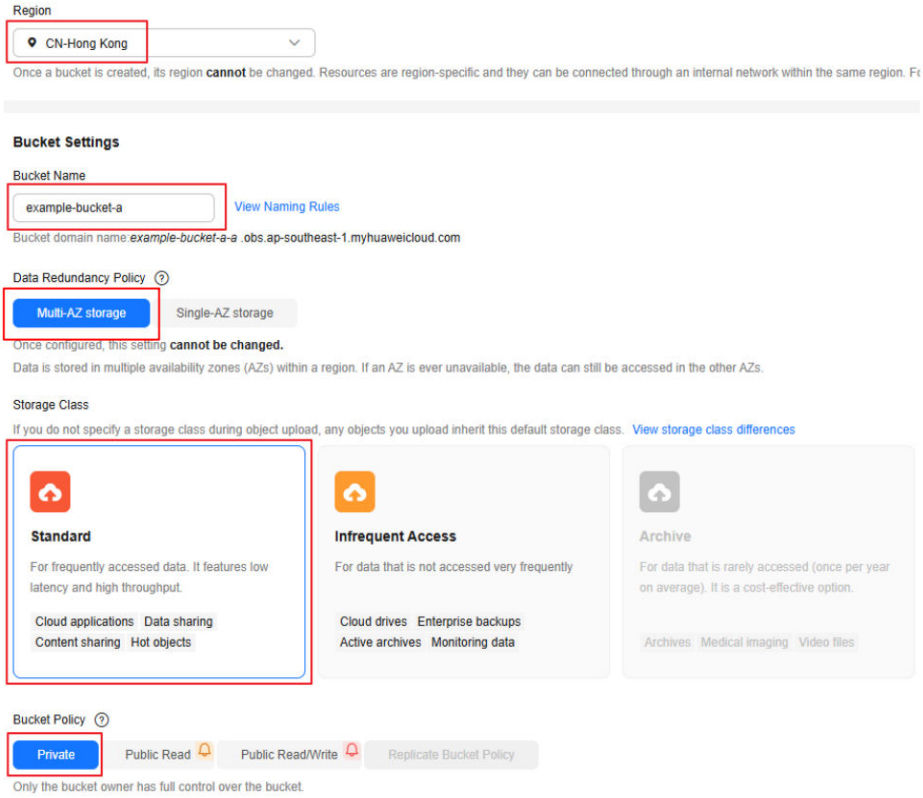

Step 2 Upload the **test.txt** object to **example-bucket-a**. For details, see **Uploading an Object**.

----End

Step 4: Configure Bucket Policies

Configure two bucket policies for the bucket. One allows only servers in **example-vpc1** to download objects from **example-bucket-a**. The other denies servers in other VPCs to operate **example-bucket-a** or objects in it.

Step 1 Log in to OBS **Console**. In the navigation pane, choose **Object Storage**.

Step 2 In the bucket list, click **example-bucket-a** created in **Step 3: Create an OBS Bucket and Upload an Object to the Bucket**. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Permissions** > **Bucket Policies**.

Step 4 Click **Create** and click the **JSON** tab.

Step 5 Configure the first bucket policy to allow the servers in **example-vpc1** to download objects from **example-bucket-a**.

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Table 6-12 Bucket policy parameters

Parameter	Description
domainId	ID of the account that is allowed to download objects from **example-bucket-a**. To obtain an account ID, see **Obtaining Account, IAM User, Group, Project, Region, and Agency Information**.
userId	ID of the IAM user that is allowed to download objects from **example-bucket-a**. To obtain an IAM user ID, see **Obtaining Account, IAM User, Group, Project, Region, and Agency Information**.
VPC ID of example-vpc1	ID of the VPC that is allowed to download objects from **example-bucket-a**. The ID of **example-vpc1** is used here. To obtain a VPC ID, see **Obtaining a VPC ID**.

```
{
   "Statement": [
      {
         "Sid": "exampleSidId1",
         "Effect": "Allow",
         "Principal": {
            "ID": ["domain/domainId:user/userId"]
         },
         "Action": ["GetObject"],
         "Resource": ["example-bucket-a/*"],
         "Condition": {
            "StringEquals": {
               "SourceVpc": ["VPC ID of example-vpc1"]
            }
         }
      }
   ]
}
```

Step 6 Click **Create**. The first bucket policy is configured.

Step 7 Click **Create**. On the **JSON** tab page, create the second bucket policy.

Step 8 Configure the second bucket policy that denies servers in all VPCs except **example-vpc1** to operate **example-bucket-a** or the objects in it.

VPC ID of example-vpc1 is the ID of **example-vpc1**. To obtain a VPC ID, see **Obtaining a VPC ID**.

```
{
   "Statement": [
      {
         "Sid": "exampleSidId2",
         "Effect": "Deny",
         "Principal": {
            "ID": ["*"]
         },
         "Action": "*",
         "Resource": ["example-bucket-a", "example-bucket-a/*"],
         "Condition": {
            "StringNotEquals": {
               "SourceVpc": ["VPC ID of example-vpc1"]
            }
         }
      }
```

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```
  ]
}
```

In this policy, **Principal** is set to a wildcard (*) and there is **Condition** configured, so this policy is applied to all visitors. If the bucket owner does not access the bucket from the specified VPC, its access will be denied too. Therefore, if you do not want to deny the access from the bucket owner, you can add a condition to the bucket policy as follows.

In the following example, *IAM user ID of bucket owner* is the IAM user ID of the bucket owner. To obtain an IAM user ID, see **Obtaining Account, IAM User, Group, Project, Region, and Agency Information**.

```
{
  "Statement": [
    {
      "Sid": "exampleSidId2",
      "Effect": "Deny",
      "Principal": {
        "ID": ["*"]
      },
      "Action": "*",
      "Resource": ["example-bucket-a", "example-bucket-a/*"],
      "Condition": {
        "StringNotEquals": {
          "SourceVpc": ["VPC ID of example-vpc1"],
          "g:UserId": ["IAM user ID of bucket owner"]
        }
      }
    }
  ]
}
```

Step 9 Click **Create**. The second bucket policy is configured.

----End

Step 5: Create VPC Endpoints and Configure VPC Endpoint Policies

Create two VPC endpoints **example-vpcep1** and **example-vpcep2** and associate **example-vpcep1** with **example-vpc1** and **example-vpcep2** with **example-vpc2**.

Step 1 Go to the **VPC Endpoints page**.

Step 2 Click **Buy VPC Endpoint** in the upper right corner.

Step 3 Select a region that the VPC endpoint belongs to. The region must be the same as that of the VPC and OBS bucket.

Step 4 Set **Billing Mode** to **Pay-per-use**.

Step 5 Choose **Find a service by name** for **Service Category**.

Step 6 Obtain the service name and verify it.

Submit a service ticket to obtain the service name. When submitting the service ticket, provide the OBS bucket name to technical support. Then, enter the obtained service name in the **VPC Endpoint Service Name** text box and click **Verify**.

Step 7 Specify the VPC.

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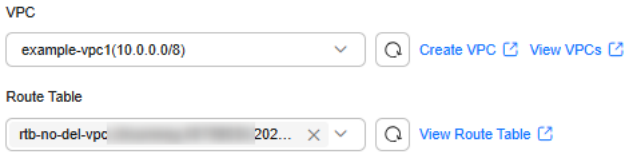
Choose the VPC created in **Step 1: Create VPCs** from the **VPC** drop-down list. Choose **example-vpc1** for **example-vpcep1** and **example-vpc2** for **example-vpcep2**. Retain the default settings for the route table and subnet.



Step 8 Configure VPC endpoint policies.

Enable **Policy** and edit the VPC endpoint policy. The following policy is used as an example. It allows ECSs in **example-vpc1** to upload objects to or download objects from **example-bucket-a**. Enter the following policy for both **example-vpcep1** and **example-vpcep2**.

```
[
  {
    "Action": [
       "obs:object:GetObject",
    "obs:object:PutObject"
    ],
    "Resource": [
       "obs:*:*:object:example-bucket-a/*"
    ],
    "Effect": "Allow"
  }
]
```

Step 9 Click **Next** in the lower right corner.

Step 10 Confirm the endpoint configuration and click **Submit**.

----End

Step 6: Use ECSs in VPCs to Access OBS

Log in to **example-ecs1** and download the object from **example-bucket-a**. **example-vpcep1** allows access to **example-bucket-a**, and the bucket policy allows access from **example-vpc1**, so the download is successful as expected.

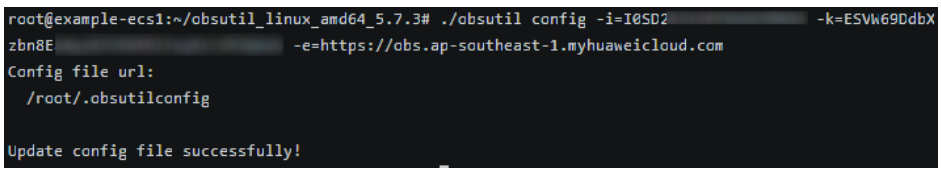
Step 1 Log in to the **example-ecs1** ECS.

In this example, **log in to the Linux ECS using CloudShell**. To use other login methods, see **Login Overview (Linux)**.

Step 2 Download and install obsutil on the ECS. For details, see **Downloading and Installing obsutil**.

Step 3 Initialize obsutil.

Initialize obsutil using the account (specified in **the first bucket policy**) that is allowed to access **example-bucket-a**. For details, see **Initializing the Configuration**. To obtain the AK/SK, see **Access Keys**.



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Step 4 Download the **test.txt** object from **example-bucket-a** to your local PC:

```
./obsutil cp obs://example-bucket-a/test.txt  test.txt
```

If the following output is displayed, the download is successful. This means that **example-ecs1** can access **example-bucket-a**.

```
root@example-ecs1:~/obsutil_linux_amd64_5.7.3# ./obsutil cp obs://example-bucket-a/test.txt  test.txt
Start at 2025-05-15 09:30:10.579814577 +0000 UTC


Parallel:      5                 Jobs:          5
Threshold:     50.00MB           PartSize:      auto
VerifyLength:  false             VerifyMd5:     false
CheckpointDir: /root/.obsutil_checkpoint
TempFileDir: /root/obsutil_linux_amd64_5.7.3


Download successfully, 0B, n/a, obs://example-bucket-a/test.txt --> /root/obsutil_linux_amd64_5.7.3/t
est.txt, cost [2], status [200], request id [                                    ]
```

----End

Log in to **example-ecs2** and download the object from **example-bucket-a**. The bucket policy of **example-bucket-a** denies access from **example-vpc2**, so the download request is denied and the download fails, as expected.

Step 1 Log in to the **example-ecs2** ECS.

In this example, **log in to the Linux ECS using CloudShell**. To use other login methods, see **Login Overview (Linux)**.

Step 2 Download and install obsutil on the ECS. For details, see **Downloading and Installing obsutil**.

Step 3 Initialize obsutil.

Initialize obsutil using the account (specified in **the first bucket policy**) that is allowed to access **example-bucket-a**. For details, see **Initializing the Configuration**.

Step 4 Download the **test.txt** object from **example-bucket-a** to your local PC:

```
./obsutil cp obs://example-bucket-a/test.txt  test.txt
```

If the following output is displayed, the download fails. This is because the download request from **example-ecs2** is denied, which is as expected.

```
root@example-ecs2:~/obsutil_linux_amd64_5.7.3# ./obsutil cp obs://example-bucket-a/test.txt
test.txt
Start at 2025-05-15 09:46:42.531144354 +0000 UTC


Parallel:      5                 Jobs:          5
Threshold:     50.00MB           PartSize:      auto
VerifyLength:  false             VerifyMd5:     false
CheckpointDir: /root/.obsutil_checkpoint
TempFileDir: /root/obsutil_linux_amd64_5.7.3


Download failed, obs://example-bucket-a/test.txt --> /root/obsutil_linux_amd64_5.7.3/test.txt
, cost [0], status [403], error code [AccessDenied], error message [Access Denied], request i
d [                                    ]
```

----End

Related Operations

When securing access by configuring both VPC endpoint policies and OBS bucket policies, you may also need to perform the following operations:

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Updating the Policy of an Existing VPC Endpoint

Step 1 Go to the **VPC Endpoints page**.

Step 2 Click the endpoint whose policy is to be updated. The endpoint details page is displayed.

Step 3 Click the **Policy** tab.

Step 4 Click **Edit**.

Step 5 Configure the VPC endpoint policy. For details, see **Syntax of VPC Endpoint Policies**.

Step 6 Click **Confirm**.

----End

Helpful Links

- **Using VPC Endpoint and Direct Connect to Enable On-Premises Data Centers to Access OBS**
- **Accessing OBS Using a VPN or Direct Connect Connection**
- **Bucket Policies**

6.7 Block Public Access

Public access means that a requester can access a bucket and data in the bucket without specific permissions or identity authentication, risking data leakage, malicious access, and high external network traffic. To avoid these risks, OBS allows you to enable Block Public Access for a bucket to ensure data security. With Block Public Access, bucket owners can easily configure centralized controls to restrict public access to resources.

Checking Whether a Bucket Is Publicly Accessible

You need to determine whether a bucket is public based on its bucket policies and ACL. If a bucket policy or the ACL allows public access, you can enable Block Public Access to avoid exposure.

- If **Principal** in a bucket policy is set to ***** and the condition keys, operators, and values meet the requirements listed in the following table, the bucket policy allows public access.

  Table 6-13 Conditions keys used for public access in bucket policies

Condition Key	Operator	Value Description
PrincipalID	StringLike	The first segment of characters separated by a colon (:) contains a wildcard character.
PrincipalAccount	StringLike	There is a wildcard.
DomainId		

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Condition Key	Operator	Value Description
PrincipalOrgID		
PrincipalOrgManage-mentAccountID		
SourceVpc		
SourceVpce		
SourceIP	IpAddress or NotIpAddress	The number of valid IPv4 addresses exceeds 2^{32-8}, or the number of valid IPv6 addresses exceeds 2^{128-32}.
PrincipalUrn	StringLike	The URN does not contain five segments or the third segment (Account) contains a wildcard character.
PrincipalOrgPath	StringLike	The first segment of characters separated by a slash (/) contains a wildcard character.

NOTE

A wildcard character is an asterisk (*) or a question mark (?).

Example 1: **Principal** is set to *****.

```
{
    "Principal": "*",
    "Resource": "*",
    "Action": "PutObject",
    "Effect": "Allow",
    "Condition": { "StringLike": {"SourceVpc": "vpc-*"}}
}
```

Example 2: The value of **SourceVpc** contains a wildcard character.

```
{
    "Principal": "exampleID",
    "Resource": "*",
    "Action": "PutObject",
    "Effect": "Allow",
    "Condition": { "StringLike": {"SourceVpc": "vpc-*"}}
}
```

- In an ACL, if the granted entity is **Everyone**, the authorized account ID contains a wildcard character, or either **public-read**, **public-read-write**, **public-read-delivered** or **public-read-write-delivered** is configured, the ACL allows public access.

  Example 1: Configure a bucket ACL to allow public access in its header.

```
PUT /?acl HTTP/1.1
Authorization: OBS H4IPJX0TQTHTHEBQQCEC:iqSPeUBl66PwXDApxjRKk6hlcN4=
User-Agent: curl/7.29.0
Host: examplebucket.obs.region.myhuaweicloud.com
x-obs-acl: public-read
Date: WED, 01 Jul 2015 02:37:22 GMT
Content-Type: application/xml
```

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Example 2: Configure a bucket ACL to allow public access in its body.

```
<AccessControlPolicy xmlns="http://obs.cn-north-4.myhuaweicloud.com/doc/2024-12-30/">
  <Owner>
    <ID>b4bf1b36d9ca43d984fbcb9491b6fce9</ID>
  </Owner>
  <AccessControlList>
    <Grant>
      <Grantee>
        <Canned>Everyone</Canned>
      </Grantee>
      <Permission>READ_ACP</Permission>
    </Grant>
  </AccessControlList>
</AccessControlPolicy>
```

Block Public Access Settings

OBS provides four Block Public Access settings. You can use them in any combination and apply them to buckets.

Table 6-14 Four Block Public Access settings

Setting	Description
BlockPublicAcls	Enabling this setting will: • Make object upload fail if the configured ACL allows public access. • Prevent modifying a bucket or an object ACL to allow public access.
BlockPublicPolicy	Enabling this setting will prevent creating or modifying a bucket policy that contains public access.
IgnorePublicAcls	Enabling this setting will: • Ignore any bucket or object ACL that allows public access and block unauthorized users and those without specified permissions from accessing the buckets and objects in the buckets. • Allow you to configure an ACL for an object to allow public access when you upload it. When the object is accessed, the ACL that allows public access will be ignored. • Allow you to configure a new public ACL for a bucket or an object. When the bucket or object is accessed, all public ACLs on them will be ignored. For example, if **IgnorePublicAcls** is enabled for bucket **A**, you can configure an ACL for object **b** to allow public access either during its upload to bucket **A** or after the upload is complete.
RestrictPublicBuckets	Enabling this setting will invalidate any bucket policy that contains public access. Afterward, only the bucket owner account and its IAM users can access the bucket and objects within.

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Important Notes

- Before enabling Block Public Access, verify that your services can work correctly without public access.
- To block public access, your account must have the **PutBucketPublicAccessBlock** permission.
- If Block Public Access is enabled for a bucket, OBS returns all ACL rules on the bucket when you obtain the ACL of the bucket or any object it contains. For example, if **IgnorePublicAcls** is enabled for a bucket with an ACL that allows public access, obtaining the bucket's ACL will still show the ACL rule that allows public access.
- Enabling Block Public Access does not affect existing bucket policies or ACLs. Therefore, disabling the Block Public Access settings will make any bucket or object with a public bucket policy or ACL publicly accessible again.
- By default, Block Public Access (four settings in **Table 6-14**) is enabled for newly created buckets but disabled for newly created parallel file systems. Enabling it for parallel file systems may degrade performance. For existing buckets, Block Public Access is disabled by default and must be manually enabled if needed.

Constraints

- You can block public access only for buckets, not for accounts or specified objects.
- To ensure that Block Public Access can work appropriately, the total size of all bucket policies cannot exceed 20 KB, and the combined size of all ACLs and bucket policies cannot exceed 32 KB. If the size exceeds the upper limit, requests for setting bucket policies or bucket ACLs, querying the public status of buckets, and enabling Block Public Access may be denied, with error code 400 and message "Bucket policy and bucket acl is too large/complicated to perform block public access analysis" returned.
- Block Public Access is not available for mirroring-based back to source scenarios.
- During cross-region replication, if the destination bucket has the **BlockPublicAcls** setting, objects with public ACLs in the source bucket will fail to be replicated.
- To use Block Public Access, you must have the following permissions.

Table 6-15 Permissions required for using Block Public Access

Operation	Required Permissions
Configuring Block Public Access for a bucket	Bucket owner or a user with the **PutBucketPublicAccessBlock** permission
Obtaining the Block Public Access configuration of a bucket	Bucket owner or a user with the **GetBucketPublicAccessBlock** permission

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Operation	Required Permissions
Deleting the Block Public Access configuration of a bucket	Bucket owner or a user with the **DeleteBucketPublicAccessBlock** permission
Obtaining the public access status of a bucket policy	Bucket owner or a user with the **GetBucketPolicyPublicStatus** permission
Obtaining the public access status of a bucket	Bucket owner or a user with the **GetBucketPublicStatus** permission

Ways to Use Block Public Access

You can use **OBS Console**, SDKs, or APIs, to use Block Public Access.

Using OBS Console

You can enable Block Public Access when creating a bucket. For details, see **Creating a Bucket**. You can also enable or edit the function after a bucket is created. The procedure is as follows:

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane on the left, choose **Permissions** > **Block Public Access**. The **Block Public Access** page is displayed

Step 4 Enable settings as required.

Enabling all settings prevents the creation of new ACLs or bucket policies that contain public access, and invalidates existing ones. Only the bucket owner can access the bucket and objects within.

The following four settings are supported:

- **Prevent the creation of ACLs that allow public access.**
- **Prevent the creation of bucket policies that allow public access.**
- **Ignore ACLs that allow public access.**
- **Ignore bucket policies that allow public access.**

Step 5 Click **Save**.

Step 6 In the **Modify Block Public Access?** dialog box, enter **Confirm** and click **OK**.

----End

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Using APIs

Configuring Block Public Access for a Bucket

Obtaining the Block Public Access Configuration of a Bucket

Deleting the Block Public Access Configuration of a Bucket

Obtaining the Public Access Status of a Bucket Policy

Obtaining the Public Access Status of a Bucket

Using SDKs

Java	**Python**	C: not supported	Go: not supported	BrowserJS: not supported	.NET: not supported	Android: not supported	iOS: not supported	PHP: not supported	Node.js: not supported

Helpful Links

Why Is the Error Message "Block Public Access enabled. Disable Block Public Access and try again." Displayed When I Edit a Bucket Policy or ACL on the Console After Block Public Access Is Enabled?

Cause of the bucket policy configuration error: **OBS Console** treats all individual policies on it as one unified policy. If you already have configured a bucket policy that allows public access and then enable Block Public Access, an error will be reported when you edit the bucket policy in visual editor mode on the console.

Solution to the bucket policy configuration error: Use the JSON mode to delete the content that allows public access in the bucket policy and then edit the bucket policy.

Cause of the ACL configuration error: **OBS Console** treats all individual ACLs on it as one unified ACL. If you already have configured an ACL that allows public access and then enable Block Public Access, an error will be reported when you edit the ACL on the console.

Solution to the ACL configuration error: Use the API or SDK to delete the content that allows public access in the ACL and then edit the ACL.

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7 Domain Name Management

7.1 Overview of Bucket Domain Names

OBS bucket-related domain names include **user-defined domain names, acceleration domain names,** and **default domain names**.

When you use the default domain name to access objects in a bucket, the objects are forcibly downloaded and cannot be previewed. If you do not want to expose a bucket's default domain name or want to preview objects in a browser, you can bind a user-defined domain name to the bucket and use this bound domain name to access objects in the bucket. In addition, if you want to use a user-defined domain name to accelerate access to objects in a bucket, you can bind a CDN acceleration domain name to the bucket.

User-defined Domain Names

You can bind a user-defined domain name to a bucket, and then use this domain name to access the objects hosted in the bucket. For more information, see **Accessing a Bucket Using a User-Defined Domain Name**.

NOTE

To protect your services from being affected by the takeover of Huawei Cloud public domain names by relevant organizations, you are advised to use a user-defined domain name to access a bucket.

Acceleration Domain Names

An acceleration domain name is a user-defined domain name that uses Content Delivery Network (CDN) to speed up content delivery. By using an acceleration domain name to access objects in a bucket, you can enjoy faster website access, file downloads, and on-demand services. For more information, see **Accessing a Bucket Using a CDN Acceleration Domain Name**.

Default Domain Names

OBS assigns each newly created bucket an access domain name (also the default domain name) based on the bucket name and region information.

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examplebucket.obs.ap-southeast-1.myhuaweicloud.com is an example default domain name. In this example, **examplebucket** is the bucket name and **obs.ap-southeast-1.myhuaweicloud.com** is the endpoint of the region where the bucket is located. For more information, see **OBS Domain Names**.

For security and compliance reasons, Huawei Cloud OBS does not allow you to use the default domain name of a bucket to preview objects in the bucket. After you upload a file to a bucket, OBS creates an access address for the uploaded file based on the bucket's default domain name. When you use this address to access the file in a browser, the file content is not displayed. Instead, the file is downloaded as an attachment.

The effective time and supported regions are as follows:

January 1, 2022: CN North-Beijing1, CN North-Beijing4, CN East-Shanghai1, CN East-Shanghai2, and CN South-Guangzhou

March 25, 2022: CN-Hong Kong, AP-Bangkok, AP-Singapore, AF-Johannesburg, LA-Mexico City1, LA-Mexico City2, LA-Sao Paulo1, AP-Jakarta, and LA-Santiago

7.2 Accessing a Bucket Using a User-Defined Domain Name

After you upload a file to a bucket, OBS generates an access address for the file that includes the bucket's default domain name. Accessing this address using a browser will automatically download the file. To avoid exposing the default domain name of a bucket or to preview files online through a browser, you can bind a user-defined domain name to the bucket and use it to access the files in the bucket.

Scenarios

- File preview: To avoid automatic file downloads, you can bind a user-defined domain name to a bucket for online file preview.
- Keeping the access address unchanged: To keep website or file access addresses unchanged after a migration or storage location change, you can upload the files to a bucket and bind a user-defined domain name to the bucket. This will establish a mapping between the website domain name and the default bucket domain name. In this way, you can still access the files using the original address.
- Improved brand image: Having a fixed and personalized domain name for accessing an enterprise website can make the enterprise appear more professional and reliable. This enhances enterprise image and improves customer experience.
- Easy access: You can use a user-defined domain name that is easy to remember to access a bucket and files in the bucket.
- Accessing .apk or .ipa files: For security and compliance purposes, OBS blocks downloads of .apk or .ipa files via a bucket's default domain name. However, these files can still be accessed through a user-defined domain name bound to the bucket.

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NOTE

When you download an .apk or .ipa file using a bucket's default domain name, OBS returns error code 400 and **InsecureDownloadForbidden**.

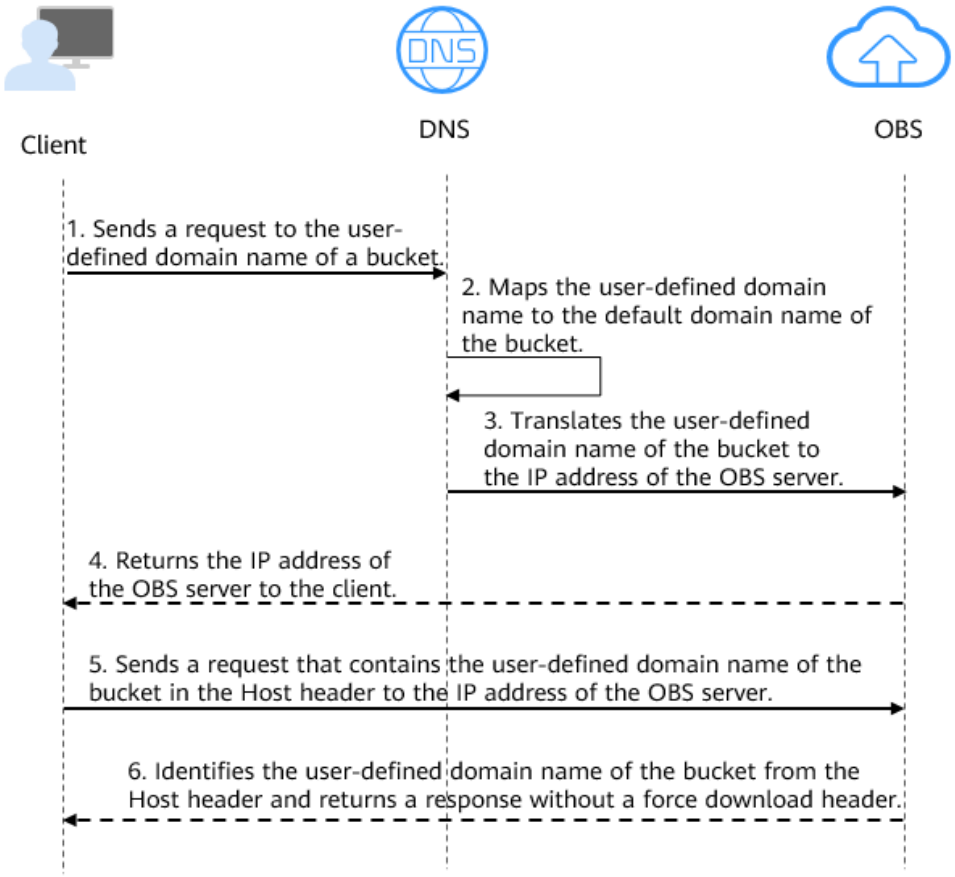
Principles

The following describes the process of accessing objects in a bucket using a user-defined domain name and the process of accessing objects in a bucket using the default bucket domain name.

Using a User-Defined Domain Name to Access Objects in a Bucket

Figure 7-1 shows the process of using a user-defined domain name to access objects in a bucket.

Figure 7-1 Using a user-defined domain name to access objects in a bucket



1. A user enters a file access address (that includes a user-defined domain name) in a browser to initiate an access request.
2. DNS maps the user-defined domain name to the default domain name of the bucket.
3. DNS translates the default domain name of the bucket to the IP address of the OBS server.

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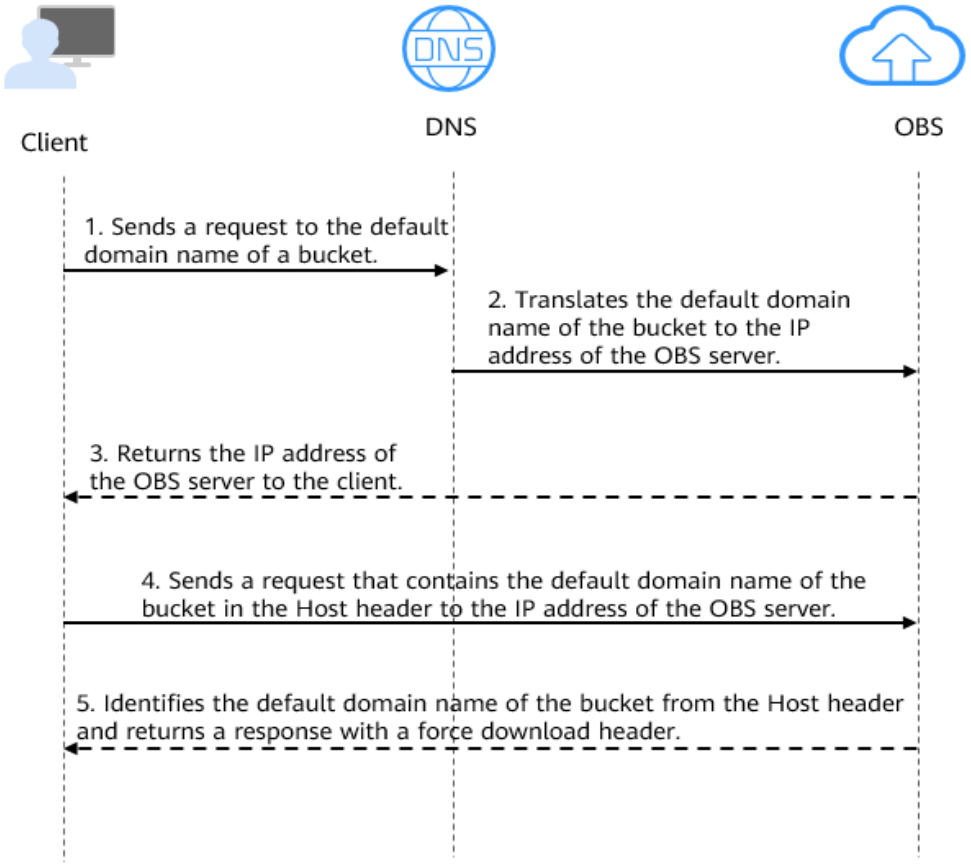
4. OBS returns the IP address of the server to the client.
5. The client sends a request with the user-defined domain name specified in the Host header to the IP address of the OBS server.
6. OBS identifies the user-defined domain name in the Host header and returns a response with **Content-Disposition** set to **inline** to the client, which indicates that the file is expected to be displayed in the browser.

Using a Bucket's Default Domain Name to Access Objects in the Bucket

Figure 7-2 shows the process of using a bucket's default domain name (*bucketName*.**obs.***endpoint*.**myhuaweicloud.com**) to access objects in the bucket.

Figure 7-2 Using a bucket's default domain name to access objects in the bucket



1. A user enters a file access address (that includes the default domain name of the bucket) in the browser to initiate an access request.
2. DNS translates the default domain name of the bucket to the IP address of the OBS server.
3. OBS returns the IP address of the server to the client.
4. The client sends a request with the default domain name specified in the Host header to the IP address of the OBS server.
5. OBS identifies the default domain name in the Host header and returns a response with **Content-Disposition** set to **attachment** to the client, which indicates that the file is expected to be downloaded and saved locally.

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Constraints

Table 7-1 Constraints

Item	Description
Bucket version	Only buckets whose version is 3.0 or later support user-defined domain names. To check the version of a bucket, go to OBS **Console**, click the bucket name to go to the **Overview** page, and find the version in the **Basic Information** area.
Number of domain names	By default, a bucket can have up to 20 user-defined domain names bound.
Functions	• A user-defined domain name can be bound to only one bucket. • Chinese domain names are not supported. • The suffix of a user-defined domain name can contain 2 to 6 uppercase or lowercase letters. • As required by the MIIT, if the bucket which a user-defined domain name is bound to is in a Chinese mainland region, you must complete the ICP filing. **NOTE** If an acceleration domain name is also required, to prevent objects in OBS buckets from being directly downloaded upon access, you need to perform other required operations after the user-defined domain name and the acceleration domain name have been configured. For details, see **With CDN Acceleration Enabled, Why Are the Objects in My OBS Bucket Directly Downloaded When I Access Them?**

Prerequisites

- There is a bucket with objects. For details, see **Creating a Bucket**.
- There is a second-level domain.
- As required by the MIIT, if the bucket which a user-defined domain name is bound to is in a Chinese mainland region, you must complete the ICP filing.

Configuring a User-Defined Domain Name

You can use **OBS Console**, APIs, or SDKs to configure user-defined domain names.

Specifically, perform the following steps:

1. **Bind a user-defined domain name** to the bucket.
2. **Add a CNAME record set** to map the user-defined domain name to the default domain name of the bucket.
3. **(Optional) Configure HTTPS** to secure access through the user-defined domain name.

Using OBS Console

Step 1: Bind a User-Defined Domain Name

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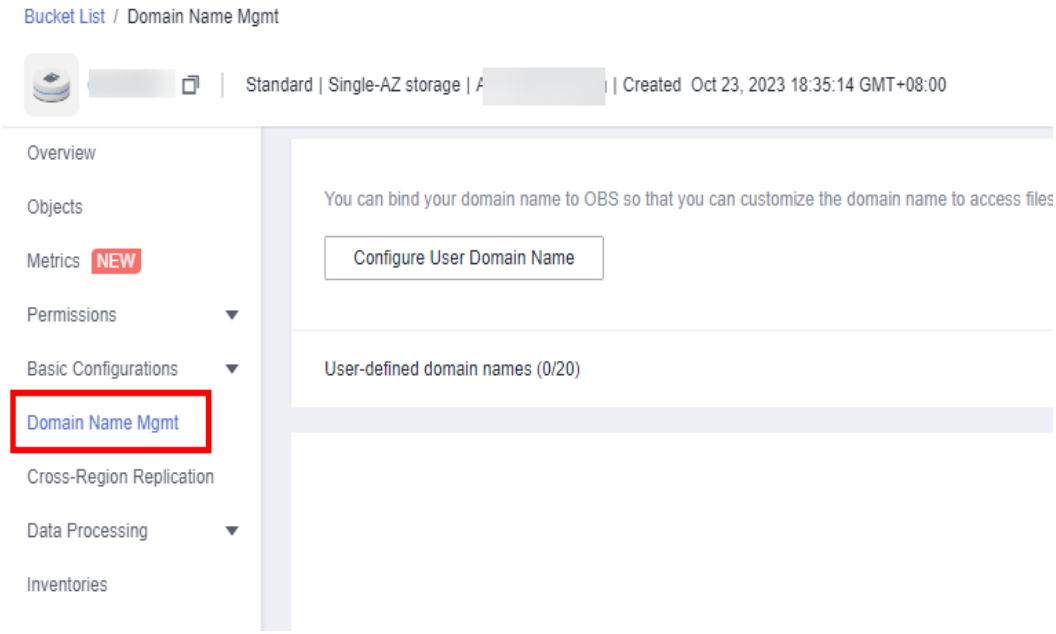
Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Basic Configurations** > **Domain Name Mgmt**.

Figure 7-3 Domain name management page



Step 4 Click **Configure User Domain Name** in the upper part of the page.

If no user-defined domain names are bound, you also can click **Configure User Domain Name** in the lower part of the page.

Figure 7-4 Configuring a user domain name

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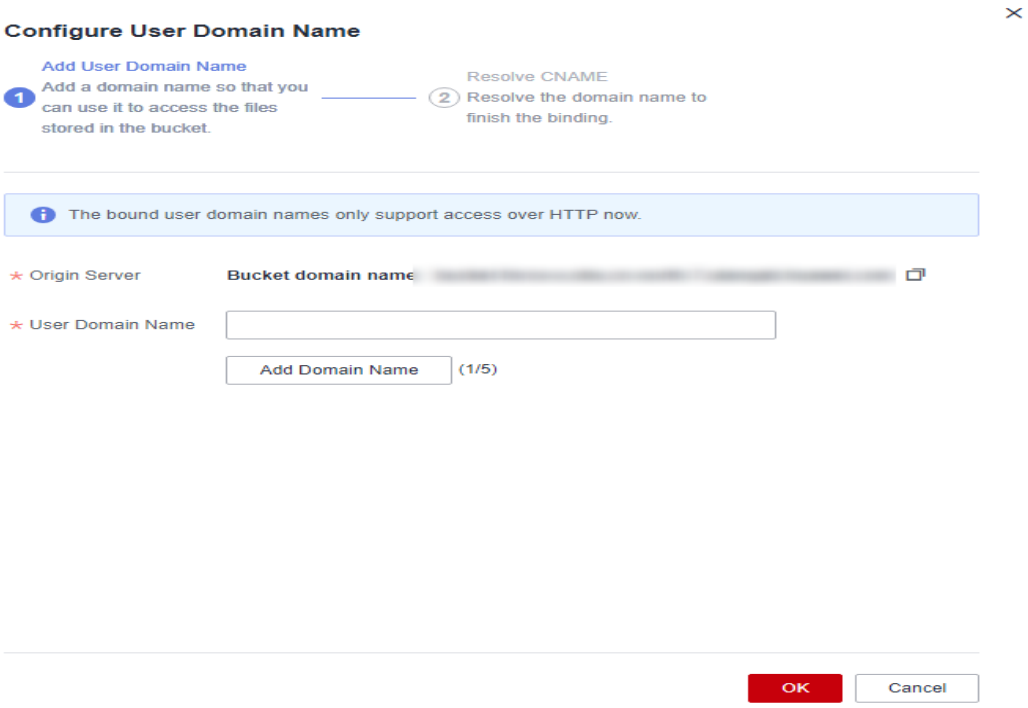

Step 5 Specify a user-defined domain name for **User Domain Name**.

The domain name:

- **Must start with an asterisk (*), a letter, or a digit.**
- **Can contain letters, digits, hyphens (-), and periods (.).**
- **Can have a suffix of 2 to 6 uppercase or lowercase letters, for example, .com and .cn.**

By default, a bucket can have up to 20 user-defined domain names bound.

NOTE

If you want to choose one of the existing Huawei Cloud domain names from the drop-down list on **OBS Console**, you must have the **Domains:domains:getDetails** permission. You can contact the administrator to use IAM to grant you this permission. For details, see **Assigning Permissions to an IAM User**.

Step 6 Click **OK**.

----End

Step 2: Add a CNAME Record Set

Add a CNAME record set to map the user-defined domain name to the default domain name of the bucket.

Step 1 Click **Resolve** to automatically add a CNAME record set.

- If you specified a Huawei Cloud domain name, click **Resolve** for DNS to add a CNAME record set.
- If you specified a domain name that is not registered with Huawei Cloud, skip this step and go to **Step 2**.

Step 2 Manually add a CNAME record set.

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- If you are **not using a Huawei Cloud domain name**, follow the CNAME resolution guide provided by your DNS provider.
- If you are **using a Huawei Cloud domain name**, do as follows:

  a. Log in to the **DNS console**.

  b. In the navigation pane, choose **Public Zones**.

  c. (Optional) Create a public zone. If you have already created one, skip this step.

     i. On the **Public Zones** page, click **Create Public Zone** in the upper right corner.

     ii. Configure parameters by referring to the following table. Retain the default settings for other parameters.

     Table 7-2 Parameters for creating a public zone

Parameter	Example Value	Description
Domain Name	example.com	The domain name purchased from a domain name registrar Enter the user-defined domain name bound to the bucket here.
Enterprise Project	default	The enterprise project to be associated with the public zone. You can manage public zones by enterprise project. This parameter is available and mandatory only when you are using an enterprise account. Notes: ○ If you do not manage zones by enterprise project, select the **default** enterprise project. ○ If you manage zones by enterprise project, select another existing enterprise project. To create an enterprise project, see **Creating an Enterprise Project**.

     iii. Click **OK**.

  d. Locate the row that contains the domain name to which you want to add a record set and click the domain name.

  e. On the **Record Sets** tab, click **Add Record Set**.

  f. Configure parameters by referring to **Table 7-3**. Keep the default settings for the parameters that are not listed in the following table.

     For details, see **Adding a CNAME Record Set**.

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Table 7-3 Parameters for adding a CNAME record set

Parameter	Example Value	Description
Type	CNAME – Map one domain to another	Choose a record set type depending on the purpose of the domain name. Select **CNAME – Map one domain to another** here. A message may be displayed, indicating that the record set you are trying to add conflicts with an existing record set of the zone. For details, see **Why Is a Message Indicating Conflict with an Existing Record Set Displayed When I Add a Record Set?**
Name	Leave it blank.	The prefix of the domain name to be resolved For example, if the domain name is **example.com**, its prefix can be: ■ **www**: used for website resolution. The domain name to be resolved is **www.example.com**. ■ Left blank: used for website resolution. The domain name to be resolved is **example.com**. To use an at sign (@), leave this parameter blank. ■ **abc**: The domain name to be resolved is **abc.example.com**, a subdomain of **example.com**. ■ **mail**: The domain name to be resolved is **mail.example.com**. ■ *: The domain name to be resolved is ***.example.com**, any subdomain of **example.com**.

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Parameter	Example Value	Description
Line	Default	Resolution line. The DNS server will return the IP address of the specified line, depending on where the visitor comes from. The default value is **Default**. This parameter can only be configured for public zone record sets. ▪ **Default**: returns the default resolution result irrespective of where the visitors come from. ▪ **ISP**: returns the resolution result based on visitors' carrier networks. For details, see **Configuring ISP Lines**. ▪ **Region**: returns the resolution result based on visitors' geographical locations. For details, see **Configuring Region Lines**. ▪ **Custom line**: returns a specific IP address based on the IP address range of visitors. For details, see **Configuring Custom Lines**.
TTL (s)	300	The length of time (in seconds) for which a local DNS server caches a record set The default value is **300** (value range: **1** to **2147483647**). If your service address changes frequently, set **TTL** to a smaller value. Otherwise, set **TTL** to a larger value. For more information about TTL, see **What Is TTL?**

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Parameter	Example Value	Description
Value	**example-bucket.obs.cn-north-4.myhuaweicloud.com**	Domain name alias. You can enter only one domain name. ■ If CDN acceleration is not used, set this parameter to the bucket domain name. ■ If CDN acceleration is used, set this parameter to the domain name specified in the CNAME record allocated by CDN.

g. Click **OK**.

h. Verify that the added CNAME record set is in effect.

Open the Windows command line interface and run the following command:

```
nslookup -qt=cname User-defined domain name or CDN acceleration domain name configured for the bucket
```

- Without CDN acceleration: If the output is the bucket domain name, the CNAME record set is in effect.
- With CDN acceleration: If the output is the CNAME domain name allocated by CDN, the CNAME record set is in effect.

----End

Step 3: (Optional) Configure HTTPS

Step 1 On OBS Console, open the **Configure User Domain Name** dialog box and click **Next** under the **Resolve CNAME** step.

Step 2 (Optional) On the **(Recommended) Configure HTTPS** page, if you do not need to configure HTTPS, click **OK** in the lower right corner.

Step 3 (Optional) If you need to configure HTTPS, set the parameters according to **Table 7-4**.

Table 7-4 Configuring HTTPS for a user-defined domain name

Parameter	Description
Custom domain name	Select the custom domain name for which you want to configure an HTTPS certificate.

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Parameter	Description
Certificate	Select an SCM certificate, a server digital certificate provided by Cloud Certificate & Manager (CCM). • If you do not have a certificate, click **Buy Certificate** to purchase one on the **CCM console**. For details, see **Purchasing an SSL Certificate**. • If you want to use your own certificate, upload it on the **SSL Certificates page of the CCM console**. For details, see **Uploading an External Certificate to SCM**. **Each certificate has an expiration time. Ensure that the certificate you chose has not expired.** **Replace the certificate before it expires, or services may be affected.**

Step 4 Click **Configure** in the lower right corner.

----End

Using APIs

Configuring a Custom Domain Name for a Bucket

Using SDKs

Java: not supported	Python: not supported	C	Go	BrowserJS: not supported	.NET: not supported	Android: not supported	iOS: not supported	PHP: not supported	Node.js: not supported

Using a User-Defined Domain Name to Access Objects

After a user-defined domain name is bound to a bucket and the domain name resolution is successful, verify that you can use the domain name to access objects. You can use SDKs to access objects via the user-defined domain name, but you cannot use OBS console, APIs, OBS Browser+, or obsutil.

Using SDKs

Step 1 Obtain a pre-signed URL.

The following are example codes in common programming languages:

- Java

```
import com.obs.services.ObsClient;
import com.obs.services.ObsConfiguration;
import com.obs.services.model.HttpMethodEnum;
import com.obs.services.model.TemporarySignatureRequest;
```

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```
import com.obs.services.model.TemporarySignatureResponse;
public class GetObject001 {
    public static void main(String[] args) {
        // Obtain an AK/SK pair using environment variables or import it in other ways. Using hard coding may result in leakage.
        // Obtain an AK/SK pair on the management console.
        String ak = System.getenv("ACCESS_KEY_ID");
        String sk = System.getenv("SECRET_ACCESS_KEY_ID");
        // (Optional) If you are using a temporary AK/SK pair and a security token to access OBS, you are advised not to use hard coding, which may result in information leakage.
        // Obtain an AK/SK pair and a security token using environment variables or import them in other ways. If you use a temporary AK/SK pair and a security token to make an API call, uncomment the following line.
        // String securityToken = System.getenv("SECURITY_TOKEN");

        // Set the endpoint to the bucket's user-defined domain name. If the user-defined domain name has a certificate configured, you can use https.
        String endPoint = "http://example.domain";
        // Obtain an endpoint using environment variables or import it in other ways.
        //String endPoint = System.getenv("ENDPOINT");

        ObsConfiguration obsConfiguration = new ObsConfiguration();
        obsConfiguration.setCname(true);
        obsConfiguration.setEndPoint(endPoint);
        try {
            // Create an ObsClient instance.
            // Use the permanent AK/SK pair to initialize the client.
            ObsClient obsClient = new ObsClient(ak, sk, obsConfiguration);
            // Use a temporary AK/SK pair and security token to initialize the client.
            // ObsClient obsClient = new ObsClient(ak, sk, securityToken, obsConfiguration);

            // Set the validity period of the URL to 3600 seconds.
            long expireSeconds = 3600L;
            TemporarySignatureRequest request = new TemporarySignatureRequest(HttpMethodEnum.GET, expireSeconds);
            request.setBucketName("examplebucket");
            request.setObjectKey("objectname");
            TemporarySignatureResponse response = obsClient.createTemporarySignature(request);
            System.out.println("Getting object using temporary signature url:");
            System.out.println("SignedUrl:" + response.getSignedUrl());
        } catch (Exception e) {
            System.out.println("create temporary signature failed");
            e.printStackTrace();
        }
    }
}
```

- Python

```
from obs import ObsClient
import os
import traceback
# Obtain an AK and SK pair using environment variables (recommended) or import it in other ways. Using hard coding may result in leakage.
# Obtain an AK/SK pair on OBS Console by referring to https://support.huaweicloud.com/en-us/usermanual-ca/ca_01_0003.html.
ak = os.getenv("AccessKeyID")
sk = os.getenv("SecretAccessKey")
# (Optional) If you use a temporary AK/SK pair and a security token to access OBS, obtain them using environment variables.
# security_token = os.getenv("SecurityToken")
# Set the server to the bucket's user-defined domain name. If the user-defined domain name has a certificate configured, you can use https.
server = "http://example.domain"
# Create an ObsClient instance.
obsClient = ObsClient(access_key_id=ak, secret_access_key=sk, server=server, is_cname=True)

# If you use a temporary AK/SK pair and a security token to access OBS, you must specify security_token when creating an instance.
#obsClient = ObsClient(access_key_id=ak, secret_access_key=sk, security_token=security_token, server=server, is_cname=True)
```

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```
try:
    # Create a signed URL for downloading an object.
    res = obsClient.createSignedUrl(method='GET', bucketName='bucketname', objectKey='objectkey',
expires=3600)
    print('signedUrl:', res.signedUrl)
except:
    print(traceback.format_exc())
```

Step 2 Access the pre-signed URL in a browser.

----End

References

Using CDN Acceleration to Accelerate Access

To improve the speed and stability for accessing static resource files, you can use CDN acceleration. If you have configured a user-defined domain name for a bucket, you can directly enable CDN acceleration for the domain name. If you have not configured a user-defined domain name for the bucket, you can configure a CDN acceleration domain name. For details, see **Accessing a Bucket Using a CDN Acceleration Domain Name**.

You can also manage HTTPS certificates on the CDN console to allow access over HTTPS. For details, see **Configuring an HTTPS Certificate**.

Using a Permanent, Unsigned URL to Access an Object

WARNING

- To obtain a permanent, unsigned URL (**http://***DomainName***/***ObjectName*) for accessing a file, you must set the file to be publicly readable. Once the file is publicly accessible, anyone can access it, which may lead to data leakage and soaring costs from frequent requests. Therefore, it is recommended to use signed URLs with an expiration time to access files.
- If you allow your file to be accessed by a permanent, unsigned URL, you should configure **URL validation** to prevent the file from being stolen.

You can set an object to be publicly readable in either of the following ways:

- Grant anonymous users the read permission for the object and share the object URL with them. The anonymous users then can use the shared URL to access the object. For details, see **Granting Anonymous Users the Public Read Permission for Objects**.
- **Enable acceleration for the configured user-defined domain name** and keep the OBS object private. This uses CDN to provide public read access. In such cases, the object URL does not require signature authentication and does not have an expiration time. Anonymous users can access the object.

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Preventing Data Theft

Some rogue websites may steal links from other websites to enrich their content without any costs. Link stealing hurts the interests of the original websites and it is also a strain on their servers. URL validation is designed to address this issue.

To prevent data stored in buckets from being theft, you can specify Referer (a whitelisted, blacklisted, or empty Referer) in the HTTP header to allow access only from specific sources. For details, see **Configuring URL Validation to Prevent Unauthorized Access to Your Data**.

Configuring Static Website Hosting

If you want to host your static website on OBS and use a user-defined domain name to access the website, you need to configure static website hosting for the storage space. For details, see **Static Website Hosting**.

FAQ

- **How Do I Preview Objects in OBS in a Browser Online?**
- **Why Is the Message "NoSuchBucket" Displayed When I Use a User-Defined Domain Name to Access a Bucket That Can Be Accessed by the OBS Domain Name?**
- **Why Is the CNAME Resolution Status Unknown?**
- **Why Can Only the Domain Names I Bought on Huawei Cloud Be Automatically Resolved?**

7.3 Accessing a Bucket Using a CDN Acceleration Domain Name

Scenarios

More and more companies in various industries use OBS to store static resource files such as images, videos, and software packages, and use OBS as the storage source for websites, forums, apps, and games. These static resources can be obtained by accessing OBS through URLs. Generally, files are stored in only one region. If you access OBS far away from the region where files are stored, the response speed may be slow. In scenarios where frequent access is required, accessing OBS to obtain files consumes a large amount of traffic.

To improve the speed and stability for accessing static resource files, you can use CDN acceleration. If you have configured a user-defined domain name for a bucket, you can directly enable CDN acceleration for the domain name. If you have not configured a user-defined domain name for the bucket, you can configure a CDN acceleration domain name.

CDN acceleration applies to the following scenarios:

- **Website acceleration**

  When static resources (such as images and files) on portals, e-commerce platforms, or user-generated content (UGC) apps are accessed by large or

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globally distributed user bases, CDN acceleration can make the responses faster.

- **Download acceleration**

  CDN acceleration enables higher bandwidth and faster transmission, which reduces the time required for downloading files from websites, game clients, or app stores.

- **On-demand service acceleration**

  In scenarios, such as online education and video sharing, that offer video on demand (VOD) and audio on demand (AOD) services, CDN acceleration can minimize playback buffering.

For details, see **Application Scenarios**.

Video Tutorial

This video shows how to configure a CDN acceleration domain name for an OBS bucket:

1. On **OBS Console**, bind an acceleration domain name to the OBS bucket.
2. On the **DNS console**, add a CNAME record set.

Billing for CDN-Accelerated Access to OBS

If you use Huawei Cloud CDN to accelerate access to the data stored in OBS, you will be billed for using both OBS and CDN.

Figure 7-5 shows how and what costs are generated.

Figure 7-5 Using CDN to access OBS

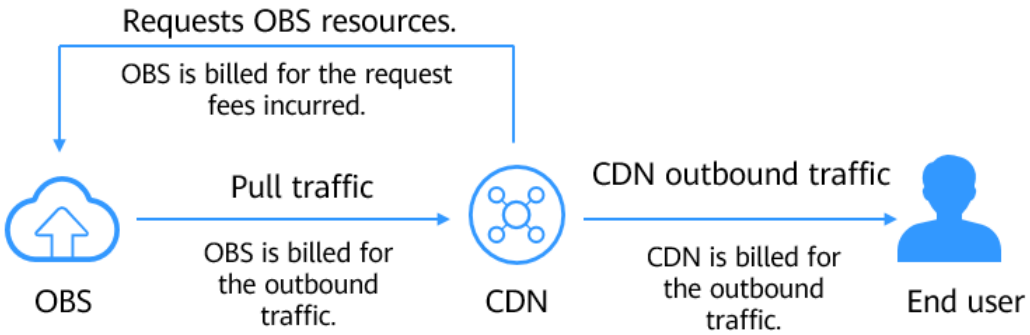

Table 7-5 describes the billing items in detail.

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Table 7-5 Billing items for accessing OBS via CDN acceleration

Billing Item	Billing Party	Description	Billing Mode
Requests	OBS	When you attempt to access data the first time, a CDN edge PoP will send requests to pull data from the origin server (OBS). OBS bills you for the requests, also the number of API calls.	Pay-per-Use
CDN pull traffic	OBS	Pull traffic generated when the origin server (OBS 3.0 bucket) returns data and caches it on the CDN edge PoP. If **Direct Connect** is used, the price will be different. For details, see **Product Pricing Details**. Such traffic is only generated for OBS 3.0 buckets. If data is pulled from OBS 2.0 buckets, the data is directly transferred out over the Internet.	Pay-per-Use
CDN traffic	CDN	Outbound traffic generated when you access a CDN edge PoP. For details, see **Billing by Traffic**.	Pay-per-Use Resource packages (**prepaid CDN traffic packages**)

Principles

Accessing OBS without CDN acceleration: Files are stored in only one region. Therefore, when a client accesses OBS far away from the region, the response speed may be slow.

Accessing OBS with CDN acceleration: When a client initiates a request, CDN searches for the CDN PoP that responds the fastest to the domain name and checks whether the CDN PoP has already cached the data requested by the client.

- If cached, the CDN PoP returns the data to the client.
- If not, the CDN PoP pulls the data from OBS, returns the data to the client, and caches the data on itself.

The CDN acceleration service can speed up response and improve user experience at low costs.

The following explains how a client accesses OBS without and with CDN acceleration.

Accessing OBS Without CDN Acceleration

Figure 7-6 shows the process of accessing OBS directly from clients without CDN acceleration.

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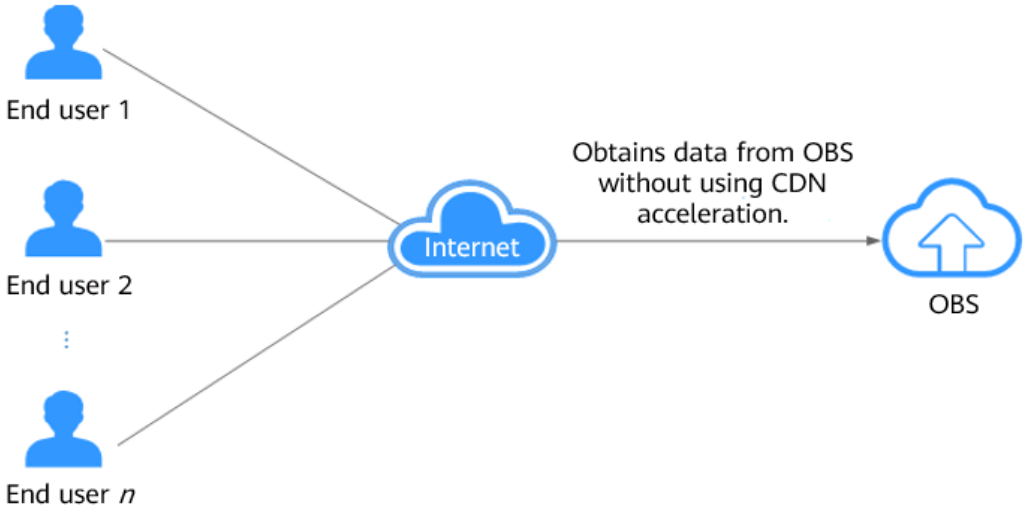
Figure 7-6 Process of obtaining data from OBS



Accessing OBS with CDN Acceleration (Without Cached Data on the CDN PoP)

When a client initiates a request, CDN searches for the CDN PoP that responds the fastest to the domain name and detects that the requested data is not cached on the PoP. Then, the CDN PoP pulls the data from OBS, returns the data to the client, and caches the data on itself. **Figure 7-7** shows the request process.

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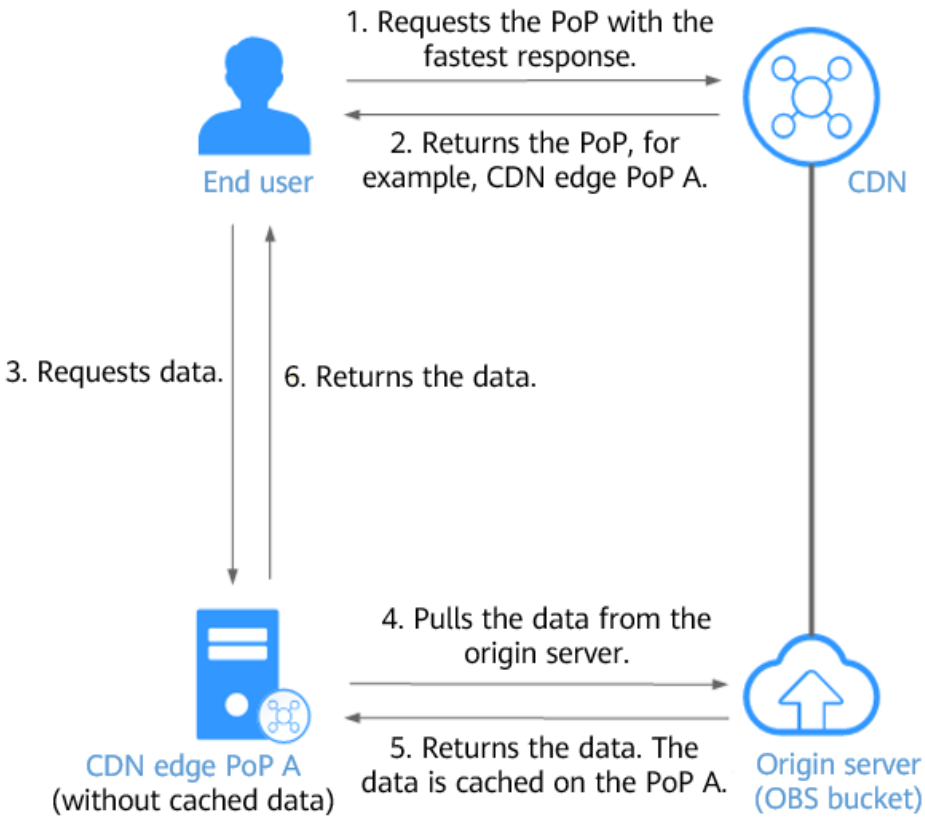
Figure 7-7 Accessing OBS with CDN acceleration (without cached data on the CDN PoP)



Accessing OBS with CDN Acceleration (with Cached Data on the CDN PoP)

When a client initiates a request, CDN searches for the CDN PoP that responds the fastest to the domain name and detects that the requested data is cached on the PoP. Then, the CDN PoP returns the data to the client, without pulling data from OBS. **Figure 7-8** shows the request process.

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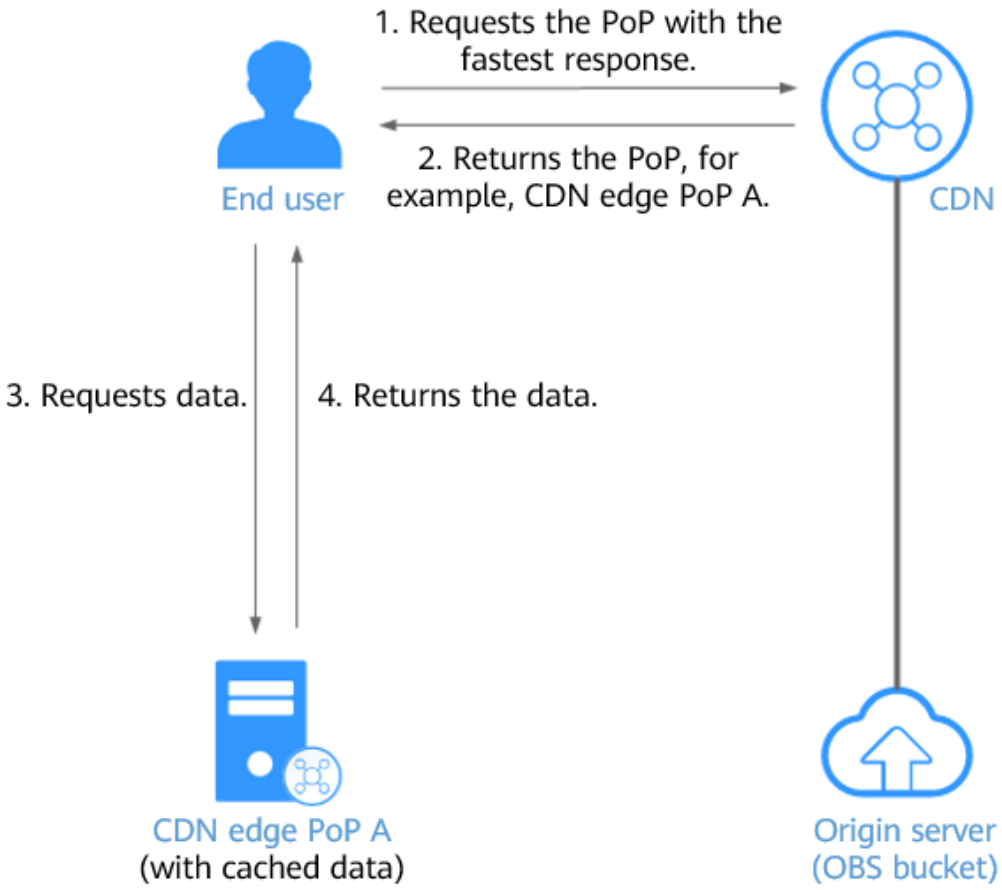
Figure 7-8 Accessing OBS with CDN acceleration (with cached data on the CDN PoP)



Constraints

Only buckets whose version is 3.0 or later support CDN acceleration. To check the version of a bucket, go to OBS **Console**, click the bucket name to go to the **Overview** page, and find the version in the **Basic Information** area.

Configuring an Acceleration Domain Name

You can use **OBS Console** to configure acceleration domain names.

To configure an acceleration domain name on **OBS Console**, perform the following steps:

1. **Bind an acceleration domain name** to the bucket.
2. **Add a CNAME record set** to map the acceleration domain name to the default domain name of the bucket.

Step 1: Bind an Acceleration Domain Name

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

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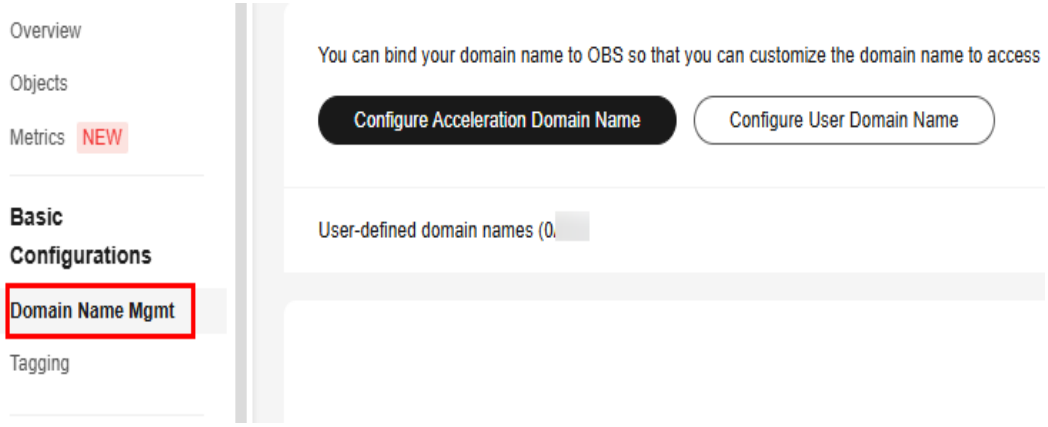
Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Basic Configurations** > **Domain Name Mgmt**.

Figure 7-9 Domain name management page



Step 4 In the upper part of the page, click **Configure Acceleration Domain Name**.

If no user-defined domain names are bound, you also can click **Configure Acceleration Domain Name** in the lower part of the page.

NOTE

If CDN has not been enabled, a dialog box is displayed after you click **Configure Acceleration Domain Name**. Enable CDN as prompted.

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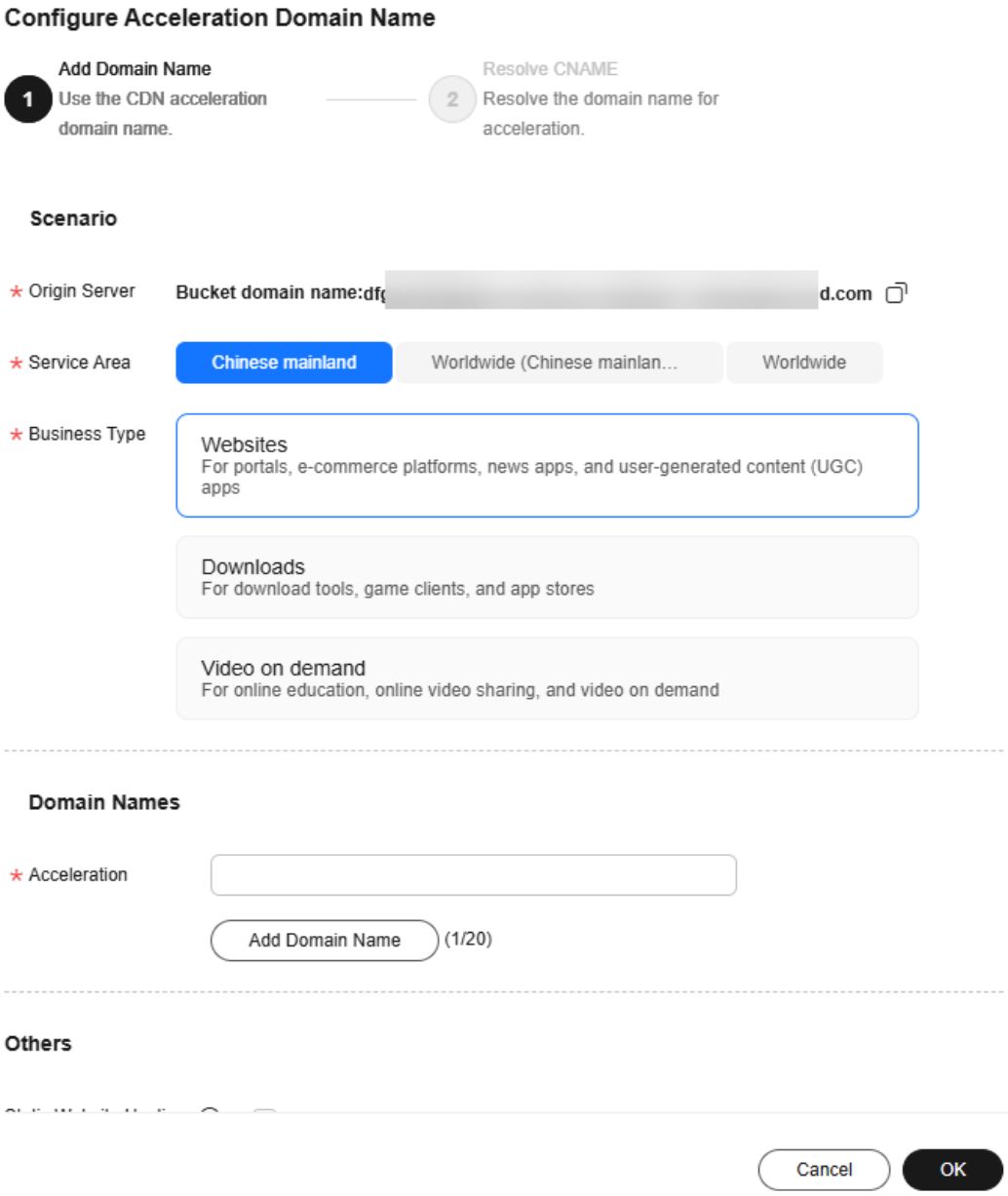
Figure 7-10 Configuring an acceleration domain name



Step 5 Configure parameters by referring to **Table 7-6**.

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Table 7-6 Parameters for adding an acceleration domain name

Parameter	Value	Description	Example Value
Origin Server	-	The origin server (the default domain name of the OBS bucket that stores the requested resources) that is accessed by the client using the acceleration domain name This parameter is displayed by default and requires no configuration.	-
Service Area	Chinese mainland	If you select **Chinese mainland**, all requests are scheduled to CDN PoPs in the Chinese mainland. The acceleration domain name must be licensed by the MIIT. For details, see **ICP Filing Process**.	Worldwide
	Outside of Chinese mainland	If you select **Outside of Chinese mainland**, all requests are scheduled to CDN PoPs outside the Chinese mainland. You do not need to apply for a license for the acceleration domain name from the MIIT.	
	Worldwide	If you select **Worldwide**, worldwide requests are scheduled to the nearest, optimal CDN PoP. The acceleration domain name must be licensed by the MIIT. For details, see **ICP Filing Process**.	
Business Type	Websites	When static resources (such as images and files) on portals, e-commerce platforms, or user-generated content (UGC) apps are accessed by large or globally distributed user bases, CDN acceleration can make the responses faster.	Websites
	Downloads	CDN acceleration enables higher bandwidth and faster transmission, which reduces the time required for downloading files from websites, game clients, or app stores.	
	Video on demand	In scenarios, such as online education and video sharing, that offer video on demand (VOD) and audio on demand (AOD) services, CDN acceleration can minimize playback buffering.	

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Parameter	Value	Description	Example Value
Acceleration	-	The user-defined domain name to be accelerated • **The domain name:** – Must start with an asterisk (*), a letter, or a digit. – Can contain letters, digits, hyphens (-), and periods (.). – Can have a suffix of 2 to 6 uppercase or lowercase letters, for example, **.com** and **.cn**. • **The ownership of the domain name must be verified.** To prevent domain names from being maliciously added, you need to verify the ownership of the domain name the first time you connect a domain name to CDN. For details, see **Verifying the Domain Name Ownership**. • You can add up to five domain names at a time. **NOTE** If you want to choose one of the existing Huawei Cloud domain names from the drop-down list on **OBS Console**, you must have the **Domains:domains:getDetails** permission. You can contact the administrator to use IAM to grant you this permission. For details, see **Assigning Permissions to an IAM User**.	static.example.com

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Parameter	Value	Description	Example Value
Static Website Hosting	-	You can upload static website files to your OBS bucket and grant anonymous users the read permission for these files, and then configure static website hosting for the bucket, so that OBS can host your static website. For details, see **Static Website Hosting**. • If you have configured static website hosting for your OBS bucket, select **Enable** for **Static Website Hosting**. This way, when you access a single static file in the bucket, OBS does not list all files in the bucket. You also need to select **Static website hosting** on the origin server settings page of the CDN console. For details, see **Why Are All Files in the Bucket Displayed When Users Request a File from an OBS Bucket Connected to CDN?** • If static website hosting is not configured for your OBS bucket, do not enable this option. Otherwise, services will be abnormal.	-

Step 6 Click **OK**.

----End

Step 2: Add a CNAME Record Set

Add a CNAME record set to map the user-defined domain name to the default domain name of the bucket.

Step 1 Click **Resolve** to automatically add a CNAME record set.

- If you specified a Huawei Cloud domain name, click **Resolve** for DNS to add a CNAME record set.
- If you specified a domain name that is not registered with Huawei Cloud, skip this step and go to **Step 2**.

Step 2 Manually add a CNAME record set.

- If you are **not using a Huawei Cloud domain name**, follow the CNAME resolution guide provided by your DNS provider.

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- If you are **using a Huawei Cloud domain name**, do as follows:
  a. Log in to the **DNS console**.
  b. In the navigation pane, choose **Public Zones**.
  c. (Optional) Create a public zone. If you have already created one, skip this step.
     i. On the **Public Zones** page, click **Create Public Zone** in the upper right corner.
     ii. Configure parameters by referring to the following table. Retain the default settings for other parameters.

     Table 7-7 Parameters for creating a public zone

Parameter	Example Value	Description
Domain Name	example.com	The domain name purchased from a domain name registrar Enter the user-defined domain name bound to the bucket here.
Enterprise Project	default	The enterprise project to be associated with the public zone. You can manage public zones by enterprise project. This parameter is available and mandatory only when you are using an enterprise account. Notes: ○ If you do not manage zones by enterprise project, select the **default** enterprise project. ○ If you manage zones by enterprise project, select another existing enterprise project. To create an enterprise project, see **Creating an Enterprise Project**.

     iii. Click **OK**.
  d. Locate the row that contains the domain name to which you want to add a record set and click the domain name.
  e. On the **Record Sets** tab, click **Add Record Set**.
  f. Configure parameters by referring to **Table 7-8**. Keep the default settings for the parameters that are not listed in the following table.
     For details, see **Adding a CNAME Record Set**.

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Table 7-8 Parameters for adding a CNAME record set

Parameter	Example Value	Description
Type	CNAME – Map one domain to another	Choose a record set type depending on the purpose of the domain name. Select **CNAME – Map one domain to another** here. A message may be displayed, indicating that the record set you are trying to add conflicts with an existing record set of the zone. For details, see **Why Is a Message Indicating Conflict with an Existing Record Set Displayed When I Add a Record Set?**
Name	Leave it blank.	The prefix of the domain name to be resolved For example, if the domain name is **example.com**, its prefix can be: ■ **www**: used for website resolution. The domain name to be resolved is **www.example.com**. ■ Left blank: used for website resolution. The domain name to be resolved is **example.com**. To use an at sign (@), leave this parameter blank. ■ **abc**: The domain name to be resolved is **abc.example.com**, a subdomain of **example.com**. ■ **mail**: The domain name to be resolved is **mail.example.com**. ■ *: The domain name to be resolved is ***.example.com**, any subdomain of **example.com**.

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Parameter	Example Value	Description
Line	Default	Resolution line. The DNS server will return the IP address of the specified line, depending on where the visitor comes from. The default value is **Default**. This parameter can only be configured for public zone record sets. ▪ **Default**: returns the default resolution result irrespective of where the visitors come from. ▪ **ISP**: returns the resolution result based on visitors' carrier networks. For details, see **Configuring ISP Lines**. ▪ **Region**: returns the resolution result based on visitors' geographical locations. For details, see **Configuring Region Lines**. ▪ **Custom line**: returns a specific IP address based on the IP address range of visitors. For details, see **Configuring Custom Lines**.
TTL (s)	300	The length of time (in seconds) for which a local DNS server caches a record set The default value is **300** (value range: **1** to **2147483647**). If your service address changes frequently, set **TTL** to a smaller value. Otherwise, set **TTL** to a larger value. For more information about TTL, see **What Is TTL?**

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Parameter	Example Value	Description
Value	**example-bucket.obs.cn-north-4.myhuaweicloud.com**	Domain name alias. You can enter only one domain name. ■ If CDN acceleration is not used, set this parameter to the bucket domain name. ■ If CDN acceleration is used, set this parameter to the domain name specified in the CNAME record allocated by CDN.

g. Click **OK**.

h. Verify that the added CNAME record set is in effect.

Open the Windows command line interface and run the following command:

```
nslookup -qt=cname User-defined domain name or CDN acceleration domain name configured for the bucket
```

- Without CDN acceleration: If the output is the bucket domain name, the CNAME record set is in effect.
- With CDN acceleration: If the output is the CNAME domain name allocated by CDN, the CNAME record set is in effect.

----End

NOTE

After the domain name is configured, CDN acceleration is not applied immediately. Refresh the domain name list to check the status. CDN acceleration is in effect only when the CNAME status is **Enabled**.

Enabling Acceleration for a User-Defined Domain Name

You can use **OBS Console** to enable acceleration for a user-defined domain name that has been configured for the bucket.

To enable acceleration on **OBS Console**, perform the following steps:

1. **Enable acceleration** for the bound user-defined domain name.
2. **Add a CNAME record set** to map the acceleration domain name to the default domain name of the bucket.

Step 1: Enable Acceleration

Step 1 In the domain name list, locate the card of the bound domain name and click **Enable** next to **Acceleration disabled**.

Step 2 Configure parameters by referring to **Table 7-9**.

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Table 7-9 Acceleration domain name parameters

Parameter	Value	Description	Example Value
Origin Server	-	The origin server (the default domain name of the OBS bucket that stores the requested resources) that is accessed by the client using the acceleration domain name This parameter is displayed by default and requires no configuration.	-
Service Area	Chinese mainland	If you select **Chinese mainland**, all requests are scheduled to CDN PoPs in the Chinese mainland. The acceleration domain name must be licensed by the MIIT. For details, see **ICP Filing Process**.	Worldwide
	Outside of Chinese mainland	If you select **Outside of Chinese mainland**, all requests are scheduled to CDN PoPs outside the Chinese mainland. You do not need to apply for a license for the acceleration domain name from the MIIT.	
	Worldwide	If you select **Worldwide**, worldwide requests are scheduled to the nearest, optimal CDN PoP. The acceleration domain name must be licensed by the MIIT. For details, see **ICP Filing Process**.	
Business Type	Websites	When static resources (such as images and files) on portals, e-commerce platforms, or user-generated content (UGC) apps are accessed by large or globally distributed user bases, CDN acceleration can make the responses faster.	Websites
	Downloads	CDN acceleration enables higher bandwidth and faster transmission, which reduces the time required for downloading files from websites, game clients, or app stores.	
	Video on demand	In scenarios, such as online education and video sharing, that offer video on demand (VOD) and audio on demand (AOD) services, CDN acceleration can minimize playback buffering.	

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Parameter	Value	Description	Example Value
Acceleration	-	The user-defined domain name to be accelerated This parameter is displayed by default and requires no configuration. To prevent domain names from being maliciously added, you need to verify the ownership of the domain name the first time you connect a domain name to CDN. For details, see **Verifying the Domain Name Ownership**.	static.example.com
Static Website Hosting	-	You can upload static website files to your OBS bucket and grant anonymous users the read permission for these files, and then configure static website hosting for the bucket, so that OBS can host your static website. For details, see **Static Website Hosting**. • If you have configured static website hosting for your OBS bucket, select **Enable** for **Static Website Hosting**. This way, when you access a single static file in the bucket, OBS does not list all files in the bucket. You also need to select **Static website hosting** on the origin server settings page of the CDN console. For details, see **Why Are All Files in the Bucket Displayed When Users Request a File from an OBS Bucket Connected to CDN?** • If static website hosting is not configured for your OBS bucket, do not enable this option. Otherwise, services will be abnormal.	-

Step 3 Click **OK**.

----End

Step 2: Add a CNAME Record Set

Add a CNAME record set to map the user-defined domain name to the default domain name of the bucket.

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Step 1 Click **Resolve** to automatically add a CNAME record set.

- If you specified a Huawei Cloud domain name, click **Resolve** for DNS to add a CNAME record set.
- If you specified a domain name that is not registered with Huawei Cloud, skip this step and go to **Step 2**.

Step 2 Manually add a CNAME record set.

- If you are **not using a Huawei Cloud domain name**, follow the CNAME resolution guide provided by your DNS provider.
- If you are **using a Huawei Cloud domain name**, do as follows:
  a. Log in to the **DNS console**.
  b. In the navigation pane, choose **Public Zones**.
  c. (Optional) Create a public zone. If you have already created one, skip this step.
     i. On the **Public Zones** page, click **Create Public Zone** in the upper right corner.
     ii. Configure parameters by referring to the following table. Retain the default settings for other parameters.

Table 7-10 Parameters for creating a public zone

Parameter	Example Value	Description
Domain Name	example.com	The domain name purchased from a domain name registrar Enter the user-defined domain name bound to the bucket here.
Enterprise Project	default	The enterprise project to be associated with the public zone. You can manage public zones by enterprise project. This parameter is available and mandatory only when you are using an enterprise account. Notes: ○ If you do not manage zones by enterprise project, select the **default** enterprise project. ○ If you manage zones by enterprise project, select another existing enterprise project. To create an enterprise project, see **Creating an Enterprise Project**.

     iii. Click **OK**.
  d. Locate the row that contains the domain name to which you want to add a record set and click the domain name.

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e. On the **Record Sets** tab, click **Add Record Set**.

f. Configure parameters by referring to **Table 7-11**. Keep the default settings for the parameters that are not listed in the following table.

For details, see **Adding a CNAME Record Set**.

Table 7-11 Parameters for adding a CNAME record set

Parameter	Example Value	Description
Type	CNAME – Map one domain to another	Choose a record set type depending on the purpose of the domain name. Select **CNAME – Map one domain to another** here. A message may be displayed, indicating that the record set you are trying to add conflicts with an existing record set of the zone. For details, see **Why Is a Message Indicating Conflict with an Existing Record Set Displayed When I Add a Record Set?**
Name	Leave it blank.	The prefix of the domain name to be resolved For example, if the domain name is **example.com**, its prefix can be: ■ **www**: used for website resolution. The domain name to be resolved is **www.example.com**. ■ Left blank: used for website resolution. The domain name to be resolved is **example.com**. To use an at sign (@), leave this parameter blank. ■ **abc**: The domain name to be resolved is **abc.example.com**, a subdomain of **example.com**. ■ **mail**: The domain name to be resolved is **mail.example.com**. ■ *: The domain name to be resolved is ***.example.com**, any subdomain of **example.com**.

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Parameter	Example Value	Description
Line	Default	Resolution line. The DNS server will return the IP address of the specified line, depending on where the visitor comes from. The default value is **Default**. This parameter can only be configured for public zone record sets. ▪ **Default**: returns the default resolution result irrespective of where the visitors come from. ▪ **ISP**: returns the resolution result based on visitors' carrier networks. For details, see **Configuring ISP Lines**. ▪ **Region**: returns the resolution result based on visitors' geographical locations. For details, see **Configuring Region Lines**. ▪ **Custom line**: returns a specific IP address based on the IP address range of visitors. For details, see **Configuring Custom Lines**.
TTL (s)	300	The length of time (in seconds) for which a local DNS server caches a record set The default value is **300** (value range: **1** to **2147483647**). If your service address changes frequently, set **TTL** to a smaller value. Otherwise, set **TTL** to a larger value. For more information about TTL, see **What Is TTL?**

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Parameter	Example Value	Description
Value	**example-bucket.obs.cn-north-4.myhuaweicloud.com**	Domain name alias. You can enter only one domain name. ■ If CDN acceleration is not used, set this parameter to the bucket domain name. ■ If CDN acceleration is used, set this parameter to the domain name specified in the CNAME record allocated by CDN.

g. Click **OK**.

h. Verify that the added CNAME record set is in effect.

Open the Windows command line interface and run the following command:

```
nslookup -qt=cname User-defined domain name or CDN acceleration domain name configured for the bucket
```

- Without CDN acceleration: If the output is the bucket domain name, the CNAME record set is in effect.
- With CDN acceleration: If the output is the CNAME domain name allocated by CDN, the CNAME record set is in effect.

----End

NOTE

After the domain name is configured, CDN acceleration is not applied immediately. Refresh the domain name list to check the status. CDN acceleration is in effect only when the CNAME status is **Enabled**.

Accessing an Acceleration Domain Name over HTTPS

CDN supports HTTPS acceleration. You can configure an HTTPS certificate for an acceleration domain name on the **CDN console**. After the certificate is configured, clients can access CDN PoPs over HTTPS. For details, see **Configuring an HTTPS Certificate**.

FAQ

- **How Do I Preview OBS Objects in My Web Browser?**
- **With CDN Acceleration Enabled, Why Are the Objects in My OBS Bucket Directly Downloaded When I Access Them?**
- **Why Is the CNAME Resolution Status Unknown?**
- **Why Can Only the Domain Names I Bought on Huawei Cloud Be Automatically Resolved In One Click?**

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7.4 Certificate Hosting

Scenarios

If you want to access a bucket using a user-defined domain name over HTTPS, you need to configure an HTTPS certificate for the domain name. In HTTPS, digital certificates are essential for securing communication, preserving data integrity, and verifying identity.

- Identity authentication uses a certificate to verify that a server is who it claims to be. This in turn helps defend against man-in-the-middle (MITM) attacks and protects users from connecting to a forged phishing website. In certain scenarios (for example, internal enterprise systems), HTTPS mutual authentication can be implemented using digital certificates. In this setup, the client is also required to present a certificate for the server to verify its identity, thereby further enhancing security.
- Data encryption protects the confidentiality of communications by setting up an encrypted channel between the client and the server. This ensures that the transmitted data (such as passwords, credit card information, and chat content) remains secure. Even if the data is intercepted, it cannot be read.
- Data integrity protects data from being tampered with. During HTTPS transmission, a hash function (for example, SHA-256) is used to create a message digest and this digest is then encrypted using a session key. This ensures that data is not tampered with or replaced during transmission.

Functions

OBS supports international certificates. You can configure an HTTPS certificate when you configure a user-defined domain name. For details, see **Configuring a User-Defined Domain Name**. You can also configure an HTTPS certificate after you configure a user-defined domain name. For details, see **Configuring an HTTPS Certificate for a User-Defined Domain Name**.

Constraints

- HTTPS certificate hosting is only available for user-defined domain names.
- Only common certificates are supported. Chinese cryptographic certificates are not supported.
- When HTTPS certificates are required, a maximum of 100 user-defined domain names can be configured for each bucket.

Certificate Format

A certificate consists of two parts: **the certificate file and the private key**.

Certificate File Format

The certificate file must meet the following requirements:

The certificate file must contain information such as the public key and signature. The file name must end with **.pem** or **.crt**.

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- The certificate file is prefixed with **-----BEGIN CERTIFICATE-----** and postfixed with **-----END CERTIFICATE-----**.
- The certificate file cannot contain blank lines. Each line must contain exactly 64 characters, except for the last line, which can contain fewer.

Example:

```
-----BEGIN CERTIFICATE-----
MIIDIjCCAougAwIBAgIJALV96mEtVF4EMA0GCSqGSIb3DQEBBQUAMGoxCzAJBgNV
BAYTAnh4MQswCQYDVQQIEwJ4eDELMAkGA1UEBxMCeHgxCzAJBgNVBAoTAnh4MQsw
CQYDVQQLEwJ4eDELMAkGA1UEAxMCeHgxGjAYBgkqhkiG9w0BCQEWC3h4eEAxNjMu
Y29tMB4XDTE3MTExMzAyMjYxM1oXDTIwMTExMjAyMjYxM1owajELMAkGA1UEBhMC
eHgxCzAJBgNVBAgTAnh4MQswCQYDVQQHEwJ4eDELMAkGA1UEChMCeHgxCzAJBgNV
BAsTAnh4MQswCQYDVQQDEwJ4eDEaMBgGCSqGSIb3DQEJARYLeHh4QDE2My5jb20w
gZ8wDQYJKoZIhvcNAQEBBQADgY0AMIGJAoGBAMU832iM+d3FILgTWmpZBUoYcIWV
cAAYE7FsZ9LNerOyjJpyi256oypdBvGs9JAUBN5WaFk81UQx29wAyNixX+bKa0DB
WpUDqr84V1f9vdQc75v9WoujcnlKszzpV6qePPC7igJJpu4QOI362BrWzJCYQbg4
Uzo1KYBhLFxl0TovAgMBAAGjgc8wgcwwHQYDVR0OBBYEFMbTvDyvE2KsRy9zPq/J
WOjovG+WMIGcBgNVHSMEgZQwgZGAFMbTvDyvE2KsRy9zPq/JWOjovG+WoW6kbDBq
MQswCQYDVQQGEwJ4eDELMAkGA1UECBMCeHgxCzAJBgNVBAcTAnh4MQswCQYDVQQK
EwJ4eDELMAkGA1UECxMCeHgxCzAJBgNVBAMTAnh4MRowGAYJKoZIhvcNAQkBFgt4
eHhAMTYzLmNvbYIJALV96mEtVF4EMAwGA1UdEwQFMAMBAf8wDQYJKoZIhvcNAQEF
BQADgYEAASkC/1iwiALa2RU3YCxqZFEEsZZvQxikrDkDbFeoa6Tk49Fnb1f7FCW6
PTtY3HPWl5ygsMsSy0Fi3xp3jmuIwzJhcQ3tcK5gC99HWp6Kw37RL8WoB8GWFU0Q
4tHLOjBIxkZROPRhH+zMIrqUexv6fsb3NWKhnlfh1Mj5wQE4Ldo=
-----END CERTIFICATE-----
```

Private Key Format

The private key must meet the following requirements:

The private key must have the **.key** extension and must not have a password. The format of the private key is as follows:

- The private key is a PEM encoded file.
  - The private key is prefixed with **-----BEGIN RSA PRIVATE KEY-----** and postfixed with **-----END RSA PRIVATE KEY-----**.
- The private key cannot contain blank lines. Each line must contain exactly 64 characters, except for the last line, which can contain fewer.

Example:

```
-----BEGIN RSA PRIVATE KEY-----
MIICXQIBAAKBgQDFPN9ojPndxSC4E1pqWQVKGHCFlXAAGBOxbGfSzXqzsoyacotu
eqMqXQbxrPSQFATeVmhZPNVEMdvcAMjYsV/mymtAwVqVA6q/OFdX/b3UHO+b/VqL
o3J5SrM86Veqnjzwu4oCSabuEDiN+tga1syQmEG4OFM6NSmAYSxcZdE6LwIDAQAB
AoGBAJvLzJCyIsCJcKHWL6onbSUtDtyFwPViD1QrVAtQYabF14g8CGUZG/9fgheu
TXPtTDcvu7cZdUArvgYW3I9F9IBb2lmF3a44xfiAKdDhzr4DK/vQhvHPuuTeZA41
r2zp8Cu+Bp40pSxmoAOK3B0/peZAka01Ju7c7ZChDWrxleHZAkEA/6dcaWHotfGS
eW5YLbSms3f0m0GH38nRl7oxyCW6yMIDkFHURVMBKW1OhrcuGo8u0nTMi5IH9gRg
5bH8XcujlQJBAMWBQgzCHyoSeryD3TFieXIFzgDBw6Ve5hyMjUtjvgdVKoxRPvpO
kclc39QHP6Dm2wrXXHEej+9RILxBZCVQNbMCQQC42i+Ut0nHvPuXN/UkXzomDHde
h1ySsOAO4H+8Y6OSI87l3HUrByCQ7stX1z3L0HofjHqV9Koy9emGTFLZEzSdAkB7
Ei6cUKKmztkYe3rr+RcATEmwAw3tEJOHmrW5ErApVZKr2TzLMQZ7WZpIPzQRCYnY
2ZZLDuZWFFG3vW+wKKktAkAaQ5GNzbwkRLpXF1FZFuNF7erxypzstbUmU/31b7tS
i5LmxTGKL/xRYtZEHjya4Ikkkgt40q1MrUsgIYbFYMf2
-----END RSA PRIVATE KEY-----
```

Configuring an HTTPS Certificate for a User-Defined Domain Name

You can use **OBS Console** or APIs to configure HTTPS certificates for user-defined domain names.

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Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Domain Name Mgmt**.

Step 4 On the domain name list page, click **Configure** next to **User Domain Name HTTPS Configuration** on the right of the target domain name.

If an HTTPS certificate has been configured, click **Edit** to modify the certificate.

Step 5 Configure HTTPS parameters.

Table 7-12 HTTPS certificate parameters

Parameter	Description
Status	Determines whether to enable HTTPS. • By enabling the **Status** button, you can use a user-defined domain name to access objects stored in OBS over HTTPS, which is more secure. • By default, the **Status** button is disabled, which means HTTPS is not enabled.
Certificate	Choose the SCM certificate you want to use. If you do not have a certificate, click **Buy Certificate** to purchase one on the CCM console. For details, see **Purchasing an SSL Certificate**. **Each certificate has an expiration time. Ensure that the certificate you chose has not expired. Replace the certificate before it expires, or services may be affected.**For details about how to check the certificate validity period, see **How Do I Know When My Certificate Expires?**

Step 6 Click **OK**.

----End

Using APIs

You can use an API to upload a certificate:

Configuring a Custom Domain Name for a Bucket

Obtaining the Custom Domain Name of a Bucket

Follow-up Operations

After you configure an HTTPS certificate for a user-defined domain name, you can access an OBS bucket using https plus the user-defined domain name.

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8 Data Management

8.1 Lifecycle Management

8.1.1 Overview of Lifecycle Management

Scenarios

The last modification time of an object determines when the lifecycle rule applied to the object becomes effective to periodically transition or delete the object. The transition action is to automatically change objects that are no longer frequently accessed to a storage class with a lower cost without copying the objects themselves.

Figure 8-1 OBS object lifecycle management

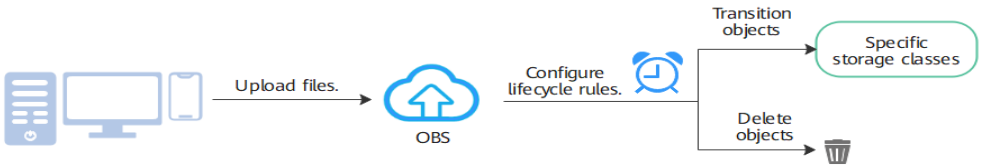

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Table 8-1 Key actions in OBS object lifecycle management

Action	Scenarios	Objects Managed	Operation Guide
Transitions between storage classes	Periodically transition data that is frequently accessed over a period of time but may not be accessed after that period to the Archive or Deep Archive storage class to reduce storage costs. Such data includes digital media, financial and medical records, long-term database backups, and data retained for regulatory compliance.	Objects in a bucket (including the latest and historical versions of objects when versioning is enabled for the bucket)	**Transitioning Objects Using Lifecycle Rules**

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Action	Scenarios	Objects Managed	Operation Guide
Periodical deletion of objects	Periodically delete data, such as log files, that needs to be retained for a period of time and can be deleted after that period.	• Objects in a bucket (including the latest and historical versions of objects when versioning is enabled for the bucket) • Fragments **NOTE** In a multipart upload, a file is divided into multiple parts and then uploaded. After all parts are uploaded, you can make an API call to assemble the parts into a complete object. The parts that failed to be uploaded or assembled are called fragments. You can continue to execute the interrupted or failed multipart upload to remove fragments, or directly delete fragments to reduce storage costs. For more information about fragments, see **Deleting Fragments**. • Expired delete markers **NOTE** An expired delete marker is the only single delete marker that remains after all historical versions of an object are deleted. Removing expired delete markers helps improve performance.	**Deleting Objects Using Lifecycle Rules**

- Descriptions about the elements and syntax of lifecycle rules in **Lifecycle Configuration Elements**
- Lifecycle rule configuration procedure in **Creating a Lifecycle Rule**
- Lifecycle rule examples in **Lifecycle Configuration Examples**

Points in Time for Lifecycle Management

Below describes the key points in time involved in lifecycle management.

Last Modification Time of an Object

- Appending data to an object in a bucket will change the last modification time of the object. Operations, such as changing the object storage class, ACL, metadata, and encryption method, only change the object metadata.

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- For parallel file systems, modifying and truncating a file will change the last modification time of the file.
- Uploading or copying an object in a bucket or a file in a parallel file system will change their last modification time if there is such an object or a file with the same name. If versioning is not enabled, the last modification time of the object or file is the time when the object or file was last uploaded. If versioning is enabled, a newly uploaded object or file becomes the current version, and the original one becomes a historical version. The last modification time of both the current version and the historical version is the time when the object or file was last uploaded.

Start Time of an Object's Lifecycle

After an object is last updated, OBS starts to calculate its lifecycle at the next 00:00 (UTC time). Assume an object was uploaded at 09:00 on June 1, 2024 (UTC). OBS would calculate its lifecycle from 00:00 on June 2, 2024 (UTC). If the object was configured to be deleted one day later, it would be deleted at 00:00 on June 3, 2024 (UTC).

Completion Time of Lifecycle Rule Actions

- It usually takes 24 hours at most for the actions in a lifecycle rule to complete. Considering the start time of the rule, there may be a delay in transitioning storage classes or deleting expired objects, but the total completion time will not exceed 48 hours.

  Assume an object was uploaded at 09:00 on June 1, 2024 (UTC). OBS would calculate its lifecycle from 00:00 on June 2, 2024 (UTC). If the object was configured to be deleted one day later, it would be deleted at 00:00 on June 3, 2024 (UTC). The execution latency does not exceed 24 hours and the deletion would be completed at 00:00 on June 4, 2024 (UTC).
- If you make changes to an existing lifecycle rule, the lifecycle task on the current day will be terminated and the lifecycle execution time may be prolonged. Therefore, do not frequently change a lifecycle rule. For example, if an object was uploaded at 20:20 on June 1, 2024 (UTC) and configured to be deleted one day later, it would be deleted at 00:00 on June 4, 2024 (UTC) at the latest. However, if the lifecycle rule was modified, for example, the rule name was changed, the lifecycle rule would be reloaded and executed again and the deletion may be completed later than 00:00 on June 4, 2024 (UTC).
- Up to 500 million lifecycle-related operations (including deleting objects, changing object storage classes, and deleting fragments) can be performed on a single bucket within 24 hours. If you have higher requirements, **submit a service ticket**.

Billing for Lifecycle Management

If you have configured any lifecycle rules, you will be billed for the actions listed in the tables below.

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Table 8-2 Billing for lifecycle management actions (during action execution)

Action	Billing Item	Description	Billing Mode
Delete after expiration	Requests	You are billed for the number of successfully deleted objects.	Pay-per-Use
	Storage space	If objects are deleted before they have been stored for the required minimum duration (180, 90, and 30 days for Deep Archive, Archive, and Infrequent Access storage, respectively), you still need to pay for the remaining days.	Pay-per-Use Resource packages
Transition from Standard to Infrequent Access	Infrequent Access PUT requests	You are billed for the number of successfully transitioned objects. If *N* objects are successfully transitioned, you are billed for *N* requests.	Pay-per-Use
Transition from Standard to Archive	Archive PUT requests	You are billed for the number of successfully transitioned objects. If *N* objects are successfully transitioned, you are billed for *N* requests.	Pay-per-Use
Transition from Infrequent Access to Archive	Archive PUT requests		
Transition from Standard to Deep Archive	Deep Archive PUT requests	You are billed for the number of successfully transitioned objects. If *N* objects are successfully transitioned, you are billed for *N* requests.	Pay-per-Use
Transition from Infrequent Access to Deep Archive	Deep Archive PUT requests		
Transition from Archive to Deep Archive	Deep Archive PUT requests		

Table 8-3 Billing for lifecycle management actions (after action execution)

Action	Billing Item	Description	Billing Mode
Delete after expiration	N/A	After the deletion is executed, objects have been deleted, so no more billing applies.	N/A

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Action	Billing Item	Description	Billing Mode
Transition from Standard to Infrequent Access	Infrequent Access storage	After the transition, you will be billed for the Infrequent Access storage.	Pay-per-Use
Transition from Standard to Archive	Archive storage	After the transition, you will be billed for the Archive storage.	Pay-per-Use Archive storage resource packages
Transition from Infrequent Access to Archive	Archive storage	1. After the transition, you will be billed for the Archive storage. 2. Infrequent Access has a minimum storage duration of 30 days. If Infrequent Access objects are transitioned to Archive before this minimum duration is reached, you still need to pay for Infrequent Access storage of the remaining days.	
Transition from Standard to Deep Archive	Deep Archive storage	After the transition, you will be billed for the Deep Archive storage.	Pay-per-Use
Transition from Infrequent Access to Deep Archive	Deep Archive storage	1. After the transition, you will be billed for the Deep Archive storage. 2. Infrequent Access has a minimum storage duration of 30 days. If Infrequent Access objects are transitioned to Deep Archive before this minimum duration is reached, you still need to pay for Infrequent Access storage of the remaining days.	
Transition from Archive to Deep Archive	Deep Archive storage	1. After the transition, you will be billed for the Deep Archive storage. 2. Archive has a minimum storage duration of 90 days. If Archive objects are transitioned to Deep Archive before this minimum duration is reached, you still need to pay for Archive storage of the remaining days.	

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8.1.2 Rules for Auto-deleting and Transitioning Objects Through Lifecycle Rules

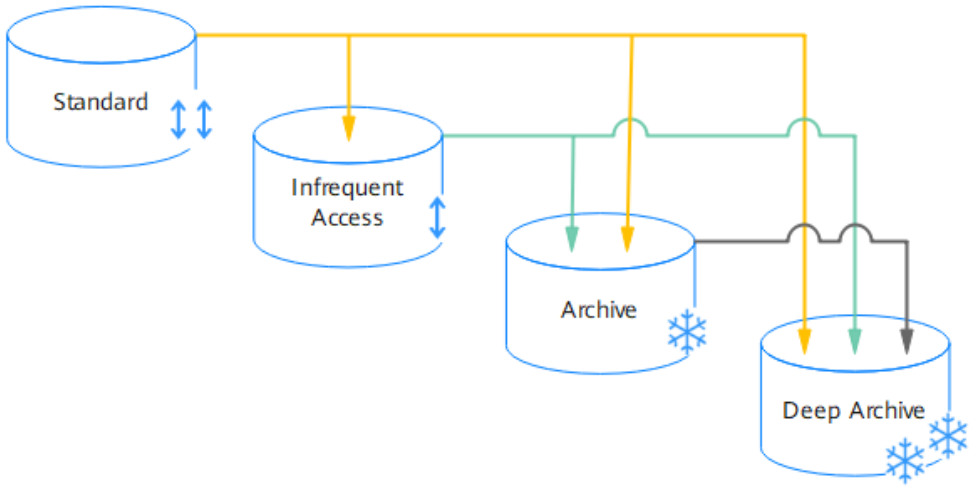
This section describes the rules for auto-deleting and transitioning objects through lifecycle rules.

Constraints

Because multi-AZ redundancy is not supported for Archive and Deep Archive storage, you cannot transition objects in a multi-AZ bucket to Archive or Deep Archive through lifecycle rules.

Transitioning Objects Using Lifecycle Rules

Figure 8-2 Transitioning objects using lifecycle rules



As shown in **Figure 8-2**, OBS allows you to use lifecycle rules to transition objects as follows:

- From Standard to Infrequent Access, Archive, or Deep Archive
- From Infrequent Access to Archive or Deep Archive
- From Archive to Deep Archive

When a lifecycle rule is applied, OBS transitions objects based on the versioning state of your bucket.

Unversioned Bucket

Each object in an unversioned bucket has only one version. You can use lifecycle rules to transition such objects.

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Table 8-4 Transitioning objects in an unversioned bucket

Action Type	Effect of Action	Timer Start Time
Transitioning between storage classes	The object is transitioned to the target storage class.	Time when an object is uploaded

NOTE

If versioning is not enabled for a bucket, there are no noncurrent versions in the bucket. Therefore, the NoncurrentVersionTransition field is invalid.

Versioning-enabled Bucket

You can use lifecycle rules to transition the current and noncurrent versions of objects in a versioning-enabled bucket.

Table 8-5 Transitioning objects in a versioning-enabled bucket

Action Type	Effect of Action	Timer Start Time
Transitioning the current version	• If the current version is not a delete marker version, it is transitioned to the target storage class. • If the current version is a delete marker version, no action is taken.	Time when the current version is uploaded
Transitioning a noncurrent version	• If the noncurrent version is not a delete marker version, it is transitioned to the target storage class. • If the noncurrent version is a delete marker version, no action is taken.	Time when the current version becomes a noncurrent version

Versioning-suspended Bucket

You can use lifecycle rules to transition the current and noncurrent versions of objects in a versioning-suspended bucket.

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Table 8-6 Transitioning the current and noncurrent versions of objects in a versioning-suspended bucket

Action Type	Effect of Action	Timer Start Time
Transitioning the current version	• If the current version is not a delete marker version, it is transitioned to the target storage class. • If the current version is a delete marker version, no action is taken.	Time when the current version is uploaded
Transitioning a noncurrent version	• If the noncurrent version is not a delete marker version, it is transitioned to the target storage class. • If the noncurrent version is a delete marker version, no action is taken.	Time when the current version becomes a noncurrent version

Deleting Objects Using Lifecycle Rules

OBS uses lifecycle rules to delete objects based on the versioning state of your bucket.

Unversioned Bucket

If versioning is not enabled for a bucket, each object has only one version. You can use lifecycle rules to delete objects and fragments from this bucket.

Table 8-7 Deleting objects and fragments from an unversioned bucket

Action Type	Effect of Action
Deleting an object	The object is permanently deleted and cannot be restored.
Deleting fragments	The fragments are permanently deleted and cannot be restored.

NOTE

If versioning is not enabled for a bucket, the bucket does not have noncurrent versions or delete markers. Therefore, the NoncurrentVersionExpiration and ExpiredObjectDeleteMarker fields are invalid.

Versioning-enabled Bucket

You can use lifecycle rules to delete the current version, noncurrent versions, expired delete markers, and fragments of objects from a versioning-enabled bucket.

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Table 8-8 Deleting objects and fragments from a versioning-enabled bucket

Action Type	Effect of Action
Deleting the current version of an object	• If the current version is not a delete marker version, a delete marker with a unique version ID is created. The current version becomes a noncurrent version, and the delete marker version becomes the current version. • If the current version is a delete marker version, no action is taken.
Deleting a noncurrent version of an object	The noncurrent version is deleted and cannot be restored.
Deleting an expired delete marker	The expired delete marker is deleted. After all noncurrent versions of an object are deleted, the current delete marker version will be deleted to improve the List performance.
Deleting fragments	The fragments are permanently deleted and cannot be restored.

Versioning-suspended Bucket

You can use lifecycle rules to delete the current version, noncurrent versions, expired delete markers, and fragments of objects from a versioning-suspended bucket.

Table 8-9 Deleting objects and fragments from a versioning-suspended bucket

Action Type	Effect of Action
Deleting the current version of an object	• If the current version is not a delete marker version and the version ID is not null, the current version becomes a noncurrent version, and the delete marker version with a null ID becomes the current version. **NOTE** After versioning is suspended, a newly uploaded object will have the version ID of null. If the newly uploaded object has the same name as an existing object with a null version ID, this new object will overwrite the existing object. For details, see **Versioning**. • If the current version is not a delete marker version and the current version ID is null, the delete marker version with the null ID overwrites the current version. The delete marker then becomes the current version, and the overwritten version cannot be recovered. • If the current version is a delete marker version, no action is taken.

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Action Type	Effect of Action
Deleting a noncurrent version of an object	The noncurrent version is deleted and cannot be restored.
Deleting an expired delete marker	The expired delete marker of the object is deleted. After all noncurrent versions of an object are deleted, the current delete marker version will be deleted to improve the List performance.
Deleting fragments	The fragments are permanently deleted and cannot be restored.

Overlapping Lifecycle Rules

OBS allows you to configure multiple lifecycle rules for a single bucket. Multiple lifecycle rules may overlap. For example:

- If a rule has no prefix specified, this rule overlaps with any other rules.
- If two rules have the same prefix, they overlap.
- If the prefix of a rule is the substring of another rule's prefix, the rules overlap.

If a rule to be created overlaps with an existing one, the rule must meet the following requirements or it will fail to be created:

- The prefix and the tag cannot be the same as those of the existing rule at the same time.
- The rule uses either **Days** or **Date**.
- The actions on an object take place in the following order: Transition to Infrequent Access > Transition to Archive > Transition to Deep Archive > Delete the object upon expiration.
- The overlapping rules do not contain the same action, for example, deleting objects, transitioning to Infrequent Access, Archive, or Deep Archive storage.
- If there is an overlapping rule, the settings for deleting expired versions, fragments, and expired delete markers cannot be configured at the same time. Otherwise, there will be conflicts. For example:

Lifecycle Rule A / Lifecycle Rule B	Deleting current version upon expiration	Deleting fragments upon expiration	Removing expired delete markers
Deleting current version upon expiration	Conflict	No conflict	No conflict
Deleting fragments upon expiration	No conflict	Conflict	No conflict
Removing expired delete markers	No conflict	No conflict	Conflict

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Precautions

- Encrypted objects remain encrypted when their storage class is transitioned.
- Minimum storage duration

  The minimum storage duration is the minimum billable storage duration. This means that objects will be billed for the minimum storage duration even if they are not stored for that long. For example, if an object is transitioned to Archive after being stored in Infrequent Access for 20 days, it will be billed for the storage of 30 days (the minimum storage duration for Infrequent Access).

Item	Standard	Infrequent Access	Archive	Deep Archive (in OBT)
Minimum storage duration	N/A	30 days	90 days	180 days

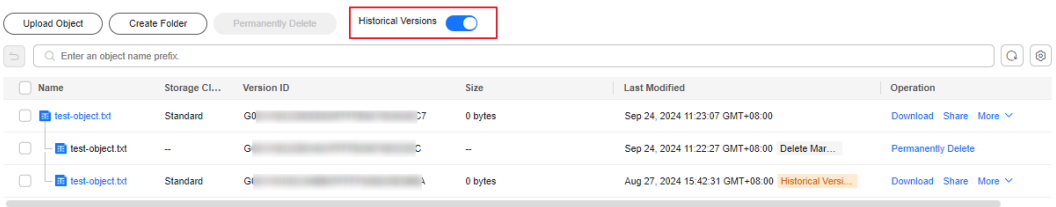
Related Operations

How Do I Check Whether an Object Version Has a Delete Marker?

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list of **OBS Console**, click the desired bucket to go to the **Objects** page.

Step 3 Enable **Historical Version** to check whether the versions of the object have a delete marker.



----End

You can also use the API for **listing objects in a bucket** or the following SDKs to check whether an object version has a delete marker:

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

8.1.3 Creating a Lifecycle Rule

Application Scenarios

This section describes how to create a lifecycle rule.

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Constraints

- A lifecycle rule can use prefixes and **tags** but cannot use wildcards, suffixes, or regular expressions.
- A bucket can have an unlimited number of lifecycle rules, but the XML file of all its rules cannot exceed 20 KB.
- A maximum of 20 lifecycle rules can be configured for a parallel file system.
- If you want to modify the lifecycle rules of a bucket, you need to add rules. For example, if a bucket has already had Rule 1, you can add Rule 2 by performing the following operations:
  a. Call GetBucketLifecycle to obtain Rule 1.
  b. Add Rule 2.
  c. Call PutBucketLifecycle to update the lifecycle rule to Rule 1 and Rule 2.

  NOTE

  If you use **OBS Console** to update an existing lifecycle rule, you do not need to obtain the rule first. You just need to add a new rule. The new rule automatically overwrites the existing one. For details, see **Configuring a Lifecycle Rule on OBS Console**.

Lifecycle Rule Configuration

You can use **OBS Console**, APIs, or SDKs to configure a lifecycle rule.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Data Management** > **Lifecycle Rules**.

Step 4 Click **Create**. The **Create Lifecycle Rule** dialog box is displayed.

Step 5 Configure parameters under **Basic Information**.

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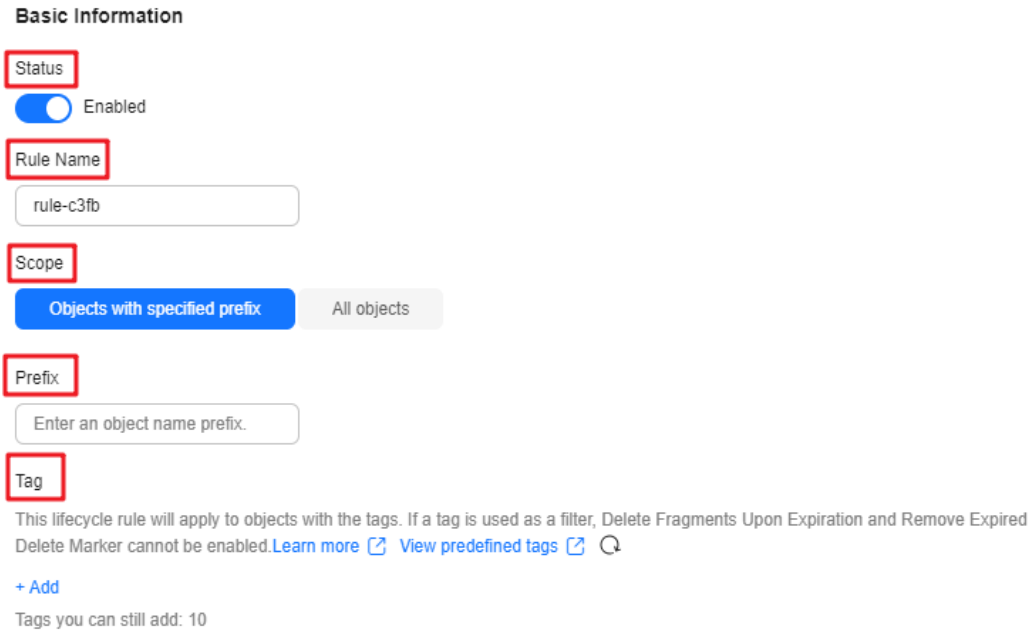

Table 8-10 Parameters under **Basic Information**

Parameter	Description
Status	Whether to enable the lifecycle rule • If **Status** is enabled, the lifecycle rule will be applied to affected objects as scheduled. The actions that can be triggered include storage class transitions, object deletion, fragment deletion, and removal of expired delete markers. • If **Status** is disabled, the lifecycle rule will not be applied.
Rule Name	The name of the lifecycle rule A rule name: • Can be 255 characters long. • Can contain only uppercase letters, lowercase letters, digits, periods (.), underscores (_), and hyphens (-).
Scope	The scope of objects the lifecycle rule applies to • **Objects with specified prefix**: The rule applies to the objects with the specified prefix in the bucket. • **All objects**: The rule applies to all objects in the bucket. Multiple lifecycle rules may overlap. In such cases, the **overlapping must comply with** the **predefined constraints**. Otherwise, **conflicting rules can cause the configuration to fail**.

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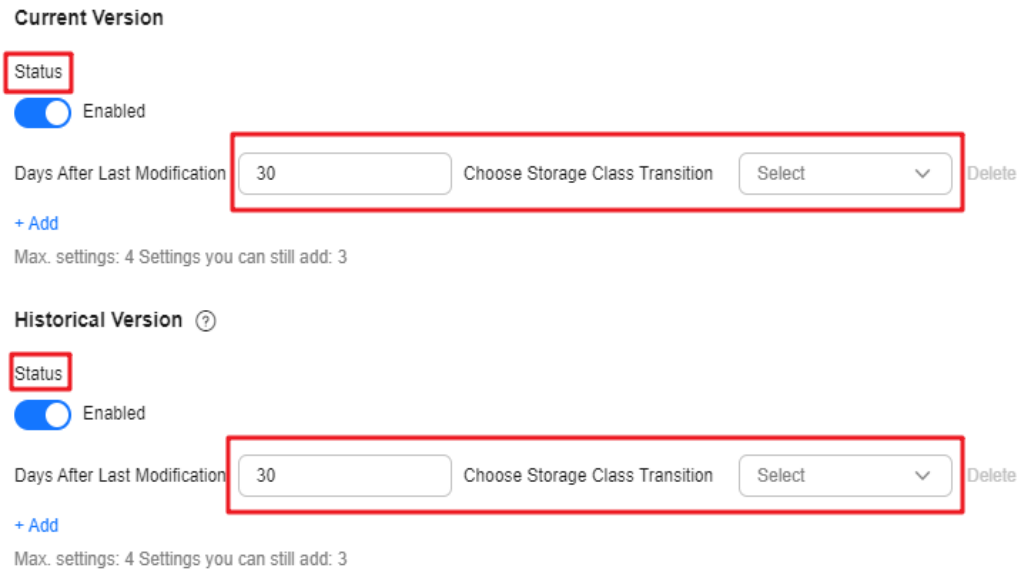
Parameter	Description
Prefix	If you choose **Objects with specified prefix** as the scope, you need to specify an object name prefix. The lifecycle rule applies to the objects with the specified prefix. An object name prefix: • Cannot contain the following special characters: **\ : * ? " < > |** • Cannot start with a slash (/). • Cannot have two consecutive slashes (//).
Tag	Optional You can add a tag to make the lifecycle rule apply to the objects with the specified tag. A lifecycle rule can have a maximum of 10 tags configured. Once a tag is used as a filter, **Delete Fragments Upon Expiration** and **Remove Expired Delete Marker** cannot be enabled. For details about how to add tags to objects, see **Adding Tags to an Object**.

Step 6 Configure **Current Version** and **Historical Version** to specify the number of days after which objects are deleted or transitioned to another storage class.



The **Historical Version** appears only when versioning is enabled or suspended for the bucket.

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Table 8-11 Settings for **Current Version** and **Historical Version**

Item	Description
Status	Whether to enable the current version or historical version. • With **Status** enabled, you can add **a maximum of four settings**. • With **Status** disabled, you do not need to make any settings.
Infrequent Access	After the specified number of days since the last update, objects that meet the defined conditions will be transitioned to Infrequent Access.
Archive	After the specified number of days since the last update, objects that meet the defined conditions will be transitioned to Archive. • If you want to transition objects first to Infrequent Access and then to Archive, make sure that the number of days before transitioning to Archive is greater than the number of days before transitioning to Infrequent Access. • If you only want to transition objects to Archive, there is no such restriction.
Deep Archive	After the specified number of days since the last update, objects that meet the defined conditions will be transitioned to Deep Archive. • If you want to transition objects first to Infrequent Access and then to Deep Archive, make sure that the number of days before transitioning to Deep Archive is greater than the number of days before transitioning to Infrequent Access. • If you want to transition objects first to Archive and then to Deep Archive, make sure that the number of days before transitioning to Deep Archive is greater than the number of days before transitioning to Archive. • If you only want to transition objects to Deep Archive, there is no such restriction.
Delete Upon Expiration	After the specified number of days since the last update, OBS will delete the objects that meet the defined conditions. The number of days before performing this action **must be an integer greater than** that specified for any transition. If **versioning is not enabled for the bucket**, specified objects will be permanently deleted once they expire. **The deleted objects cannot be recovered**.

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Transitioning the storage class of objects or deleting objects may **incur changes in costs**. The details are as follows:

- Deleting objects frees up storage space. Prices vary depending on storage classes.
- Deep Archive, Archive or Infrequent Access objects have a minimum billable storage duration of 180, 90 or 30 days, respectively. If the objects are deleted or transitioned before this minimum duration is reached, you still need to pay for a full storage duration.
- Transitioning storage classes through lifecycle rules will incur request costs.
- For details about lifecycle rule billing, see **Billing in Special Scenarios**.

NOTE

- **Current Version** and **Historical Version** are two concepts related to **Versioning**. If versioning is enabled for a bucket, uploading objects with the same name to the bucket creates different object versions. The last uploaded object is called the current version, while those previously uploaded are called historical versions. For more information, see **Versioning**.
- You must configure either **Current Version** or **Historical Version**. You can also configure both of them.

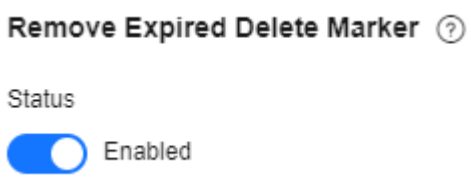
Step 7 Configure **Delete Fragments Upon Expiration** to specify the number of days after which fragments are deleted.

- **Status**: whether to enable **Delete Fragments Upon Expiration**
- You can specify the number of days after which fragments in the bucket will be deleted.

NOTE

Incomplete data in a bucket is called fragments. Fragments are generated during failed upload attempts.

Step 8 Configure **Remove Expired Delete Marker**.



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An expired delete marker is the only single delete marker that remains after all historical versions of an object are deleted. This action will remove expired delete markers to improve performance.

Status: whether to remove expired delete markers

Step 9 Select "I have confirmed these lifecycle rule configurations and understand how they may impact my costs."

Step 10 Click **OK** to complete the lifecycle rule configuration.

----End

Using APIs

Configuring Bucket Lifecycle Rules

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the GUI Tool - OBS Browser+

Step 1 Log in to OBS Browser+.

Step 2 Select the bucket for which you want to configure a lifecycle rule and choose **More** > **Lifecycle Rules**.

Step 3 Click **Create**.

Step 4 Configure related parameters.

Table 8-12 Lifecycle rule parameters

Parameter	Description
Status	Whether to enable the lifecycle rule • If **Status** is enabled, the lifecycle rule will be applied to affected objects as scheduled. The actions that can be triggered include storage class transitions and object deletion. • If **Status** is disabled, the lifecycle rule will not be applied.
Rule Name	The name of the lifecycle rule A rule name: • Can be 255 characters long. • Can contain only uppercase letters, lowercase letters, digits, periods (.), underscores (_), and hyphens (-).

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Parameter	Description
Applies To	The scope of objects the lifecycle rule applies to • **Object name prefix**: The rule applies to the objects with the specified prefix in the bucket. • **Bucket**: The rule applies to all objects in the bucket. Note that the configuration may fail in the following situations: • If the specified prefix overlaps with the prefix of an existing lifecycle rule, OBS regards these two rules as one and forbids you to configure the one you are configuring. For example, if there is a rule with prefix **abc** in the system, you cannot create another rule whose prefix contains **abc**. • If there is already a lifecycle rule based on an object prefix, you are not allowed to configure another rule that is applied to the entire bucket. • If there is a lifecycle rule that can be applied to the entire bucket, you cannot create any rule based on prefix.
Prefix	If you choose **Object name prefix**, you need to specify an object name prefix. The lifecycle rule applies to the objects with the specified prefix. An object name prefix: • Cannot contain the following special characters: **\ : * ? " < > |** • Cannot start with a slash (/). • Cannot have two consecutive slashes (//).
Transition to Infrequent Access	After the specified number of days since the last update, objects that meet the defined conditions will be transitioned to Infrequent Access.
Transition to Archive	After the specified number of days since the last update, objects that meet the defined conditions will be transitioned to Archive. • If you want to transition objects first to Infrequent Access and then to Archive, make sure that the number of days before transitioning to Archive is greater than the number of days before transitioning to Infrequent Access. • If you only want to transition objects to Archive, there is no such restriction.

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Parameter	Description
Expiration Time	After the specified number of days since the last update, OBS will delete the objects that meet the defined conditions. The number of days before performing this action **must be an integer greater than** that specified for any transition. If **versioning is not enabled for the bucket**, specified objects will be permanently deleted once they expire. **The deleted objects cannot be recovered**.

An example is given as follows:

Assume you stored the following files in OBS on January 7, 2022:

- log/test1.log
- log/test2.log
- doc/example.doc
- doc/good.txt

On January 10, 2022, you additionally stored the following files in OBS:

- log/clientlog.log
- log/serverlog.log
- doc/work.doc
- doc/travel.txt

  On January 10, 2022, you configured a lifecycle rule to expire and delete objects with the **log/** prefix one day after their upload. Objects **log/clientlog.log**, **log/serverlog.log**, **log/test1.log**, and **log/test2.log** would be deleted on January 12, 2022.

  If you configure a lifecycle rule to transition objects with the **log** prefix to Infrequent Access and Archive 30 days and 60 days after their upload and to delete the objects 100 days after their upload. OBS performs those actions on **log/clientlog.log**, **log/serverlog.log**, **log/test1.log**, and **log/test2.log** one day after the defined transition periods are reached.

Step 5 Click **OK** to save the lifecycle rule.

----End

Configuring a Lifecycle Rule for a Single Object

You can set the time for deleting an object when uploading it. If versioning is enabled, you can set a deletion time for each object version when uploading it. An object lifecycle rule only affects object versions and not delete markers or fragments.

Unlike setting a lifecycle rule for a bucket, an object lifecycle rule only applies to that specific object. You can only schedule the deletion of the object, and not any

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storage class transitions. If a bucket lifecycle rule conflicts with an object lifecycle rule, the object lifecycle rule will apply.

You can use APIs or SDKs to configure a lifecycle rule for a single object.

Using APIs

Specify the **x-obs-expires** header if you upload an object using **PUT** (simple upload) or **POST** (browser-based upload).

Using SDKs

The following OBS SDKs provides APIs for you to upload objects and configure the **expires** parameter for object deletion upon expiration:

- **Java**
- **Python**
- **C**
- **Go**
- **BrowserJS**
- **.NET**
- **Android**
- **iOS**
- **PHP**
- **Node.js**

8.1.4 Lifecycle Configuration Examples

If you use APIs or SDKs to create a lifecycle rule, refer to the XML example.

Specifying a Rule with a Single Filter Condition

Example 1: Applying a lifecycle rule to all objects in a bucket

To apply the rule to all objects in the bucket, leave the prefix blank. Objects will be transitioned to the Archive storage class 100 days after creation.

XML:

```
<LifecycleConfiguration>
   <Rule>
      <ID>sample-rule</ID>
      <Prefix></Prefix>
      <Status>Enabled</Status>
      <Transition>
         <Days>100</Days>
         <StorageClass>COLD</StorageClass>
      </Transition>
   </Rule>
</LifecycleConfiguration>
```

Example 2: Specifying a filter by object name prefix

The following lifecycle rule specifies prefix **texta/** as the filter. It applies to objects with the **texta/** prefix, such as **texta/file1.txt** and **texta/file2.txt**.

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This rule specifies two actions: transitioning objects to the Infrequent Access storage class 90 days after creation and deleting objects 120 days after creation.

XML:

```
<LifecycleConfiguration>
   <Rule>
      <ID>sample-rule</ID>
      <Status>Enabled</Status>
      <Prefix>texta/</Prefix>
      <Transition>
         <Days>90</Days>
         <StorageClass>WARM</StorageClass>
      </Transition>
      <Expiration>
         <Days>120</Days>
      </Expiration>
   </Rule>
</LifecycleConfiguration>
```

Example 3: Specifying a filter by object name prefix and deleting the specified objects that was last modified before the specified date

The following lifecycle rule specifies prefix **texta/** as the filter. It applies to objects with the **texta/** prefix, such as **texta/file1.txt** and **texta/file2.txt**.

This rule specifies one action: deleting objects that were last modified before May 30, 2024.

XML:

```
<LifecycleConfiguration>
   <Rule>
      <ID>sample-rule</ID>
      <Status>Enabled</Status>
      <Prefix>texta/</Prefix>
      <Expiration>
         <Date>2024-05-30T00:00:00.000Z</Date>
      </Expiration>
   </Rule>
</LifecycleConfiguration>
```

Example 4: Specifying a filter by object name prefix and transitioning the specified objects that was last modified before the specified date

The following lifecycle rule specifies prefix **texta/** as the filter. It applies to objects with the **texta/** prefix, such as **texta/file1.txt** and **texta/file2.txt**.

This rule specifies one action: transitioning objects that were last modified before May 30, 2024 to the Archive storage class.

XML:

```
<LifecycleConfiguration>
   <Rule>
      <ID>sample-rule</ID>
      <Status>Enabled</Status>
      <Prefix>texta/</Prefix>
      <Transition>
         <Date>2024-05-30T00:00:00.000Z</Date>
         <StorageClass>COLD</StorageClass>
      </Transition>
   </Rule>
</LifecycleConfiguration>
```

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Specifying a Rule with Multiple Filter Conditions

To use multiple filters in a single rule, you must wrap the filters in an **And** element.

Example 1: Specifying a rule with multiple filter conditions

- The following rule deletes objects with the **texta/** prefix and with tags **key1/value1** and **key2/value2** 120 days after their creation.

```
<LifecycleConfiguration>
   <Rule>
      <ID>sample-rule</ID>
      <Filter>
         <And>
            <Prefix>texta/</Prefix>
            <Tag>
               <Key>key1</Key>
               <Value>value1</Value>
            </Tag>
            <Tag>
               <Key>key2</Key>
               <Value>value2</Value>
            </Tag>
         </And>
      </Filter>
      <Status>Enabled</Status>
      <Expiration>
         <Days>120</Days>
      </Expiration>
   </Rule>
</LifecycleConfiguration>
```

Specifying Multiple Rules

If you want objects to have different lifecycle actions, you can specify multiple rules. The following lifecycle configuration has two rules:

1. Rule 1 applies to objects with the **texta/** prefix. It directs OBS to transition objects to the Archive storage class 120 days after creation and to delete them 360 days after creation.
2. Rule 2 applies to objects with the **textb/** prefix. It directs OBS to transition objects to the Infrequent Access storage class 90 days after creation and to delete them 120 days after creation.

XML:

```
<LifecycleConfiguration>
   <Rule>
      <ID>sample-rule1</ID>
      <Prefix>texta/</Prefix>
      <Status>Enabled</Status>
      <Transition>
         <Days>120</Days>
         <StorageClass>COLD</StorageClass>
      </Transition>
      <Expiration>
         <Days>360</Days>
      </Expiration>
   </Rule>
   <Rule>
      <ID>sample-rule2</ID>
      <Prefix>textb/</Prefix>
      <Status>Enabled</Status>
      <Transition>
         <Days>90</Days>
```

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```
        <StorageClass>WARM</StorageClass>
      </Transition>
      <Expiration>
        <Days>120</Days>
      </Expiration>
   </Rule>
</LifecycleConfiguration>
```

Specifying Multiple Rules with Overlapping Filter Conditions

NOTE

For details about overlapping prefixes and conflicting actions, see **Overlapping Lifecycle Rules**.

Example 1: Overlapping prefixes (no conflict)

- **Rules**: Rule 1 specifies an empty filter (indicating all objects in the bucket). It lets OBS delete all objects 120 days after creation. Rule 2 specifies the **typea/** prefix (indicating objects with the **typea/** prefix). It lets OBS transition objects to the Archive storage class 90 days after creation.
- **Result**: There are no conflicting lifecycle actions. Objects with the **typea/** prefix are transitioned to the Archive storage class 90 days after creation and then deleted 120 days after creation.

```
<LifecycleConfiguration>
   <Rule>
      <ID>sample-rule1</ID>
      <Prefix></Prefix>
      <Status>Enabled</Status>
      <Expiration>
         <Days>120</Days>
      </Expiration>
   </Rule>
   <Rule>
      <ID>sample-rule2</ID>
      <Prefix>typea/</Prefix>
      <Status>Enabled</Status>
      <Transition>
         <Days>90</Days>
         <StorageClass>COLD</StorageClass>
      </Transition>
   </Rule>
</LifecycleConfiguration>
```

Example 2: Conflicting prefixes and tags (no conflict)

- **Rules**: Rule 1 specifies the **ab** prefix and a tag (**key1/value1**). It lets OBS delete objects 120 days after creation. Rule 2 specifies the **abc** prefix and two tags (**key1/value1** and **key2/value2**). It lets OBS transition objects to the Archive storage class 90 days after creation.
- **Result**: There are no conflicting lifecycle actions. Objects with the **abc** prefix and with tags **key1/value1** and **key2/value2** are transitioned to the Archive storage class 90 days after creation and then deleted 120 days after creation.

```
<LifecycleConfiguration>
   <Rule>
      <ID>sample-rule1</ID>
      <Filter>
         <And>
            <Prefix>ab</Prefix>
            <Tag>
               <Key>key1</Key>
               <Value>value1</Value>
            </Tag>
```

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```
        </And>
      </Filter>
      <Status>Enabled</Status>
      <Expiration>
         <Days>120</Days>
      </Expiration>
   </Rule>
   <Rule>
      <ID>sample-rule2</ID>
      <Filter>
         <And>
            <Prefix>abc</Prefix>
            <Tag>
               <Key>key1</Key>
               <Value>value1</Value>
            </Tag>
            <Tag>
               <Key>key2</Key>
               <Value>value2</Value>
            </Tag>
         </And>
      </Filter>
      <Status>Enabled</Status>
      <Transition>
         <Days>90</Days>
         <StorageClass>COLD</StorageClass>
      </Transition>
   </Rule>
</LifecycleConfiguration>
```

Example 3: Overlapping prefixes resulting in conflicting lifecycle actions

- **Rules**: Rule 1 specifies an empty filter (indicating all objects in the bucket). It lets OBS delete all objects 90 days after creation. Rule 2 specifies the **typea/** prefix (indicating objects with the **typea/** prefix). It lets OBS transition objects to the Archive storage class 120 days after creation.
- **Result**: The lifecycle actions conflict. Such configuration is not allowed.
-

```
<LifecycleConfiguration>
   <Rule>
      <ID>sample-rule1</ID>
      <Prefix></Prefix>
      <Status>Enabled</Status>
      <Expiration>
         <Days>90</Days>
      </Expiration>
   </Rule>
   <Rule>
      <ID>sample-rule2</ID>
      <Prefix>typea/</Prefix>
      <Status>Enabled</Status>
      <Transition>
         <Days>120</Days>
         <StorageClass>COLD</StorageClass>
      </Transition>
   </Rule>
</LifecycleConfiguration>
```

Example 4: Overlapping prefixes and tags resulting in conflicting lifecycle actions

- **Rules**: Rule 1 specifies the **abc** prefix and a tag (**key1/value1**). It lets OBS delete objects 90 days after creation. Rule 2 specifies the **ab** prefix and two tags (**key1/value1** and **key2/value2**). It lets OBS transition objects to the Archive storage class 120 days after creation.

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- **Result**: The lifecycle actions conflict. Such configuration is not allowed.
- ```
  <LifecycleConfiguration>
    <Rule>
      <ID>sample-rule1</ID>
      <Filter>
        <And>
          <Prefix>abc</Prefix>
          <Tag>
            <Key>key1</Key>
            <Value>value1</Value>
          </Tag>
        </And>
      </Filter>
      <Status>Enabled</Status>
      <Expiration>
        <Days>90</Days>
      </Expiration>
    </Rule>
    <Rule>
      <ID>sample-rule2</ID>
      <Filter>
        <And>
          <Prefix>ab</Prefix>
          <Tag>
            <Key>key1</Key>
            <Value>value1</Value>
          </Tag>
          <Tag>
            <Key>key2</Key>
            <Value>value2</Value>
          </Tag>
        </And>
      </Filter>
      <Status>Enabled</Status>
      <Transition>
        <Days>120</Days>
        <StorageClass>COLD</StorageClass>
      </Transition>
    </Rule>
  </LifecycleConfiguration>
  ```

Deleting Fragments

The following lifecycle rule specifies prefix **texta/** as the filter. It applies to objects with the **texta/** prefix, such as **texta/file1.txt** and **texta/file2.txt**. This rule lets OBS delete object fragments 10 days after generation.

```
</LifecycleConfiguration>
  <Rule>
    <ID>sample-rule</ID>
    <Prefix>texta/</Prefix>
    <Status>Enabled</Status>
    <AbortIncompleteMultipartUpload>
      <DaysAfterInitiation>10</DaysAfterInitiation>
    </AbortIncompleteMultipartUpload>
  </Rule>
</LifecycleConfiguration>
```

Specifying a Lifecycle Rule for a Versioning-Enabled/Suspended Bucket

Example 1: Periodically transitioning and deleting historical object versions

The following lifecycle rule specifies prefix **prefix1/** as the filter. It applies to objects with the **prefix1/** prefix, such as **prefix1/file1.txt** and **prefix1/file2.txt**.

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```

This rule specifies two lifecycle actions: transitioning historical object versions to the Archive storage class 20 days after generation and deleting them 30 days after generation.

```
<LifecycleConfiguration>
    <Rule>
        <ID>sample-rule</ID>
        <Prefix>prefix1/</Prefix>
        <Status>Enabled</Status>
        <NoncurrentVersionTransition>
            <NoncurrentDays>20</NoncurrentDays>
            <StorageClass>COLD</StorageClass>
        </NoncurrentVersionTransition>
        <NoncurrentVersionExpiration>
            <NoncurrentDays>30</NoncurrentDays>
        </NoncurrentVersionExpiration>
    </Rule>
 </LifecycleConfiguration>
```

Example 2: Removing expired delete markers

The following lifecycle rule specifies prefix **prefix1/** as the filter. It applies to objects with the **prefix1/** prefix, such as **prefix1/file1.txt** and **prefix1/file2.txt**.

If all versions of an object with the **prefix1/** prefix have been deleted and only one expired delete marker remains, this rule lets OBS remove this expired delete marker.

```
</LifecycleConfiguration>
  <Rule>
      <ID>sample-rule</ID>
      <Prefix>prefix1/</Prefix>
      <Status>Enabled</Status>
      <Expiration>
          <ExpiredObjectDeleteMarker>true</ExpiredObjectDeleteMarker>
      </Expiration>
  </Rule>
</LifecycleConfiguration>
```

Disabling a Lifecycle Rule

The following configuration disables a lifecycle rule. This rule applies to objects with the **texta/** prefix and transitions objects to the Archive storage class 100 days after creation.

XML:

```
<LifecycleConfiguration>
  <Rule>
      <ID>sample-rule</ID>
      <Status>Disabled</Status>
      <Prefix>texta/</Prefix>
      <Transition>
          <Days>100</Days>
          <StorageClass>COLD</StorageClass>
      </Transition>
  </Rule>
</LifecycleConfiguration>
```

8.1.5 Lifecycle Configuration Elements

The following uses an example to describe the elements of a lifecycle rule.

```
<LifecycleConfiguration>
    <!-- First rule -->
```

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```
    <Rule>
        <ID>Rule-1</ID>
        <Prefix>prefix1</Prefix>
        <Status>Enabled</Status>
        <!-- Delete the current version of an object whose last modification time was before May 20, 2023 and prefix is prefix1/. -->
        <Expiration>
            <Date>2023-05-20T00:00:00.000Z</Date>
        </Expiration>
    </Rule>
    <!-- Second rule -->
    <Rule>
        <ID>Rule-2</ID>
        <Filter>
            <Prefix>prefix2</Prefix>
            <Tag>
                <Key>key1</Key>
                <Value>value1</Value>
            </Tag>
        </Filter>
        <Status>Enabled</Status>
        <!-- Transition the current version of an object whose prefix is prefix2/, tag is key1/value1, and last modification time is 30 days ago, to the Archive storage class. -->
        <Transition>
            <Days>30</Days>
            <StorageClass>COLD</StorageClass>
        </Transition>
        <!-- Delete the current version of an object whose prefix is prefix2/, tag is key1/value1, and last modification time is 60 days ago. -->
        <Expiration>
            <Days>60</Days>
        </Expiration>
        <!-- Transition the historical version of an object whose prefix is prefix2/, tag is key1/value1, and last modification time is 30 days ago, to the Archive storage class. -->
        <NoncurrentVersionTransition>
            <NoncurrentDays>30</NoncurrentDays>
            <StorageClass>COLD</StorageClass>
        </NoncurrentVersionTransition>
        <!-- Delete the historical version of an object whose prefix is prefix2/, tag is key1/value1, and last modification time is 60 days ago. -->
        <NoncurrentVersionExpiration>
            <NoncurrentDays>60</NoncurrentDays>
        </NoncurrentVersionExpiration>
    </Rule>
 </LifecycleConfiguration>
```

Elements of a lifecycle rule

A complete lifecycle rule consists of a range of elements that fall into metadata, filters, and actions (execution time included).

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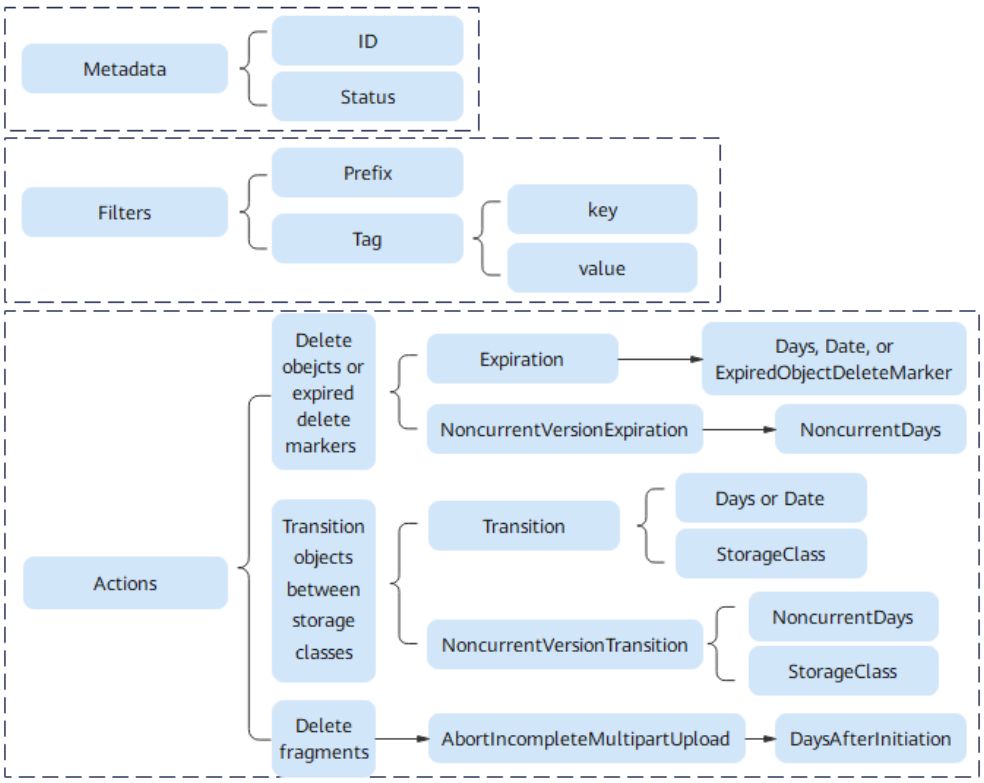
Figure 8-3 Elements of a lifecycle rule



Metadata

Rule metadata describes the rule ID and rule status.

Table 8-13 Metadata elements

Element		Description
Metadata	ID	**Definition**: Rule ID, which uniquely identifies a rule. **Value range**: The value is a string ranging from 0 (exclusive) to 255 characters. It can contain only uppercase or lowercase letters, digits, periods (.), underscores (_), and hyphens (-). **Default value**: If the **ID** element is not used or is left blank, OBS automatically assigns a unique ID to the rule.

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Element		Description
	Status	**Definition**: It indicates whether the rule is enabled or disabled. If the rule is disabled, OBS does not perform any actions defined in the rule. **Value range**: • **Enabled**: The rule is enabled. • **Disabled**: The rule is disabled. **Default value**: N/A

Filters

The object filter criteria of a rule describe the objects to which a lifecycle rule is applied.

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Table 8-14 Filter elements

Element		Description

Filters	Prefix	**Definition**:
		Object name prefix, which identifies the objects to which the lifecycle rule applies
		If you leave the **Prefix** element blank, the rule applies to all objects in the bucket.
		Constraints:
		● Each lifecycle rule must have only one prefix. If no prefix is required for filtering, use **<Prefix></Prefix>** to leave the **Prefix** element blank.
		● If you specify only the **Prefix** element and no **Tag** element, the parent node **Filter** is not required. In the example below, only the **texta/** prefix is specified and no **Tag** elements are specified, so the **Filter** element is not required.
		`<LifecycleConfiguration>`
		`<Rule>`
		`<ID>sample-rule</ID>`
		`<Prefix>texta/</Prefix>`
		`<Status>Enabled</Status>`
		`<Transition>`
		`<Days>100</Days>`
		`<StorageClass>COLD</StorageClass>`
		`</Transition>`
		`</Rule>`
		`</LifecycleConfiguration>`
		Value range:
		The value is a string ranging from 0 to 1024 characters.
		Default value:
		If this element is not specified, it is left blank by default.

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Element		Description
	Tag	**Definition**: Object tag, which identifies the objects to which the lifecycle rule applies. **Constraints**: • Object tags cannot be used as filters for deleting fragments or deleting expired delete markers. • A lifecycle rule allows for zero or up to 10 object tags. • If there are multiple tags specified in a rule, each tag key must be unique. • A tag key: 1. Can be 128 characters long at most. It consists of letters, digits, and spaces representable in UTF-8, and the following special characters: _ . : = + - @. 2. Must be case sensitive. If there are multiple tags, each tag key must be unique. 3. Cannot be left blank. • A tag value: 1. Can be 255 characters long at most. It consists of letters, digits, and spaces representable in UTF-8, and the following special characters: _ . : / = + - @. 2. Must be case sensitive. 3. Can be left blank. In the example below, objects with the **key1/value1** tag will be deleted 120 days after the last update. <LifecycleConfiguration> <Rule> <ID>sample-rule</ID> <Status>Enabled</Status> <Filter> <Tag> <Key>key1</Key> <Value>value1</Value> </Tag> </Filter> <Expiration> <Days>120</Days> </Expiration> </Rule> </LifecycleConfiguration> **Default value**: If this element is not specified, it is left blank by default.

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Element		Description
	Combination of **Prefix** and **Tag**	You can filter objects by a combination of prefix and object tags. In this case, you need to use a logical **And** to combine the filters. A logical **And** must contain at least two filter conditions. **Prefix** is mandatory and only one prefix can be configured. **Tag** is optional and up to 10 tags can be configured. In the example below, objects with the **key1/value1** tag and the **texta/** prefix will be deleted 120 days after the last modification. <LifecycleConfiguration> <Rule> <ID>sample-rule</ID> <Status>Enabled</Status> <Filter> <And> <Prefix>texta/</Prefix> <Tag> <Key>key1</Key> <Value>value1</Value> </Tag> </And> </Filter> <Expiration> <Days>120</Days> </Expiration> </Rule> </LifecycleConfiguration>

Actions

The following table describes actions that will be performed on objects and when the actions will be performed.

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Table 8-15 Elements to describe lifecycle actions

Element	Description	Sub-elements	Description
Expiration	Used to delete objects **NOTE** The **Expiration** action does not delete unassembled multipart uploads.	Days (Use only one of the **Days**, **Date**, and **ExpiredObjectDeleteMarker** elements.)	**Definition**: The number of days since the last object update, after which eligible objects will be expired and then deleted **Constraints**: ● **Days** applies only to the current version of an object. ● For the same object, the time specified for **Expiration** must be later than that for **Transition**. **Value range**: A positive integer, in days **Default value**: N/A
		Date (Use only one of the **Days**, **Date**, and **ExpiredObjectDeleteMarker** elements.)	**Definition**: The date, before which objects were last modified will be expired and then deleted **Constraints**: ● **Date** applies only to the current version of an object. ● The date must be compliant with ISO 8601 and its time must be 00:00:00 in UTC. If **Date** is set to **2018-01-01T00:00:00.000Z**, objects whose last modification time is earlier than **2018-01-01T00:00:00.000Z** will be deleted. ● For the same object, the time specified for **Expiration** must be later than that for **Transition**. ● OBS Console and OBS Browser+ do not support the deletion of objects on a specified date. **Default value**: N/A

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Element	Description	Sub-elements	Description
	Used to remove expired delete markers	ExpiredObjectDeleteMarker (Use only one of the **Days**, **Date**, and **ExpiredObjectDeleteMarker** elements.)	**Definition**: Whether to remove expired delete markers **Constraints**: Object tags cannot be used as filters. **Value range**: • **true**: Expired delete markers are removed. • **false**: Expired delete markers are not removed. **Default value**: N/A
Transition	Used to transition objects between storage classes	Days (Use either **Days** or **Date**.)	**Definition**: The number of days since the last object update, after which eligible objects will be transitioned to another storage class **Constraints**: **Days** applies only to the current version of an object. **Value range**: Unit: day • If only one transition is configured, the time should be at least one day after the update. • If multiple transitions are configured, the transition to the Deep Archive storage class must be later than the transition to Archive, and the transition to Archive must be later than the transition to Infrequent Access. **Default value**: N/A

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Element	Description	Sub-elements	Description
		Date (Use either **Days** or **Date**.)	**Definition**: The date, before which objects were last modified will be transitioned to another storage class **Constraints**: ● **Date** applies only to the current version of an object. ● The date must be compliant with ISO 8601 and its time must be 00:00:00 in UTC. If **Date** is set to **2018-01-01T00:00:00.000Z**, objects whose last modification time is earlier than **2018-01-01T00:00:00.000Z** will be transitioned to another storage class. ● If multiple transitions are configured, the transition to the Deep Archive storage class must be later than the transition to Archive, and the transition to Archive must be later than the transition to Infrequent Access. ● OBS Console and OBS Browser+ do not support the transition of objects on a specified date. **Default value**: N/A
		StorageClass	**Definition**: New storage class eligible objects will be transitioned to **Value range**: ● WARM: the Infrequent Access storage class ● COLD: the Archive storage class ● **DEEP_ARCHIVE**: the Deep Archive storage class **Default value**: N/A

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Element	Description	Sub-elements	Description
AbortIncompleteMultipartUpload	Used to delete fragments	DaysAfterInitiation	**Definition**: The number of days since fragment generation, after which fragments will be expired and then deleted **Constraints**: Object tags cannot be used as filters. **Value range**: A positive integer, in days **Default value**: N/A
NoncurrentVersionExpiration	Used to delete historical object versions	NoncurrentDays	**Definition**: The number of days since the objects became noncurrent, after which noncurrent object versions will be deleted **Constraints**: • **NoncurrentDays** only applies to historical object versions. • **NoncurrentDays** can only be used for buckets that have versioning enabled or suspended. • For the same historical version of an object, the time specified for **Expiration** must be later than that for **Transition**. **Value range**: A positive integer, in days **Default value**: N/A

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Element	Description	Sub-elements	Description
NoncurrentVersionTransition	Used to transition noncurrent versions	NoncurrentDays	**Definition**: The number of days since the objects became noncurrent, after which noncurrent object versions will be transitioned to another storage class **Constraints**: • **NoncurrentDays** only applies to historical object versions. • **NoncurrentDays** can only be used for buckets that have versioning enabled or suspended. **Value range**: Unit: day • If only one transition is involved, the time should be at least one day after the update. • If multiple transitions are involved, the latter transition should be at least one day later than the former transition. • If multiple transitions are configured, the transition to the Deep Archive storage class must be later than the transition to Archive, and the transition to Archive must be later than the transition to Infrequent Access. **Default value**: N/A
		StorageClass	**Definition**: New storage class eligible historical object versions will be transitioned to **Value range**: • WARM: the Infrequent Access storage class • COLD: the Archive storage class • **DEEP_ARCHIVE**: the Deep Archive storage class **Default value**: N/A

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NOTICE

In the same lifecycle rule, **Days** or **Date** must be consistently used. If you use **Days** for **Expiration**, you must also use **Days** (rather than **Date**) for **Transition**, and vice versa.

8.2 Bucket Inventories

Scenarios

A bucket inventory can list objects in a bucket, save object information in CSV files, and deliver the CSV files to the bucket specified for storing bucket inventory files. In this manner, you can easily manage objects in a bucket. A source bucket can also be the destination bucket.

- A bucket inventory file can contain the following object related information: versions, sizes, storage classes, tags, encryption statuses, and last modification time.
- You can encrypt bucket inventory files in SSE-KMS mode.
- You can set the frequency (daily or weekly) for generating bucket inventory files.
- You can also specify a bucket to store the generated bucket inventory files.

Constraints

Bucket versions

- Inventories can be generated only for OBS 3.0 buckets, but they can be stored in either OBS 3.0 or OBS 2.0 buckets.

Maximum number of bucket inventories

- A bucket can have a maximum of 10 inventories.

Source and destination buckets

- The source bucket (for which a bucket inventory rule is configured) and the destination bucket (where the generated inventory files are stored) must belong to the same account.
- The source and destination buckets must be in the same region.
- The destination bucket cannot have server-side encryption enabled.

Functions

- Inventory files must be in the CSV format.
- Inventories can apply to all objects in a bucket or a set of objects with the same name prefix.
- Inventory rules in the same bucket cannot overlap.
  - If there is already an inventory rule for all objects in the bucket, any other inventory rule with an object name prefix specified cannot be created. To create a rule for only a set of objects, first delete the inventory rule configured for all objects.

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  - If there is an inventory rule for a set of objects, a rule for all objects in the bucket cannot be created. To create a rule for all objects, first delete all inventory rules that match objects by prefix.
  - If a bucket already has an inventory rule that filters objects by the object name prefix **ab**, the filter of a new inventory rule cannot start with **a** or **abc**. To create such a rule, you need to first delete the existing inventory rule that conflicts with the rule you will create.
- Only SSE-KMS can be used to encrypt bucket inventories.

Permissions

- Inventory files are uploaded to the destination bucket by an OBS system user, so you must grant this user the write permission for the bucket. That is, the destination bucket must contain a policy with the value of **{"Service": "obs"}** for **Principal**. For details, see 1.

Others

- Bucket inventories are free, but the storage they occupy is billed.
- The bucket inventory function is not available for federated users.

Configuring a Bucket Inventory

Before the configuration, you need to understand what are source and destination buckets.

- Source bucket: A source bucket is the bucket for which an inventory is configured. The inventory lists objects stored in the source bucket.
- Destination bucket: A destination bucket is where generated inventory files are stored. A source bucket can also be the destination bucket. You can specify a name prefix for an inventory. Then generated inventory files will be named with the prefix and saved in the directory with the prefix. If you do not specify any name prefix for the inventory, the generated inventory files are stored in the root directory of the bucket.
  - Restrictions on the destination bucket
    - The destination bucket must belong to the same account as the source bucket.
    - The destination bucket must be in the same region as the source bucket.
    - A bucket policy must be configured to grant OBS the permission to write objects to the destination bucket. For details, see **Add a bucket policy for the destination bucket**.
  - The destination bucket contains the following files:
    - A list of inventory files
    - The **Manifest** file that contains the list of all inventory files under a certain inventory configuration. For details about the **Manifest** file, see **Manifest File**.

Procedure

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You can use **OBS Console** or make a REST API call to configure a bucket inventory. If you use the OBS Console, a bucket policy is automatically generated for the destination bucket. If you call the REST API, you need to manually configure the bucket policy for the destination bucket.

1. Add a bucket policy for the destination bucket.

   A bucket policy must be configured for the destination bucket, to grant the OBS system users the permission to write objects to the destination bucket. The following lists an example bucket policy. Replace **destbucket** with the actual name of the destination bucket.

   ```
   {
      "Statement": [
         {
            "Effect": "Allow",
            "Sid": "1",
            "Principal": {"Service": "obs"},
                     "Resource": ["destbucket/*"],
            "Action": ["PutObject"]
         }
      ]
   }
   ```

2. Configure a bucket inventory.

   There are multiple tools to configure a bucket inventory. For details, see **Bucket Inventories**.

Content in an Inventory File

You can configure the content in an inventory file when creating the inventory. For details about all possible fields, see **Table 8-16**.

Table 8-16 Object metadata listed in an inventory file

Metadata	Description
Bucket	The name of the source bucket
Key	The name of an object. Each object in a bucket has a unique key. (Object names in the inventory file are URL-encoded using UTF-8 character set and can be used only after being decoded.)
VersionId	The version ID of an object. If the value of **IncludedObjectVersions** in the inventory configuration is **Current**, this field is not included in the inventory file.
IsLatest	Whether the object version is the latest. If it is, the value of this field is **True**. This field is not included in the inventory file if **IncludedObjectVersions** in the inventory configuration is set to **Current**.
IsDeleteMarker	Whether versioning is enabled for the source bucket. If it is, deleting an object will create a new piece of object metadata and set **IsDeleteMarker** of the metadata to **true**. This field is not included in the inventory file if **IncludedObjectVersions** in the inventory configuration is set to **Current**.

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Metadata	Description
Size	The object size, in bytes
LastModifiedDate	When an object was created or last modified.
ETag	Hexadecimal digest of the object MD5. ETag is the unique identifier of the object content. It can be used to identify whether the object content is changed. For example, if the ETag value is **A** when an object is uploaded but changes to **B** when the object is downloaded, it means that the object content has been changed.
StorageClass	The storage class of an object ● **STANDARD**: the Standard storage class ● **STANDARD_IA** (also **WARM**): the Infrequent Access storage class ● **COLD**: the Archive storage class ● **DEEP_ARCHIVE**: the Deep Archive storage class
IsMultipartUploaded	Whether an object is uploaded in the multipart mode.
ReplicationStatus	The cross-region replication status of an object
EncryptionStatus	The encryption status of an object

Inventory File Name

The name of an inventory file is in the following format:

```
destinationPrefix/sourceBucketName/inventoryId/yyyy-MM-dd'T'HH-mm'Z'/files/UUID_index.csv
```

- *destinationPrefix* indicates the prefix specified in the inventory configuration, which can be used to group inventory files. If no prefix is specified, the default prefix is **BucketInventory**.
- *sourceBucketName* indicates the source bucket for which the inventory is configured. This field can prevent conflicts when inventory files of different source buckets are saved to the same destination bucket.
- *inventoryId* can prevent conflicts when multiple inventory files of the same source bucket are sent to the same destination bucket.
- *yyyy-MM-dd'T'HH-mm'Z'* indicates the start time and date when the inventory generation begins scanning the bucket. Objects uploaded to the source bucket after this time may not be listed in the inventory file.
- **UUID_index.csv** indicates one of the inventory files.

Manifest File

If there are a large number of objects in a bucket, multiple inventory files may be generated for a single inventory configuration. It takes some time to generate these files. For example, if there are 200,000 objects in a bucket, it will take about 1.5 minutes to generate all inventory files. One or two hours after all inventory

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files are generated, a **manifest.json** file will be generated. The **manifest.json** file contains information about all inventory files generated this time, including:

- **sourceBucket**: name of the source bucket
- **destinationBucket**: name of the destination bucket
- **version**: version of the inventory
- **fileFormat**: format of inventory files
- **fileSchema**: object metadata fields contained in the inventory files
- **files**: list of all inventory files
- **key**: inventory file name
- **size**: size of an inventory file, in bytes
- **inventoriedRecord**: number of records contained in an inventory file

The following is an example of a simple **manifest.json** file.

```
{
	"sourceBucket":"user001",
	"destinationBucket":"bucket001",
	"version":"2019-01-03",
	"fileFormat":"CSV",

"fileSchema":"Bucket,Key,Size,LastModifiedDate,ETag,StorageClass,IsMultipartUploaded,ReplicationStatus,EncryptionStatus",
	"files":[
		{
			"key":"inventory/user001/test_id/2019-01-03T12-28Z/files/0000016813AF58E66806C1E2D7F15155_1.csv",
			"size":6705647390,
			"inventoriedRecord":70585762,
		}
	]
}
```

The name of a **manifest** file is as follows (for details about each field, see **Inventory File Name**):

```
destinationPrefix/sourceBucketName/inventoryId/yyyy-MM-dd'T'HH-mm'Z'/manifest.json
```

symlink.txt File

The **symlink.txt** file records the path of an inventory file. It helps quickly find all inventory files in big data scenarios. Apache Hive is compatible with the **symlink.txt** file. Hive can automatically find the **symlink.txt** file and the inventory files recorded in it.

The name of the **symlink.txt** file is as follows (for details about each field, see **Inventory File Name**):

```
destinationPrefix/sourceBucketName/inventoryId/hive/dt=YYYY-MM-DD-00-00/symlink.txt
```

Ways to Configure a Bucket Inventory

You can use **OBS Console**, APIs, or SDKs to configure a bucket inventory.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

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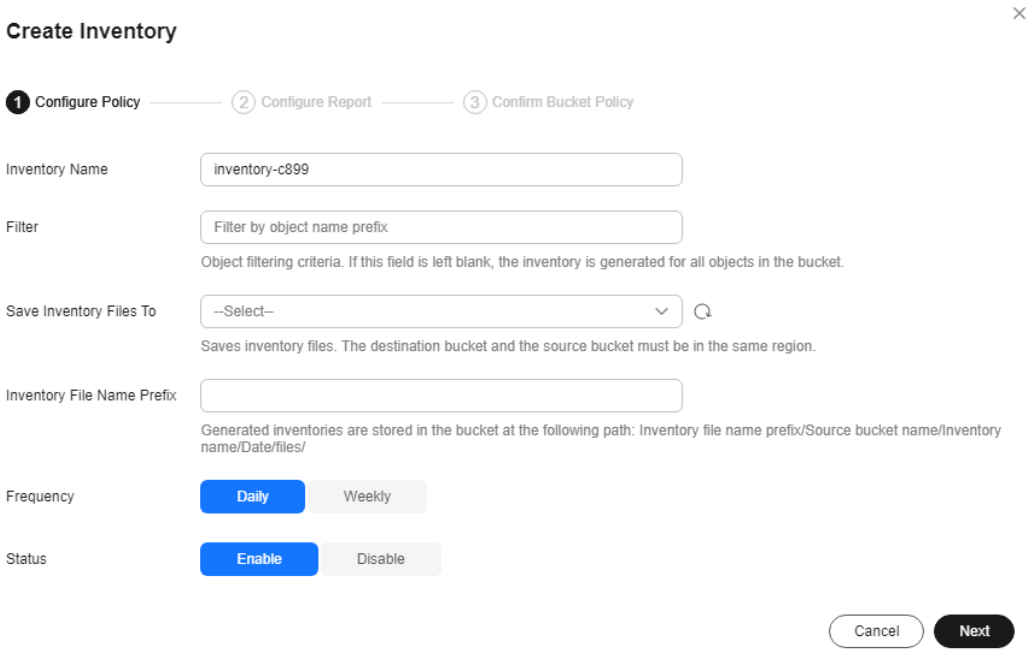
Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Data Management** > **Inventories**. The inventory list is displayed.

Step 4 Click **Create**. The **Create Inventory** dialog box is displayed.

Figure 8-4 Inventory settings



Step 5 Configure required parameters.

Table 8-17 Parameters for configuring a bucket inventory

Parameter	Description
Inventory Name	Name of a bucket inventory
Filter	Filter of an inventory. You can enter an object name prefix for OBS to create an inventory for objects with the specified prefix. Currently, only a prefix can be used as a filter. If the filter is not specified, the inventory covers all objects in the bucket. If a bucket has multiple inventories, their filters cannot overlap with each other.
Save Inventory Files To	Select a bucket (destination bucket) for saving generated inventory files. This bucket must be in the same region as the source bucket.

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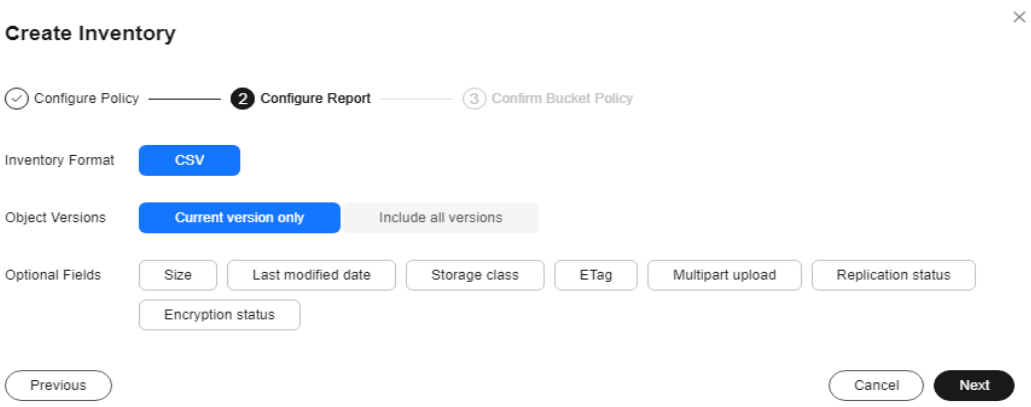
Parameter	Description
Inventory File Name Prefix	Prefix of the inventory file path. An inventory file will be saved in the following path: *Inventory file name prefix/Source bucket name/Inventory name/Date and time/files/*. If this parameter is not specified, OBS automatically adds **BucketInventory** as the prefix to inventory file's path.
Frequency	How frequently inventory files are generated. It can be set to **Daily** or **Weekly**.
Status	Inventory status. You can enable or disable the generation of inventories.

Step 6 Click **Next** to go to the **Configure Report** page.

Figure 8-5 Configuring the report



Step 7 Configure the report.

Table 8-18 Report related parameters

Parameter	Description
Inventory Format	Inventory files can only be saved in CSV format.
Object Versions	Object versions that you want to list in an inventory file. It can be set to **Current version only** or **Include all versions**.
Optional Fields	Object information fields that can be contained in an inventory file, including **Size**, **Last modified date**, **Storage class**, **ETag**, **Multipart upload**, **Encryption status**, and **Replication status**. For details about the fields, see **Metadata in an Inventory File**.

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Step 8 Click **Next** to confirm the bucket policy.

OBS then automatically creates a bucket policy on the destination bucket to grant OBS permission to write inventory files to the bucket.

Step 9 Click **OK**.

----End

Using APIs

Configuring a Bucket Inventory

Using SDKs

Java	Python: not supported	C: not supported	Go: not supported	BrowserJS: not supported	.NET: not supported	Android: not supported	iOS: not supported	PHP: not supported	Node.js: not supported

8.3 Event Notifications

8.3.1 EG-based Event Notifications

Scenarios

If you want operations performed on a bucket or its objects to be promptly detected and trigger subsequent operations, you can configure EventGrid (EG) event notifications.

For example, you can configure EG event notifications to automatically add watermarks to images uploaded to the source bucket and store the watermarked images to the target bucket.

How OBS Works with EG

OBS can store data such as files, images, and videos. Operations such as uploading, modifying, or deleting these objects can generate OBS events. After capturing OBS events, **EventGrid** (EG) automatically triggers subsequent operations or processes based on the configured rules. OBS automatically sends notifications, and EG automatically dispatches tasks, eliminating the need for manual intervention.

EG consists of the event source, channel, and event target:

- **Event source**: cloud service events generated when users request to operate cloud service resources
- **Channel**: the transfer station that receives events from cloud services

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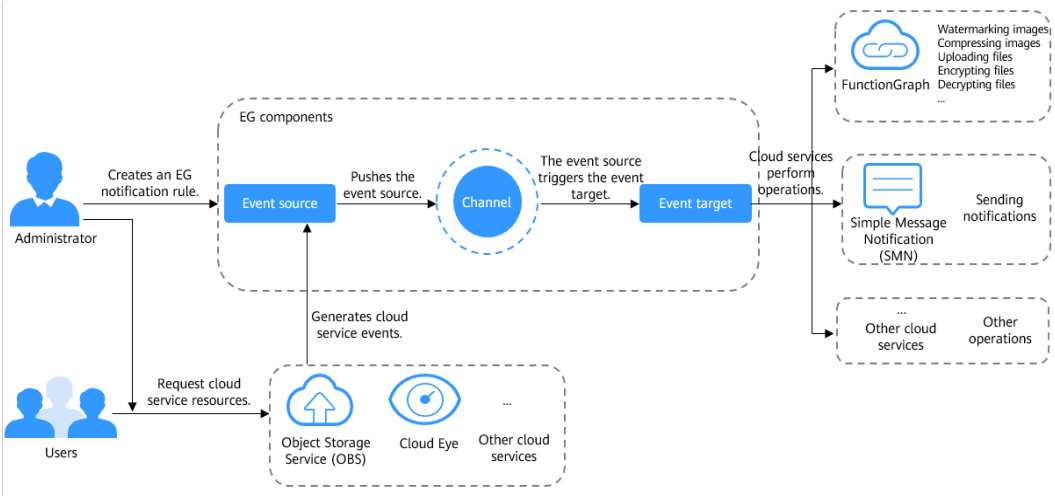
- **Event target**: the destination that processes events. Cloud service events from the channel can trigger other cloud services to perform operations. (For example, FunctionGraph can be triggered to add watermarks to images and store the images to OBS buckets.)

Figure 8-6 shows how OBS works with EG.

Figure 8-6 EG-enabled event notification



The process of using OBS together with EG is as follows:

1. An administrator creates an EG notification rule and configures the event source, channel, and event target.
2. When the administrator or other users perform operations on objects in OBS buckets, OBS events are generated as the event source.
3. EG pushes the event source to the event target through the channel, and the event target triggers other cloud services to perform subsequent operations.

Event Types Supported by OBS

EG notifications support two types of OBS event sources: **OBS Application Servicve** and **Object Storage Service (OBS)**.

- **OBS Application Service**: events about specific operations on bucket objects from OBS
- **Object Storage Service (OBS)**: events about bucket and system operations from OBS

Table 8-19 OBS event types supported by EG notifications

OBS Event Source Type	EG Event Type	Description
OBS Application Service	OBS:DWR:ObjectCreated:PUT	Uploading an object using PUT

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OBS Event Source Type	EG Event Type	Description
	OBS:DWR:ObjectCreated:POST	Uploading an object using POST
	OBS:DWR:ObjectCreated:COPY	Copying an object
	OBS:DWR:ObjectCreated:CompleteMultipartUpload	Assembling parts in a multipart upload
Object Storage Service (OBS)	OBS:CloudTrace:ApiCall	Audit log events generated due to operations triggered by calling API Gateway
	OBS:CloudTrace:ObsSDK	Audit log events generated due to operations on OBS buckets triggered by calling OBS SDKs
	OBS:CloudTrace:ConsoleAction	Audit log events generated due to operations performed on the **console**
	OBS:CloudTrace:SystemAction	Audit log events generated due to operations triggered internally
	OBS:CloudTrace:Others	Audit log events generated due to operations except those on OBS buckets triggered by calling SDKs

OBS Event Notification Message Structure

After an OBS event is generated due to an operation on a bucket's object, OBS sends an event notification in a fixed message structure (JSON format) to EG. Upon receiving the notification, EG triggers other cloud services to perform operations.

Message Structure Fields

An event notification sent by OBS to EG is a message in the following JSON structure:

```
{
   channel_id: "a1b2c3d4e5f678901234567890abcdef",
   events: [
      {
         specversion: "1.0",
         id: "17793124-84s5-5e1c-9s20-8fes5s8b54wf",
         source: "HC.OBS.DWR",
         type: "OBS:DWR:ObjectCreated:PUT",
         datacontenttype: "application/json",
         dataschema: "",
```

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```
        subject: "exampleobject",
        time: "Fri, 04 Jul 2025 06:08:01 GMT",
        ttl: "4000",
        data: {
            eventVersion: "3.0",
            eventSource: "OBS",
            eventRegion: "cn-east-3",
            eventTime: "2025-7-04T06:08:01.957Z",
            eventName: "ObjectCreated:PUT",
            userIdentity: {
                ID: "08b4efe0fc00d3ce0f17c01b948f6e80"
            },
            requestParameters: {
                sourceIPAddress: "x.x.x.x"
            },
            responseElements: {
                x-obs-request-id: "000001980D3CC5B5024FE333FEB97E7F",
                x-obs-id-2: "",
            },
            obs: {
                Version: "1.0",
                configurationId: "test-trigger",
                bucket: {
                    name: "examplebucket",
                    ownerIdentity: {
                        ID: "08b4efe0fc00d3ce0f17c01b948f6e80",
                    },
                    bucket: "examplebucket"
                },
                object: {
                    key: "exampleobject",
                    eTag: "65a8e27d8879283831b664bd8b7f0ad4",
                    size: "1024",
                    versionId: 9876543210987654321,
                    sequencer: "1",
                    oldpsxpth: ""
                }
            }
        }
    },
  ]
}
```


The fields are as follows:

Table 8-20 Fields in an EG event notification message

Field	Description
channel_id	Unique identifier of the EG event channel
events[].specversion	Version of the EG event specification
events[].id	Unique identifier of the EG event
events[].source	Source service name of the EG event. The value is fixed at **HC.OBS.DWR**.
events[].type	EG event type. The value is a character string separated by commas (,).
events[].datacontenttype	Content type of the EG event data. The value is fixed at **application/json**.
events[].dataschema	Pattern of the EG event data

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Field	Description
events[].subject	Object name
events[].time	Time when the EG event occurs. The UTC time format is used.
events[].ttl	Validity period of the EG event. The default value is 4 seconds.
events[].data.eventVersion	Version of the OBS message
events[].data.eventSource	Message source. The value is fixed at **OBS**.
events[].data.eventRegion	Region where the event occurs
events[].data.eventTime	Event time. The ISO-8601 format is used.
events[].data.eventName	Name of the event that triggers the notification
events[].data.userIdentity.ID	Billing ID of the user who triggers the event
events[].data.requestParameters.sourceIPAddress	Request source IP address
events[].data.responseElements.x-obs-request-id	Request ID
events[].data.responseElements.x-obs-id-2	Special symbol that helps troubleshoot faults
events[].data.obs.Version	OBS version
events[].data.obs.configurationId	Name of the OBS event trigger that matches the event
events[].data.obs.bucket.name	Bucket name
events[].data.obs.bucket.ownerIdentity.ID	Account ID of the bucket owner
events[].data.obs.bucket.bucket	Bucket name
events[].data.obs.object.key	Object name
events[].data.obs.object.eTag	Object ETag
events[].data.obs.object.size	Object size
events[].data.obs.object.versionId	Object version ID
events[].data.obs.object.sequencer	Identifier that determines the event sequence of a specific object
events[].data.obs.object.oldpsxpth	Path of the file before being renamed in the parallel file system

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Message Structure Examples

- Uploading an object

```
{
    channel_id: "a1b2c3d4e5f678901234567890abcdef",
    events: [
        {
            specversion: "1.0",
            id: "17793124-84s5-5e1c-9s20-8fes5s8b54wf",
            source: "HC.OBS.DWR",
            type: "OBS:DWR:ObjectCreated:PUT",
            datacontenttype: "application/json",
            dataschema: "",
            subject: "exampleobject",
            time: "Fri, 04 Jul 2025 06:08:01 GMT",
            ttl: "4000",
            data: {
                eventVersion: "3.0",
                eventSource: "OBS",
                eventRegion: "cn-east-3",
                eventTime: "2025-7-04T06:08:01.957Z",
                eventName: "ObjectCreated:PUT",
                userIdentity: {
                    ID: "08b4efe0fc00d3ce0f17c01b948f6e80"
                },
                requestParameters: {
                    sourceIPAddress: "x.x.x.x"
                },
                responseElements: {
                    x-obs-request-id: "000001980D3CC5B5024FE333FEB97E7F",
                    x-obs-id-2: "",
                },
                obs: {
                    Version: "1.0",
                    configurationId: "test-trigger",
                    bucket: {
                        name: "examplebucket",
                        ownerIdentity: {
                            ID: "08b4efe0fc00d3ce0f17c01b948f6e80",
                        },
                        bucket: "examplebucket"
                    },
                    object: {
                        key: "exampleobject",
                        eTag: "65a8e27d8879283831b664bd8b7f0ad4",
                        size: "1024",
                        versionId: 9876543210987654321,
                        sequencer: "1",
                        oldpsxpth: ""
                    }
                }
            }
        },
    ]
}
```

- Deleting an object (manually)

```
{
    channel_id: "a1b2c3d4e5f678901234567890abcdef",
    events: [
        {
            specversion: "1.0",
            id: "17793124-84s5-5e1c-9s20-8fes5s8b54wf",
            source: "HC.OBS.DWR",
            type: "OBS:DWR:ObjectRemoved:Delete",
            datacontenttype: "application/json",
            dataschema: "",
            subject: "exampleobject",
            time: "Fri, 04 Jul 2025 06:08:01 GMT",
            ttl: "4000",
```

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```
        data: {
            eventVersion: "3.0",
            eventSource: "OBS",
            eventRegion: "cn-east-3",
            eventTime: "2025-7-04T06:08:01.957Z",
            eventName: "ObjectRemoved:Delete",
            userIdentity: {
                ID: "08b4efe0fc00d3ce0f17c01b948f6e80"
            },
            requestParameters: {
                sourceIPAddress: "x.x.x.x"
            },
            responseElements: {
                x-obs-request-id: "000001980D3CC5B5024FE333FEB97E7F",
                x-obs-id-2: "",
            },
            obs: {
                Version: "1.0",
                configurationId: "test-trigger",
                bucket: {
                    name: "examplebucket",
                    ownerIdentity: {
                        ID: "08b4efe0fc00d3ce0f17c01b948f6e80",
                    },
                    bucket: "examplebucket"
                },
                object: {
                    key: "exampleobject",
                    eTag: "65a8e27d8879283831b664bd8b7f0ad4",
                    size: "1024",
                    versionId: 9876543210987654321,
                    sequencer: "1",
                    oldpsxpth: ""
                }
            }
        },
    ]
}
```

- Deleting an object (using a lifecycle rule)

```
{
    channel_id: "a1b2c3d4e5f678901234567890abcdef",
    events: [
        {
            specversion: "1.0",
            id: "17793124-84s5-5e1c-9s20-8fes5s8b54wf",
            source: "HC.OBS.DWR",
            type: "OBS:DWR:ObjectRemoved:Delete",
            datacontenttype: "application/json",
            dataschema: "",
            subject: "exampleobject",
            time: "Fri, 04 Jul 2025 06:08:01 GMT",
            ttl: "4000",
            data: {
                eventVersion: "3.0",
                eventSource: "OBS",
                eventRegion: "cn-east-3",
                eventTime: "2025-7-04T06:08:01.957Z",
                eventName: "ObjectRemoved:Delete",
                userIdentity: {
                    ID: "08b4efe0fc00d3ce0f17c01b948f6e80"
                },
                requestParameters: {
                    sourceIPAddress: "x.x.x.x"
                },
                responseElements: {
                    x-obs-request-id: "000001980D3CC5B5024FE333FEB97E7F",
                    x-obs-id-2: "",
                },
```

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```
            obs: {
                Version: "1.0",
                configurationId: "test-trigger",
                bucket: {
                    name: "examplebucket",
                    ownerIdentity: {
                        ID: "08b4efe0fc00d3ce0f17c01b948f6e80",
                    },
                    bucket: "examplebucket"
                },
                object: {
                    key: "exampleobject",
                    eTag: "65a8e27d8879283831b664bd8b7f0ad4",
                    size: "1024",
                    versionId: 9876543210987654321,
                    sequencer: "1",
                    oldpsxpth: ""
                }
            }
        }
    },
  ]
}
```

Constraints

Table 8-21 Constraints

Constraint	Description
OBS buckets	• A bucket can have a maximum of 10 EG notification rules configured. • EG notification rules configured for the same bucket cannot overlap with each other. If the notification rule you are creating overlaps with an existing one, the rule creation will fail.
Permissions	If you select **OBS Application Service** as the event source, your account must have the **Tenant Administrator** permission. For details, see **Assigning Dependency Roles**.
Creation of EG notification rules	• A subscription can be bound with up to five targets. • An event can be transmitted three times in an EG channel. • Event subscriptions cannot be used across accounts.
Editing of EG notification rules	• The event source provider cannot be changed. • The bound custom event channel cannot be changed.

EG Notification Billing

You need to pay for using EG. For details, see**EG Billing**.

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Prerequisites

- You **have enabled EG** and your account or IAM user has been granted the **EG FullAccess** permission.
- Your Huawei account or IAM user has been granted the **Tenant Administrator** permission. For details, see **Creating an IAM User and Granting OBS Permissions**.

Creating an EG Notification Rule

You can create EG notification rules on **OBS Console**.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane on the left, choose **Data Management** > **Event Notification**. The **EG** tab page is displayed.

Step 4 Click **Create** to go to the EG console and create an event subscription.

For details about how to use EG, see **Sending a Huawei Cloud Service Event**.

Step 5 Modify the subscription name and description.

1. Click next to the subscription name. In the **Configuration name and description** dialog box, modify the subscription name and description.

   The subscription name must start with a letter or digit and can contain a maximum of 128 characters, including letters, digits, periods (.), underscores (_), and hyphens (-).

2. Click **OK**.

Step 6 For enterprise users, select an enterprise project next to the subscription name. You can click **View Enterprise Projects** to view the enterprise project list.

If you do not have any specific needs for enterprise project division and management, choose the **default** enterprise project.

An enterprise project cannot be changed after being configured. Select an appropriate enterprise project based on your service requirements.

Step 7 Configure an event source.

1. Click **Event Source**. The **Event Source** dialog box is displayed on the right, as shown in **Figure 8-7**.

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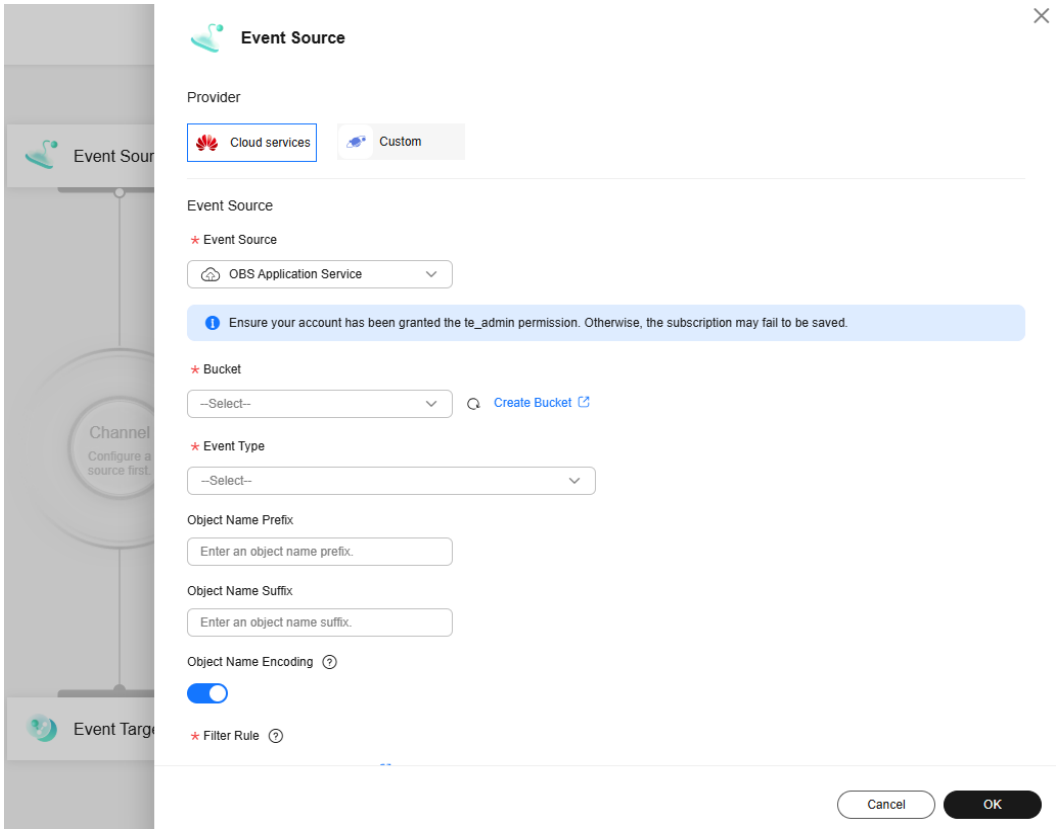
Figure 8-7 Configuring an event source



2. Select an event source provider.

   Retain the default value, that is, **Cloud services**.

3. Set event source parameters.

Table 8-22 OBS event source parameters

Parameter	Description
Event Source	Select a cloud service event source. To use OBS events as the event source, you can select either of the following event sources: – **OBS Application Service**: events about specific operations on bucket objects from OBS To select **OBS Application Service** as the event source, your account must have the **Tenant Administrator** permission. For details, see **Assigning Dependency Roles**. – **Object Storage Service (OBS)**: events about bucket and system operations from OBS
Bucket	This parameter is mandatory when **Event Source** is set to **OBS Application Service**. Select the bucket for generating OBS events. OBS events generated due to operations on this bucket or its objects will serve as the event source of EG notifications.

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Parameter	Description
Event Type	Configure OBS event types that trigger EG notifications based on operations performed on target objects. For example, if you want operations of uploading objects to the bucket to trigger EG notifications, you can select **OBS:DWR:ObjectCreated:PUT** and **OBS:DWR:ObjectCreated:POST**. You can specify multiple event types in an EG event notification rule. – **EG notification rules configured for the same bucket cannot overlap with each other. If the notification rule you are creating overlaps with an existing one, the rule creation will fail.** – **If you delete an object from a bucket with versioning enabled but do not specify the version ID, no object version is deleted by default, and no object deletion event notification will be triggered. Instead, the current object version becomes a historical one, and a delete marker is inserted as the new current version.** For details about the OBS event types supported by EG, see **Event Types Supported by OBS**.
Object Name Prefix	Optional This parameter is required if you set **Event Source** to **OBS Application Service** and need to specify specific objects for which events are generated. OBS events generated due to operations on objects with the specified object name prefix in the bucket will serve as the event source of EG notifications. – To match all objects in the bucket, leave both **Object Name Prefix** and **Object Name Suffix** empty. – To match all objects in the **testfolder** directory in the root directory of the bucket, set **Object Name Prefix** to **testfolder/** and leave **Object Name Suffix** empty. – To match all JPG objects in the bucket, leave **Object Name Prefix** empty and set **Object Name Suffix** to **.jpg**. – To match all MP3 objects in the **testfolder** directory in the root directory of the bucket, set **Object Name Prefix** to **testfolder/** and **Object Name Suffix** to **.mp3**.

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Parameter	Description
Object Name Suffix	Optional This parameter is required if you set **Event Source** to **OBS Application Service** and need to specify specific objects for which events are generated. OBS events generated due to operations on objects with the specified object name suffix in the bucket will serve as the event source of EG notifications. – To match all objects in the bucket, leave both **Object Name Prefix** and **Object Name Suffix** empty. – To match all objects in the **testfolder** directory in the root directory of the bucket, set **Object Name Prefix** to **testfolder/** and leave **Object Name Suffix** empty. – To match all JPG objects in the bucket, leave **Object Name Prefix** empty and set **Object Name Suffix** to **.jpg**. – To match all MP3 objects in the **testfolder** directory in the root directory of the bucket, set **Object Name Prefix** to **testfolder/** and **Object Name Suffix** to **.mp3**.
Object Name Encoding	Optional This parameter is required if you set **Event Source** to **OBS Application Service** and need to encode the names of objects for which events are generated. **If the function used in the event target decodes object names, enable this option so that the function can correctly read the object names.**

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Parameter	Description
Filter Rule	Event filter rule. Only events that match the filter rule will be pushed to the event target for subsequent operations. For example, if you want operations of uploading .jpg images to buckets except **test-bucket** to trigger EG event notifications, perform the following configurations: – **Event Source**: Select **OBS Application Service**. – **Bucket**: Select **test-bucket**. – **Event Type**: Select **OBS:DWR:ObjectCreated:PUT** and **OBS:DWR:ObjectCreated:POST**. – **Object Name Suffix**: Enter **.jpg**. – **Filter Rule**: Configure it as follows: `{ "source": [{ "op": "StringIn", "values": ["HC.OBS.DWR"] }], "type": [{ "op": "StringIn", "values": ["OBS:DWR:ObjectCreated:PUT", "OBS:DWR:ObjectCreated:POST"] }], "subject": { "and": [{ "op": "StringEndsWith", "values": [".jpg"] }] }, "data": { "obs": { "bucket": { "name": [{ "op": "StringNotIn", "values": ["test-bucket"] }] } } } }` For more information about filter rules, see **Filter Rule Parameters** and **Example Filter Rules**.

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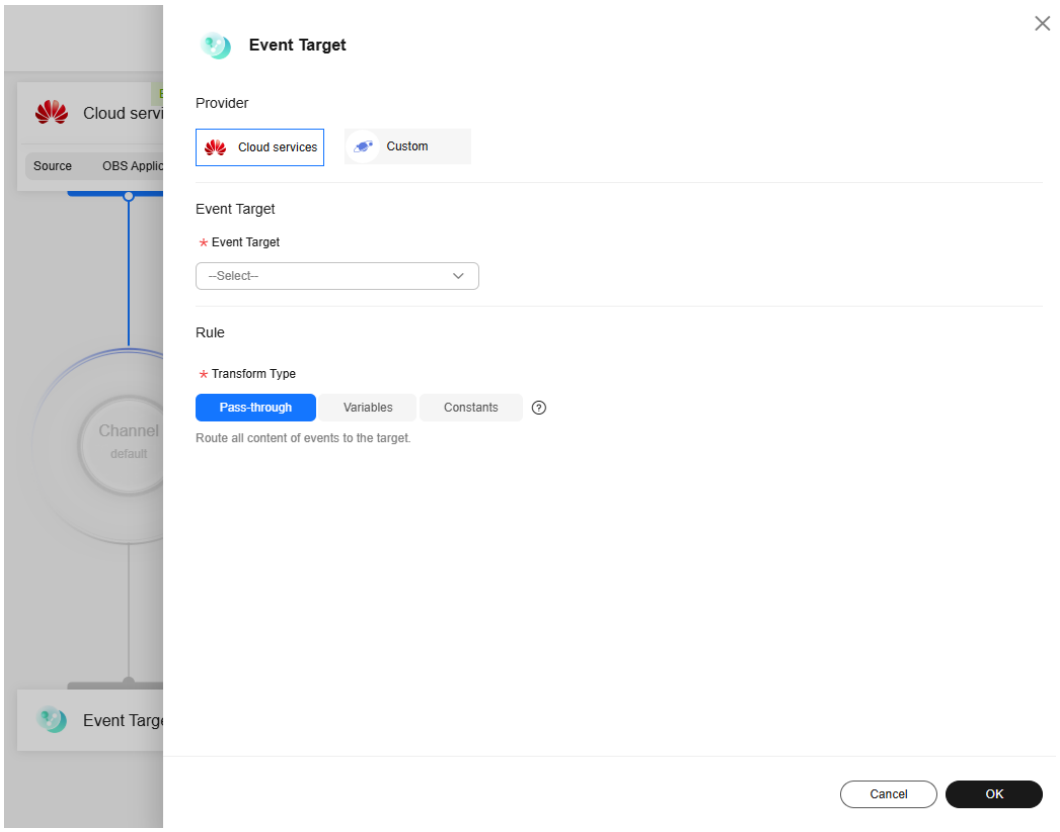
4. Click **OK**.

Step 8 Configure an event target.

1. Click **Event Target**.

Figure 8-8 Configuring an event target



2. Set event target parameters.
   - Select **Cloud services** as the event target provider. After receiving an event notification from the event source, the event target triggers cloud services to perform operations. Set the following parameters:

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Table 8-23 Selecting **Cloud services** as the event target provider

Parameter	Option	Description
Event Target	Simple Message Notification (SMN)	The event target dispatches tasks to SMN, triggering it to send messages. Set the following parameters: ■ **Topic**: Select a message topic. You need to create a topic in advance. For details, see **Creating a Topic**. ■ **Agency**: It grants EG the **smn:topic:publish** permission to publish messages. ○ The drop-down list displays only the agencies whose delegatee is EG. Ensure that the selected agency has the **smn:topic:publish** permission. ○ If no agency is available, click **Create Agency** to create one named **EG_SMN_PUBLISHER_AGENCY**. ■ **Type**: type of the message subject. If you want to specify the message subject in a fixed format, you can configure the message subject. Two types are available: ○ **Constants**: The subject does not change from specified. All messages will use the same subject. ○ **Variables**: The subject in the template is a variable value from CloudEvents-compliant events. Max.: 512 characters.

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Parameter	Option	Description
	FunctionGraph (function computing)	The event target dispatches tasks to FunctionGraph to execute related function operations. Set the following parameters: ■ **Function**: Select the function to trigger. If no function is available, **create a function** first. ■ **Version/Alias**: Choose to specify a version or alias. ○ **Version**: Select a version of the function. The default value is **latest**. ○ **Alias**: Select an alias of the function. ■ **Execute**: function invocation mode ○ **Asynchronously**: Immediate responses of function invocation are not required. ○ **Synchronously**: Immediate responses of function invocation are required. ■ **Agency**: It grants EG the **functiongraph:function:invoke*** permission to execute functions synchronously or asynchronously. ○ The drop-down list displays only the agencies whose delegatee is EG. Ensure that the selected agency has the **functiongraph:function:invoke*** permission. ○ If no agency is available, click **Create Agency** to create one named **EG_TARGET_AGENCY**.

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Parameter	Option	Description
Rule	Transform Type	EG transforms CloudEvents-compliant events for targets. The following three types are supported: ▪ **Pass-through**: Directly route CloudEvents-compliant events to the target. ▪ **Variables**: Route variables in CloudEvents-compliant events to the target. ○ **Parameters**: parameters that need to be transformed ○ **Template**: Create a template with the required variables for event transformation. ▪ **Constants**: Route constants in events to the target. For more information about transformation types, see **Event Content Transformation**.

– If you select **Custom** for **Provider**, set the following parameters:

Table 8-24 Selecting **Custom** for **Provider**

Parameter	Option	Description
URL	URL	Custom event target URL, which is used to consume events You must enter the URL of the event target starting with **http://** or **https://** and using the **POST** method. The default timeout for delivering events to the custom event target is 9 seconds. Exceeding this limit will cause delivery failure. The HTTP protocol has high security risks, which may cause data to be eavesdropped or tampered with. To ensure data security, you are advised to use HTTPS. If you must use HTTP, ensure that the custom event does not contain any sensitive information. You are responsible for all related risks.
	Connection	You can connect to the private webhook through the VPC and subnet connection. For details, see **Connections**.

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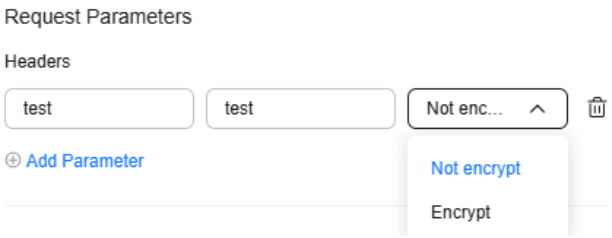
Parameter	Option	Description
Request Parameters	Headers	You can set request header parameters when requesting a URL. The settings include the request header parameter name, value, and whether encryption is enabled. **Figure 8-9** Headers  ■ Key (request header): Enter up to 256 characters starting and ending with a letter. Only letters and hyphens (-) are allowed. ■ Value: Enter up to 1,024 characters. Only letters, hyphens (-), underscores (_), spaces, and the following special characters are allowed: ~!@#$%^&*()=+|[{}];:'",<.>/? **NOTE** If the request header and value are invalid, the encryption option is unavailable.
Rule	Transform Type	EG transforms CloudEvents-compliant events for targets. The following three types are supported: ■ **Pass-through**: Directly route CloudEvents-compliant events to the target. ■ **Variables**: Route variables in CloudEvents-compliant events to the target. ○ **Parameters**: parameters that need to be transformed ○ **Template**: Create a template with the required variables for event transformation. ■ **Constants**: Route constants in events to the target. For more information about transformation types, see **Event Content Transformation**.

3. Click **OK**.

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Step 9 Click **Save** in the upper right corner of the page.

After an event subscription is created, you can view it in the event subscription list. The subscription status is **Enabled** by default.

----End

Disabling, Enabling, Modifying, or Deleting EG Notification Rules

You can disable, enable, modify, or delete EG notification rules on **OBS Console**.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane on the left, choose **Data Management** > **Event Notification**. The **EG** tab page is displayed.

Step 4 Click **Go to EG Console** in the operation column of the EG notification rule to be edited. The event subscription editing page is displayed.

- **Disabling or enabling an event subscription**
  a. Click **Disable** or **Enable** in the upper right corner of the page.
  b. Click **Save**.
     In the event subscription list, the status of the corresponding subscription is disabled or enabled.
- **Modifying an event subscription**: Modify the name, description, event source, and event target of the event subscription by referring to **Step 5**.
  Currently, the enterprise project to which an event subscription belongs cannot be modified.
- **Deleting an event subscription**
  a. Click **Delete** in the upper right corner of the page.
  b. In the **Delete Event Subscription** dialog box, click **Auto Enter**. The system automatically enters **DELETE**.
  c. Click **OK**.
     If the deleted subscription is not displayed in the event subscription list, the subscription is deleted successfully.

> **CAUTION**
>
> Deleted event subscriptions cannot be restored. Exercise caution when performing this operation.

----End

Exporting EG Notification Rules

You can export EG notification rules on **OBS Console**.

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Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane on the left, choose **Data Management** > **Event Notification**. The **EG** tab page is displayed.

Step 4 Choose **Export** > **Export all data to an XLSX file** to export all EG notification rules.

In the exported table, you can view the notification name, EG subscription name, event, prefix, suffix, EG channel, object name encoding, and OBS message format.

----End

References

- **Why Isn't an EG Event Notification Triggered When I Delete an Object?**
- **EventGrid (EG)**

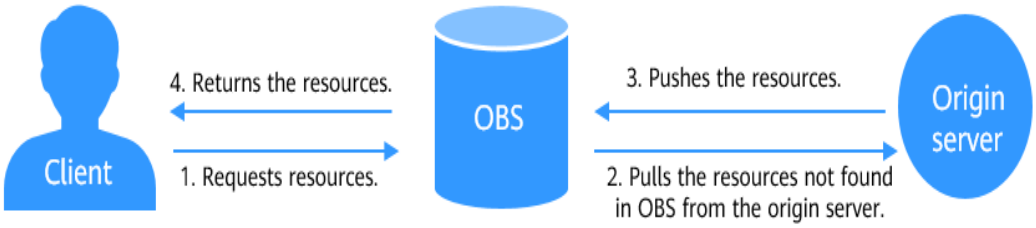
8.4 Using Mirroring-Based Back to Source to Retrieve Data

Usually, if the data requested by a client using GET is not found in OBS, a 404 error will be returned. To avoid this error, OBS provides back to source that pulls the requested data from the source site (origin server) if it is not found in OBS.

Process of Back to Source by Mirroring

If the data you requested is not found in a bucket that has a back-to-source by mirroring rule configured and the request matches the rule, OBS will pull the data from its origin server and return it to you. This process does not interrupt services. Therefore, you can use this function to seamlessly migrate data from the origin server to OBS without being sensed by users, at low costs. **Figure 8-10** shows the process of back to source by mirroring.

Figure 8-10 Process of back to source by mirroring



You can further configure a redirection address according to the settings of back to source by mirroring. If OBS fails to obtain resources from the origin server and the redirection rule is matched, OBS will return a 302 status code and a

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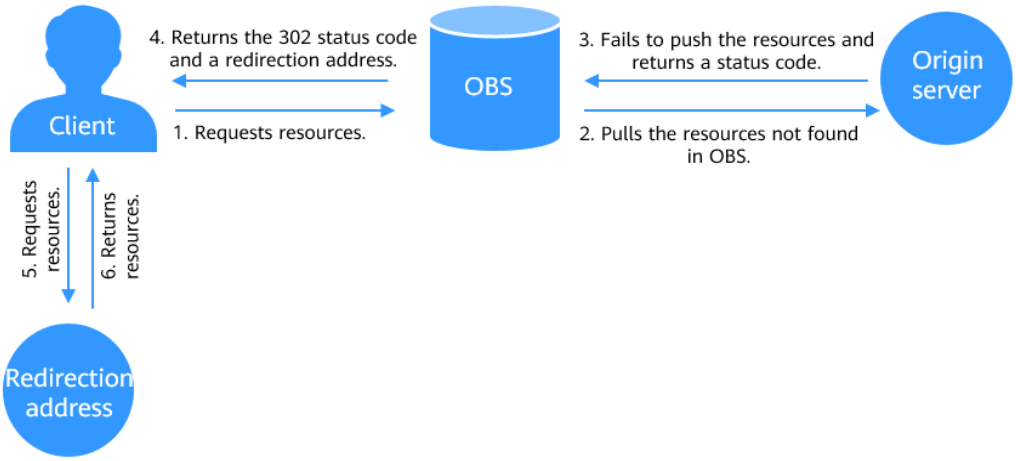
redirection address to the client. The client can directly request resources from the redirection address. Figure 8-11 shows the redirection process.

Figure 8-11 Process of redirecting a request



Back-to-Source Rules

Item	Description
Conditions for triggering an origin pull rule	OBS pulls data from the origin server only when a GetObject request results in a 404 response.
Rules for naming the retrieved files	If OBS retrieves a file from the origin server via **http(s)://MirrorURL/ObjectName**, the file is stored in OBS under the same name, **ObjectName**. For example, if the source address set for a bucket is **https://yun.com** and the requested file **example.jpg** is not found in the bucket, OBS will retrieve the file via **https://yun.com/example.jpg** and file **example.jpg** is then pushed to OBS.
Status code return rules in the case of retrieval failures	If OBS fails to retrieve a file from the source, it returns 404 to the client by default.
Rules for updating the retrieved files	If a file has been pushed by the origin server to OBS through mirroring, OBS does not update the file even if the source file changes.
HTTP request rules	By default, headers and query strings included in requests to OBS are not transferred to the origin server. However, you can configure the back to source settings to specify whether they should be passed along.

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Constraints

Table 8-25 Back to source constraints

Category	Description
Bucket versions	Only buckets of version 3.0 or later support back to source by mirroring.
Time	It takes about five minutes to apply any changes to a back-to-source by mirroring rule.
Number of rules	A maximum of 10 back-to-source by mirroring rules can be configured for a bucket.

Functions	• Anonymous users are not allowed to configure back-to-source by mirroring rules.
	• Federated users cannot use back to source by mirroring. For more information about federated users, see **What Are the Relationships Between a Huawei Cloud Account, HUAWEI ID, IAM User, and Federated User?** and **Introduction to Identity Providers**.
	• Parallel file systems do not support back-to-source by mirroring rules.
	• Static website hosting does not support back to source by mirroring. Specifically, if 404 is returned when you use a static website domain name to download an object, back to source by mirroring will not be triggered.
	• A bucket cannot mirror itself.
	• Currently, back to source by mirroring from private buckets is only supported for some cloud vendors.
	• **Transfer-Encoding: chunked** cannot be used for the origin server to transmit data, or the origin pull will fail. The response to the request for downloading an object from the origin server must contain the **Content-Length** header to specify the size of the source object. To achieve this, in the **Create/Edit Back-to-Source Rule** window, choose **Pass all parameters** for **HTTP Header Pass Rule**, enable **Do not pass specified parameters**, and add **Accept-Encoding**.
	• If NGINX was deployed as a reverse proxy for your origin server, turn off **chunked_transfer_encoding** of the NGINX.
	`location / {`
	`  chunked_transfer_encoding off;`
	`}`

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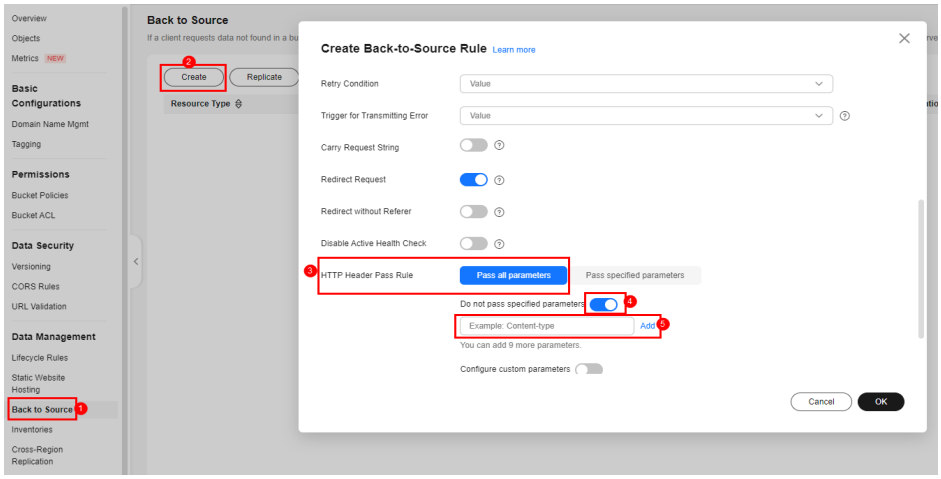
Category	Description
Permissions	• To configure, obtain, or delete back-to-source by mirroring rules, you must have the **Tenant Administrator** permission assigned by using IAM. • You must create a cloud service agency using IAM to delegate OBS to pull data from the origin server. The agency must include the **obs:object:PutObject**, **obs:object:GetObject**, **obs:bucket:ListBucket**, and **obs:object:AbortMultipartUpload** permissions. • If SSE-KMS is enabled for a bucket, the **kms:cmk:get**, **kms:cmk:list**, **kms:cmk:create**, **kms:dek:create**, and **kms:dek:crypto** permissions must be configured for the IAM agency for OBS.
Others	• Back to source by mirroring is free now. • An object cannot match two different back-to-source by mirroring rules.

Figure 8-12 Configuration method



Creating a Back-to-Source by Mirroring Rule

You can use **OBS Console** or APIs to create a back-to-source by mirroring rule.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Back to Source**.

Step 4 Click **Create**.

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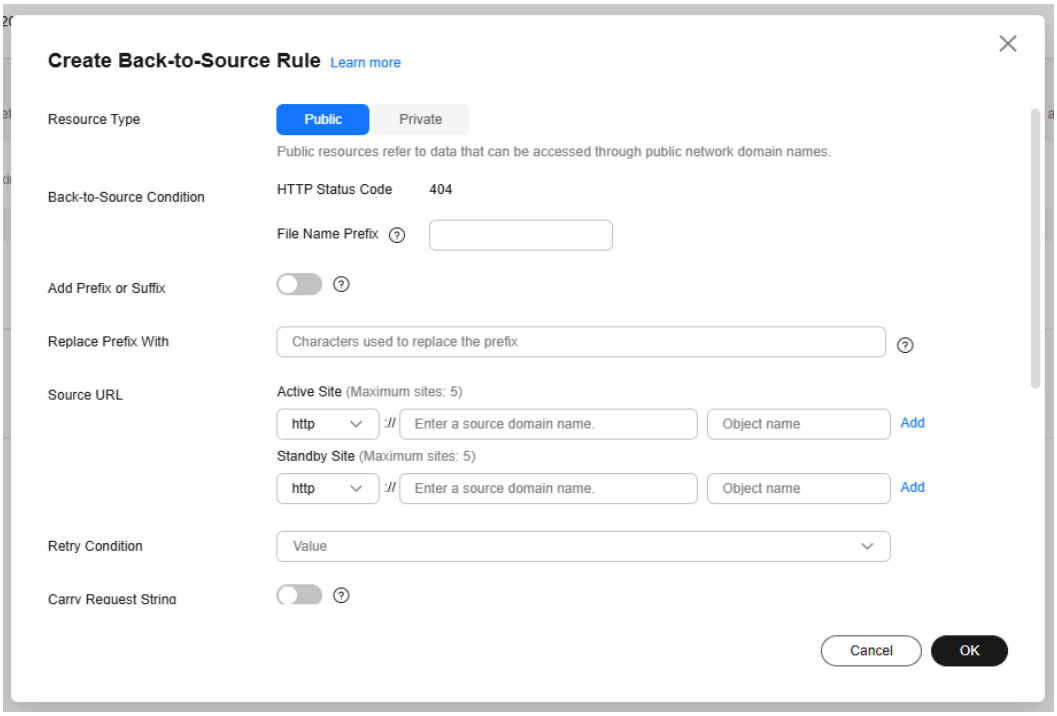
Figure 8-13 Creating a back-to-source by mirroring rule



Step 5 Configure parameters by referring to **Table 8-26**.

Table 8-26 Parameters for configuring a back-to-source by mirroring rule

Parameter	Description
Resource Type	The type of the origin server • **Public**: The origin server data comes from public object storage. • **Private**: The origin server data comes from private object storage of some cloud vendors.

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Parameter	Description
Back-to-Source Condition	The conditions that trigger the back-to-source rule The back-to-source rule is triggered when the following conditions are met: a. The requested object starts with the specified file name prefix. b. An HTTP status code 404 is returned because the object is not found in the bucket. The file name prefix: ● Cannot exceed 1,023 characters. ● Cannot contain or overlap with any other file name prefix specified for an existing rule. ● Can be left blank, which means that the rule applies to all files that do not meet the conditions of other back-to-source rules configured for the bucket. A bucket can have only one back-to-source rule that does not have a file name prefix specified. Example: The file name prefix is set to **123/**. A request for **123/456.txt** (that is not found in OBS) triggers OBS to pull **123/456.txt** from the origin server.
Add Prefix or Suffix	When OBS requests data from the origin server, it adds the specified prefix or suffix to the name of the object requested by the client. However, the object returned to OBS and the client retains its original name, without the added prefix or suffix. Example: The prefix is set to **123**. A request for **abc.txt** triggers OBS to pull **123abc.txt** from the origin server. However, the object is saved in OBS and returned to the client under its original name **abc.txt**.
Replace Prefix With	When OBS requests data from the origin server, it uses the characters specified here to replace the file name prefix defined in the back-to-source condition. However, the object returned to the client retains its original name. Example: The file name prefix is set to **123** as the back-to-source condition and **abc** is used to replace the prefix. In this case, a request for **123456.txt** triggers OBS to fetch **abc456.txt** from the origin server. However, the object is saved in OBS and returned to the client under its original name **123456.txt**.

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Parameter	Description
Source URL	The address of the origin server. Both active and standby sites can be configured. During the back-to-source process, OBS preferentially pulls data from the active site, or polls all active sites if multiple are available. If there are two or more active sites, when the first attempt to an active site fails and the retry conditions are met, OBS will retry another active site. There must be at least one active site. Up to five active sites can be configured. If data retrieval from all active sites fails, OBS will pull data from standby sites. Example site address: **http://***Source domain name***/***Static path* or **https://***Source domain name***/***Static path* ● *Source domain name* indicates the domain name of the origin server. – If the origin server is a bucket accessible over HTTP, use the bucket's domain name as *Source domain name*. – If the origin server is a private bucket hosted by another cloud vendor, use the regional domain name as *Source domain name*. At present, only private buckets of some cloud vendors are supported. ● *Static path* indicates the directory that stores the target file. For example, if the static path is **123/**, the target file is in the **123/** directory. ● The source URL can be an origin server IP address, and it must be a public IP address.
Retry Condition	When a retry is triggered **4XX** and specific status codes starting with **4** cannot be configured together. The same applies to **5XX** and specific status codes starting with **5**. A maximum of 20 status codes can be configured.
Include request strings	After this option is enabled, query parameters in the request URL will be passed to the origin server.
Redirect requests to the returned location	After this option is enabled, if redirection is configured for the origin server, the resources will be requested from the location included in the 3*xx* response returned by the origin server and be saved to OBS. Each request supports up to 10 redirects.
Redirect without Referer	If redirection has been configured for the origin server, enabling this option will remove the Referer header from requests during the redirection process.

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Parameter	Description
HTTP Header Pass Rule	You can specify the HTTP header parameters that can be passed to the origin server when a request sent to OBS triggers the back-to-source by mirroring rule. **Example for Configuring an HTTP Header Pass Rule** gives a configuration example. • **Pass all parameters**/**Pass specified parameters**: Set the HTTP header parameters that can be passed. • **Do not pass specified parameters**: Set the HTTP header parameters that cannot be passed. If a client's request includes the specified headers, OBS will not pass them to the origin server. If a header is specified for both the pass and do-not-pass categories, it is deemed as a do-not-pass parameter. • **Configure custom parameters**: You can set a custom value for a specified header. If a client request includes that header, OBS overrides it with the custom value before passing it to the origin server.
IAM Agency	An IAM agency is required to delegate OBS to pull data from the origin server. The agency must include the **obs:object:PutObject**, **obs:object:GetObject**, **obs:bucket:ListBucket**, and **obs:object:AbortMultipartUpload** permissions. If no such IAM agency is available, create one by referring to **Creating an Agency for Back to Source**.
Redirection Settings	After a redirection address is configured, if OBS fails to pull the requested resource from the origin server, OBS returns a 302 status code along with the redirection address to the client. The client then requests the resource from that address. **Redirection Match**: • **Forward match**: Back to source by redirection will be performed if the returned status code is any of those you specified. • **Reverse match**: Back to source by redirection will be performed if the returned status code is not among those you specified. **Redirection URL**: **http://***Source domain name*/*Static path* or **https://***Source domain name*/*Static path* • A source domain name is the domain name of the origin server to which requests are redirected. • *Static path* indicates the directory that stores the target file. For example, if the static path is **123/**, the target file is in the **123/** directory.

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Step 6 Click **OK**. After the rule is created, it appears in the list on the back to source page.

----End

Using APIs

Creating a Back-to-Source by Mirroring Rule

Replicating Back-to-Source by Mirroring Rules

You can use **OBS Console** to replicate back-to-source by mirroring rules.

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Back to Source**.

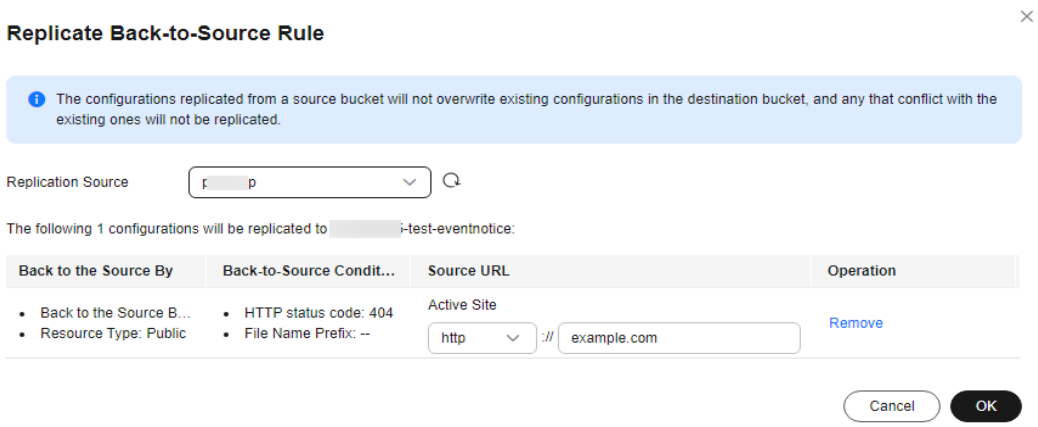
Step 4 Click **Replicate**.

Step 5 Select a replication source, which is bucket whose back-to-source rules you want to replicate.

NOTE

- The back-to-source rules replicated from a source bucket will not overwrite existing rules in the destination bucket, and any that conflict with the existing ones will not be replicated.
- The version of both source and destination buckets must be 3.0.
- Before replication, you can change the source URL. For details, see **Table 8-26**.
- You can remove the rules that you do not want to replicate.
- There can be five back-to-source rules at most in a bucket. If the number of rules you will replicate plus the number of existing rules in the destination bucket exceeds five, the replication will fail. Before replicating the rules, delete some if necessary.

Figure 8-14 Replicating back-to-source rules



Step 6 Click **OK** to replicate the rules to the destination bucket.

----End

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References

Back to Source by Mirroring Examples

Example 1

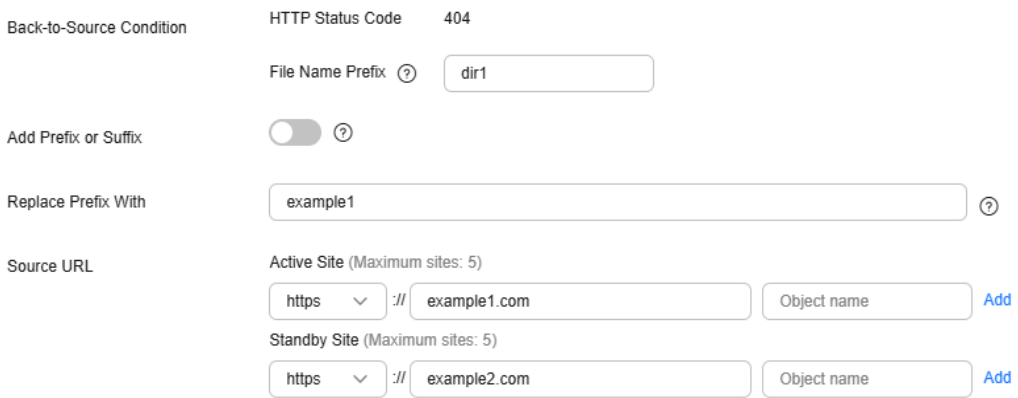
Assume that you created a bucket **bucket01** in the CN East-Shanghai1 region. The bucket has two origin servers configured: **A** (**https://example1.com**) and **B** (**https://example2.com**). The origin pull scenario is as follows:

- If a client accesses a file that does not exist in **bucket01/dir1**, OBS will pull the file from the **example1** directory on origin server **A**.
- If the **dir1** directory does not exist on origin server **A**, OBS will pull the file from the **example1** directory on origin server **B**.
- OBS requests the file from the returned redirection address if redirection has been configured for origin servers **A** and **B**.

Table 8-27 describes how to configure a back-to-source rule that matches this scenario.

Table 8-27 Configuring a back-to-source rule

Parameter	Description
Back-to-Source Condition	Set the file name prefix to the **dir1** directory in bucket **bucket01**.
Replace Prefix With	Set it to the **example1** directory on origin server **A**.
Source URL	Active site 1: Set the first column to **https** and the second column to **example1.com**. Leave the third column blank. Active site 2: Set the first column to **https** and the second column to **example2.com**. Leave the third column blank.
Redirect Request	Enable this option.



After this rule is configured, the access process is as follows:

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1. A client makes the first access to **https://bucket1.obs.cn-east-3.myhuaweicloud.com/dir1/example.txt**.
2. If the **example.txt** file does not exist in the **dir1** directory in **bucket01**, OBS requests the file from origin server **A** (**https://example1.com/example1/example.txt**).
   - If origin server **A** returns a 404 status code, OBS requests the file from origin server **B** (**https://example2.com/example1/example.txt**).
   - If origin server **A** or **B** returns a 3*xx* status code, OBS sends a request to the redirection address returned by the origin server. After obtaining the file, OBS saves the file as **dir1/example1/example.txt** to **bucket01** and returns the file to the client.

Example 2

Assume that you created a bucket **bucket02** in the CN East-Shanghai1 region. The bucket has one origin server configured: **A** (**https://example1.com**). The origin pull scenario is as follows:

- If a client accesses a file that does not exist in **bucket02/example1**, OBS will pull the file from the **example1** directory on origin server **A**.
- Query strings in the request URL can be passed to the origin server.
- HTTP headers (**header1**, **header2**, and **header3**) included in the request URL can be passed to the origin server.

  Table 8-28 describes how to configure a back-to-source rule that matches this scenario.

Table 8-28 Configuring a back-to-source rule

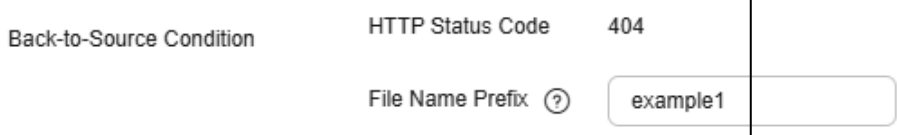
Parameter	Description
Back-to-Source Condition	Set the file name prefix to the **example1** directory in bucket **bucket02**. 
Source URL	Set the first column to **https** and the second column to **example1.com**. Leave the third column blank. Figure 8-15 shows the settings.
Carry Request String	Enable this option.
HTTP Header Pass Rule	Select **Pass specified parameters** and add the HTTP headers **header1**, **header2**, and **header3**. Figure 8-16 shows the settings.

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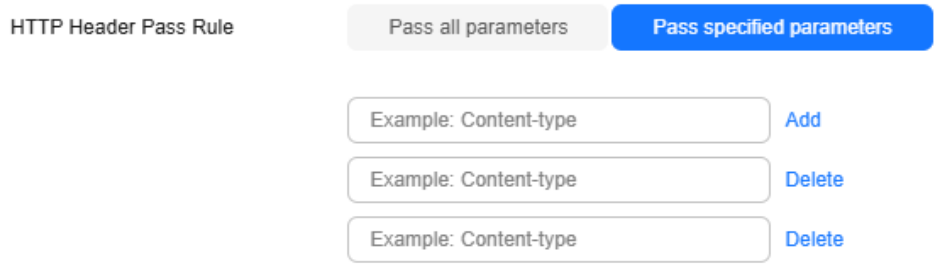
Figure 8-15 Source URL

Figure 8-16 HTTP Header Pass Rule



After this rule is configured, the access process is as follows:

a. A client makes the first access to **https://bucket02.obs.cn-east-3.myhuaweicloud.com/example1/example.png?name=yun&production=obs**.

b. If the **example.png** file does not exist in the **example1** directory in **bucket02**, OBS requests the file from origin server **A** (**https://example1.com/example1/example.png?name=yun&production=obs**).

c. The origin server returns the **example.png** file to OBS according to the passed **name=yun&production=obs** parameter.

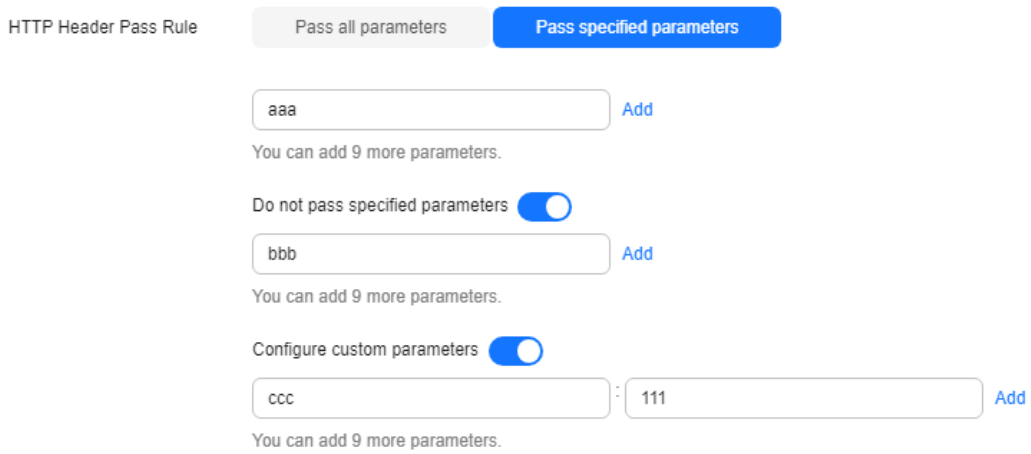
d. OBS names the obtained file **example1/example.png** and stores it to **bucket02**.

   If the request also contains the HTTP headers **header1**, **header2**, and **header3**, OBS will also pass them to origin server **A**.

Example for Configuring an HTTP Header Pass Rule

Assume that the parameters are set as shown in **Figure 8-17**.

Figure 8-17 Configuring an HTTP header pass rule



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Based on the preceding configuration, if the header of the request sent to OBS is as follows:

```
GET /ObjectName HTTP/1.1
Host: bucketname.obs.region.myhuaweicloud.com
aaa:aaa
bbb:bbb
ccc:ccc
```

After the back-to-source rule is triggered, OBS sends the following request to the origin server:

```
GET /ObjectName HTTP/1.1
Host: source.com
aaa:aaa
ccc:111
```

Notes for passing HTTP headers during back to source

- HTTP headers that can be passed from an origin server to a client:
  - Content-Type
  - Content-Language
  - Content-Encoding
  - Content-Disposition
  - Cache-Control
  - Expires
- HTTP headers that cannot be passed from a client to an origin server:
  a. HTTP headers starting with the prefix below:
     x-obs-
  b. All standard HTTP headers, including:
     - Content-Length
     - Authorization2
     - Authorization
     - Range
     - Date

Creating an Agency for Back to Source

Step 1 In the **Create Back-to-Source Rule** dialog box on OBS Console, click **View Agencies** to jump to the **Agencies** page on the IAM console.

Step 2 Click **Create Agency**.

Step 3 Enter an agency name.

Step 4 Select **Cloud service** for the **Agency Type**.

Step 5 Select **Object Storage Service (OBS)** for **Cloud Service**.

Step 6 Set a validity period.

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Step 7 Click **Next**.

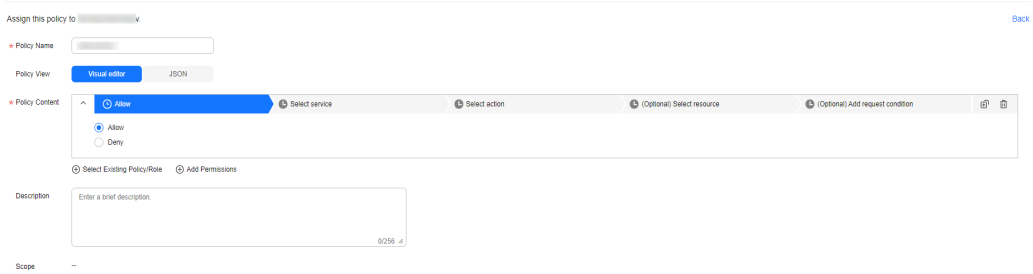
NOTE

The console for creating an agency has the new and old editions. The following steps use the new edition.

Step 8 Click **Done**. In the displayed dialog box, click **Authorize**.

Step 9 If there is already a policy meeting your requirements, go to **Step 11**. Otherwise, click **Create Policy** in the upper right corner. Then, specify a policy name and choose **Visual editor** for **Policy View**.

Figure 8-18 Authorizing an agency



Step 10 Configure **Policy Content** as follows:

1. Select **Allow**.
2. For the service, select **Object Storage Service (OBS)**.
3. For actions, under **ReadOnly**, select **obs:object:GetObject**, under **Read/Write**, select **obs:object:PutObject** and **obs:object:AbortMultipartUpload**, and under **ListOnly**, select **obs:bucket:ListBucket**.
4. For **Resources**, select **All**.
5. Click **Next**.

Step 11 Select the policy and click **Next**.

Step 12 On the **Select Scope** page, select **All resources** for **Scope** and click **OK**.

NOTE

All resources is the recommended option for **Scope**. In this policy, the **All resources** option means that OBS can use all resources, including those in enterprise projects, region-specific projects, and global services under the account based on assigned permissions.

----End

8.5 Static Website Hosting

Scenarios

OBS allows static websites to be hosted by buckets and supports index page, error page, and page redirection. To host a static website in OBS, upload the static website files to a bucket, grant the read permission for these files to anonymous users, and configure static website hosting for the bucket.

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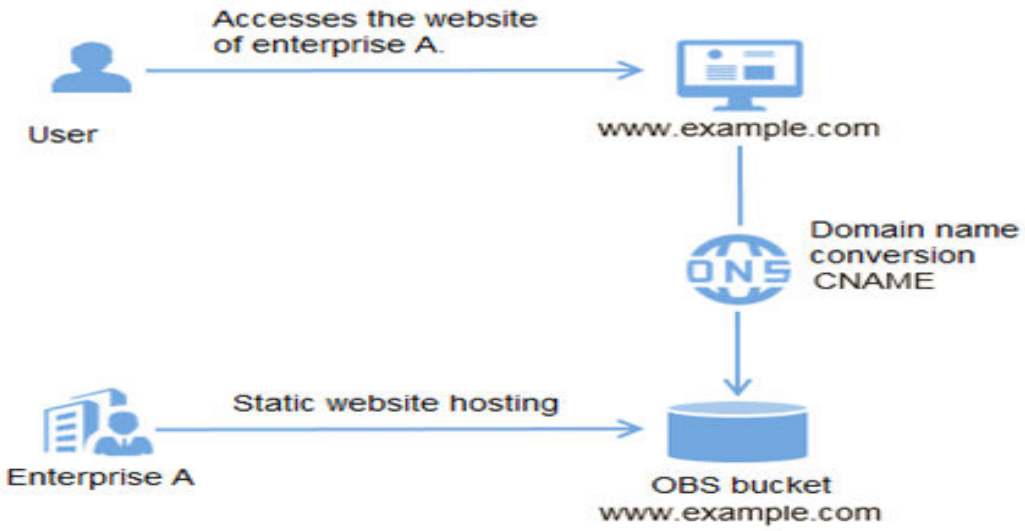
Static websites contain static web pages and some scripts that can run on clients, such as JavaScript and Flash. Different from static websites, dynamic websites rely on servers to process scripts, such as PHP, JSP, and ASP.NET. OBS does not support scripts running on servers.

Figure 8-19 Static website hosting



After static website hosting is configured, you can access OBS in either of the following ways:

- Resource management mode: You can access OBS using a common domain name. You can use APIs or SDKs and default OBS domain names with endpoints contained to perform common operations on buckets and objects, such as upload, download, deletion, or listing.
- Static website: You can access objects in a bucket by using a specific domain name. You can configure domain name hosting rules to enable redirection of an index page, error page, or access page.

The configuration of static website hosting takes about two minutes to take effect. After it takes effect, you can access static resources using the following URLs:

https://*static-website-domain-name***/***object-name*
http://*static-website-domain-name***/***object-name*

A static website domain name is in the *BucketName***.obs-website.***Endpoint* format. *BucketName* indicates the name of a bucket, and *Endpoint* indicates the OBS domain name of the region where the bucket is located. For details about regions and endpoints, see **Regions and Endpoints**. For example, if you want to access bucket **testbucket** in the CN-Hong Kong region, the corresponding endpoint is **ap-southeast-1.myhuaweicloud.com**, and the static website domain name is **testbucket.obs-website.ap-southeast-1.myhuaweicloud.com**.

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NOTE

- Avoid using periods (.) in the target bucket name, or there may be errors when the client verifies the certificate during HTTPS access.
- In static website hosting scenarios, anonymous users must be granted access to hosted static website files. When they access the hosted files over public networks, there will be costs for outbound Internet traffic and requests.

To allow your users to access the content on your website, you must assign public read to your content. You can use bucket policies or ACLs on objects to grant permissions.

The following table lists the differences between the resource management mode and static website mode.

Main Difference	Resource Management	Static Website
Access control	Both public content and private content are supported.	Only publicly readable content is supported.
Error handling	An error response in XML format is returned.	An HTML document is returned.
Redirection support	N/A	Both object-level and bucket-level redirection are supported.
Supported requests	All operations on buckets and objects are supported.	Only GET and HEAD requests on objects are supported.
Response to GET and HEAD requests at the root level of a bucket	A list of object keys in a bucket is returned.	An index file specified in the configuration is returned.

Precautions

For security and compliance purposes, Huawei Cloud OBS does not allow you to use static website hosting based on the default domain name (**a bucket domain name or static website domain name**). When you use such a domain name to access web pages in a browser, no content will be displayed. Instead, the content is downloaded as an attachment.

This restriction takes effect in different regions at the following two points in time:

January 1, 2022: CN North-Beijing1, CN North-Beijing4, CN East-Shanghai1, CN East-Shanghai2, and CN South-Guangzhou

March 25, 2022: CN-Hong Kong, AP-Bangkok, AP-Singapore, AF-Johannesburg, LA-Mexico City1, LA-Mexico City2, LA-Sao Paulo1, and LA-Santiago

You can still use static website hosting with a user-defined domain name. This way, the content can still be previewed. For details, see **How Do I Preview OBS Objects in My Web Browser?**

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Configuring Static Website Hosting

Description

If you want to use a bucket to host static websites, add the website configuration to the bucket. The configuration includes the following information:

Index document

When you enter a URL such as **http://example.com**, you are not requesting a specific page. In this case, the web server will provide a default page that contains the directory of the requested website. This default page is called an index document, and in most cases it is known as **index.html**. When you configure a bucket for website hosting, you must specify an index document. When a request is sent to the root domain or any subfolder, OBS returns this index document.

Error document

If an error occurs, OBS returns an HTML error document. For 4*XX* errors, you can provide your own custom error document that gives users guidance to address the error.

Redirection of all requests

If the root domain is **example.com** and you need to respond to requests for **http://example.com** and **http://www.example.com**, you can create two buckets named **example.com** and **www.example.com**, respectively. Then you store the website content in only one bucket (such as **example.com**), and configure the other bucket to redirect all requests to the **example.com** bucket.

Redirection based on advanced conditions

You can redirect requests based on the specific object name or prefix in the request, or based on the response code. For example, if you deleted or renamed an object in a bucket, you can add a routing rule to redirect requests for this object to another object.

The syntax format is as follows:

```
<WebsiteConfiguration>
   <IndexDocument>
      <Suffix>index.html</Suffix></IndexDocument>
   <ErrorDocument>
      <Key>SomeErrorDocument.html</Key>
   </ErrorDocument>
   <RoutingRules>
      ……RoutingRules……
   </RoutingRules>
</WebsiteConfiguration>
```

Here is the syntax format of **RoutingRules**. The content in square brackets ([]) is optional.

```
<RoutingRules> =
   <RoutingRules>
      <RoutingRule>...</RoutingRule>
      [<RoutingRule>...</RoutingRule> ...]
   </RoutingRules>

<RoutingRule> =
   <RoutingRule>
      [ <Condition>...</Condition> ]
      <Redirect>...</Redirect>
```

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```
  </RoutingRule>

<Condition> =
  <Condition>
    [ <KeyPrefixEquals>...</KeyPrefixEquals> ]
    [ <HttpErrorCodeReturnedEquals>...</HttpErrorCodeReturnedEquals> ]
  </Condition>

<Redirect> =
  <Redirect>
    [ <HostName>...</HostName> ]
    [ <Protocol>...</Protocol> ]
    [ <ReplaceKeyPrefixWith>...</ReplaceKeyPrefixWith> ]
    [ <ReplaceKeyWith>...</ReplaceKeyWith> ][
    <HttpRedirectCode>...</HttpRedirectCode> ]
  </Redirect>
```

For website configuration for redirecting all requests and for setting redirection rules, see the "Request Elements" section in **Configuring Static Website Hosting for a Bucket**.

Examples:

Example 1: Modifying the object name prefix for redirection

Assume that your bucket contains the following objects:

index.html

docs/article1.html

docs/article2.html

You decide to change the object name from **docs/** to **documents/**. After the modification, the request for an object with prefix **/docs** needs to be redirected to **documents/**. For example, the request for **docs/article1.html** needs to be redirected to **documents/article1.html**.

To meet this need, you can add the following routing rule to the website configuration:

```
<RoutingRules>
  <RoutingRule>
  <Condition>
    <KeyPrefixEquals>docs/</KeyPrefixEquals>
  </Condition>
  <Redirect>
    <ReplaceKeyPrefixWith>documents/</ReplaceKeyPrefixWith>
  </Redirect>
  </RoutingRule>
</RoutingRules>
```

Example 2: Redirecting requests sent to deleted folders to a specified page

Assume that you have deleted the **images/** folder, that is, you have deleted all objects whose object name prefix is **images/**. You can add a routing rule that redirects the requests of all objects whose prefix is **images/** to a page named **folderdeleted.html**.

```
<RoutingRules>
  <RoutingRule>
  <Condition>
    <KeyPrefixEquals>images/</KeyPrefixEquals>
  </Condition>
  <Redirect>
    <ReplaceKeyWith>folderdeleted.html</ReplaceKeyWith>
```

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```
  </Redirect>
  </RoutingRule>
 </RoutingRules>
```

Example 3: Redirection when HTTP errors occur

You want to redirect requests for an object that is not found to **www.example.com**. You can add a routing rule to redirect users to **www.example.com** if HTTP status code 404 (object not found) is returned. The following example inserts the object name prefix **report-404/** into **Redirect**. Assume you request the page **ExamplePage.html** and receive an HTTP 404 error. In this case, you will be redirected to the page **report-404/ExamplePage.html** on the **www.example.com**. If there is no routing rule and HTTP error 404 occurs, the error document specified in the configuration is returned.

```
<RoutingRules>
  <RoutingRule>
  <Condition>
    <HttpErrorCodeReturnedEquals>404</HttpErrorCodeReturnedEquals >
  </Condition>
  <Redirect>
    <HostName>www.example.com</HostName>
    <ReplaceKeyPrefixWith>report-404/</ReplaceKeyPrefixWith>
  </Redirect>
  </RoutingRule>
 </RoutingRules>
```

Index Document Support

An index document is a web page returned when a request is sent to the root of a website or any subfolder. For example, if the user enters **http://www.example.com** in the browser, the user is not requesting any specific page. In this case, OBS provides an index document, also known as a default page.

When configuring website hosting for your bucket, you must provide the name of an index document, which must be uploaded to OBS and configured with public read.

The trailing slash (/) in the root URL is optional. Both the following URLs can return an index document.

```
http://bucketname.obs-website.example.com/
http://bucketname.obs-website.example.com
```

In OBS, objects are stored in buckets horizontally, not in a hierarchical structure like that of a file system on a computer. You can create a logical hierarchy based on object names that represent a folder structure. For example, consider a bucket with the following three objects:

- sample1.jpg
- photos/2006/Jan/sample2.jpg
- photos/2006/Feb/sample3.jpg

Although they are not stored in a hierarchical structure, you can infer the following logical relationship from their object name.

- The **sample1.jpg** object is located at the root level of the bucket.
- The **sample2.jpg** object is located in the **photos/2006/Jan** subfolder.
- The **sample3.jpg** object is located in the **photos/2006/Feb** subfolder.

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Custom Error Document Support

Table 8-29 lists the HTTP response codes returned by OBS when an error occurs.

Table 8-29 List of OBS error codes

HTTP Error Code	Description
301 Moved Permanently	When a user sends a request to an endpoint of OBS, a **301 Moved Permanently** response is returned.
302 Found	When OBS receives a request for key *x* that does not end with a slash, it searches for the object whose key name is *x*. If the object is not found, OBS determines that the request is sent for subfolder **x**. Then OBS redirects the request by adding a slash to the end of **x** and returns **302 Found**.
304 Not Modified	OBS users request the **If-Modified-Since** and **If-Unmodified-Since** headers to determine whether the requested object is the same as the cached copy stored on the client. If the objects are the same, the website endpoint returns a **304 Not Modified** response.
403 Forbidden	If the requested object is changed to deny public read, a request for this object will receive a **403 Forbidden** response. An object owner must use bucket policies or ACLs to allow public read for the object.

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HTTP Error Code	Description
404 Not Found	This response is returned if: • OBS determines that an invalid object key is referenced in the website URL. • The OBS determines that the request is for an index document that does not exist. • The bucket specified in the URL does not exist. • The bucket specified in the URL exists but is not configured as a website. You can create a custom document that will be returned if **404 Not Found** occurs. Ensure that the document has been uploaded to a bucket configured as a website and the document has been configured as an error document in the website hosting configuration.
500 Service Error	If there is an internal server error, a **500 Service Error** response is returned.
503 Service Unavailable	If your requests are too frequent, a **503 Service Unavailable** response is returned.

Permissions Required for Website Access

When you configure a bucket as a website, you must configure public read for the objects in the bucket. To perform this operation, you need to write a bucket policy that grants the GetObject permission to everyone. If an object requested by a user does not exist on the website, OBS returns the HTTP response code **404 Not Found**. If the object exists but you did not grant read permission for the object, OBS returns HTTP response code **403 Access Denied**. Requesters can use the response code to determine whether the requested object exists. If you do not need this function, do not enable the bucket website support.

NOTE

In static website hosting scenarios, anonymous users must be granted access to hosted static website files. When they access the hosted files, there will be costs for outbound Internet traffic and requests.

The following example bucket policy grants everyone the permission to access objects in a specified folder. For more information about bucket policies, see **Bucket Policy**.

```
{
  "Statement":[{
```

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```
    "Sid":"PublicReadGetObject",
      "Effect":"Allow",
      "Principal": {"ID":"*"},
      "Action":["GetObject"],
      "Resource":["example-bucket/*"  ]
    }
  ]
}
```

NOTICE

A bucket policy applies only to objects owned by a bucket owner. If the bucket contains objects that are not owned by the bucket owner, use object ACLs to grant the public read permission for the objects.

You can use bucket policies or object ACLs to grant the public read permission for your objects. To use ACLs to grant the read permission to everyone, refer to the example below. You can add the authorization element to object ACLs. For details about ACL management, see **ACLs**.

```
<Grant>
  <Grantee>
    <Canned>Everyone</Canned>
  </Grantee>
  <Permission>READ</Permission>
</Grant>
```

Related Functions

Function	Relationship with Static Website Hosting	Reference
Cross-origin resource sharing (CORS)	By default, static websites hosted in an OBS bucket can only respond to access requests from websites in the same domain. You can configure CORS for the bucket so static websites can be accessed from a different origin.	**Configuring CORS to Allow Cross-Origin Access to OBS**
User-defined domain name configuration	OBS allows you to continue to use the original domain name of your static website hosted in OBS by configuring a user-defined domain name, with no code change required. **NOTE** To protect your services from being affected by the takeover of Huawei Cloud public domain names by relevant organizations, you are advised to use a user-defined domain name to access a bucket.	**Configuring User-defined Domain Names** **Using a User-Defined Domain Name to Host a Static Website**
URL validation	OBS uses URL validation to protect your website from inline linking. OBS verifies URLs based on the referer field in the HTTP header.	**Configuring URL Validation to Prevent Unauthorized Access to Your Data**

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Prerequisites

Web page files required for static website hosting have been uploaded to the specified bucket.

The static website files hosted in the bucket are accessible to all users.

Static web page files in the Archive or Deep Archive storage class have been restored. For more information, see **Restoring Archive or Deep Archive Objects**.

Ways to Configure Static Website Hosting

You can use **OBS Console**, APIs, or SDKs to configure static website hosting.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 (**Optional**) If the static website files in the bucket are not accessible to everyone, perform this step. If they are already accessible to everyone, skip this step.

To grant required permissions, see **Granting All Accounts Read Permission for Specified Objects**.

If the bucket contains only static website files, configure the **Object Read-Only** policy for the bucket, so that all files in it are publicly accessible.

1. Choose **Permissions** > **Bucket Policies**.
2. Click **Create**.
3. Configure bucket policy information.

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Figure 8-20 Granting the Object Read-Only permission

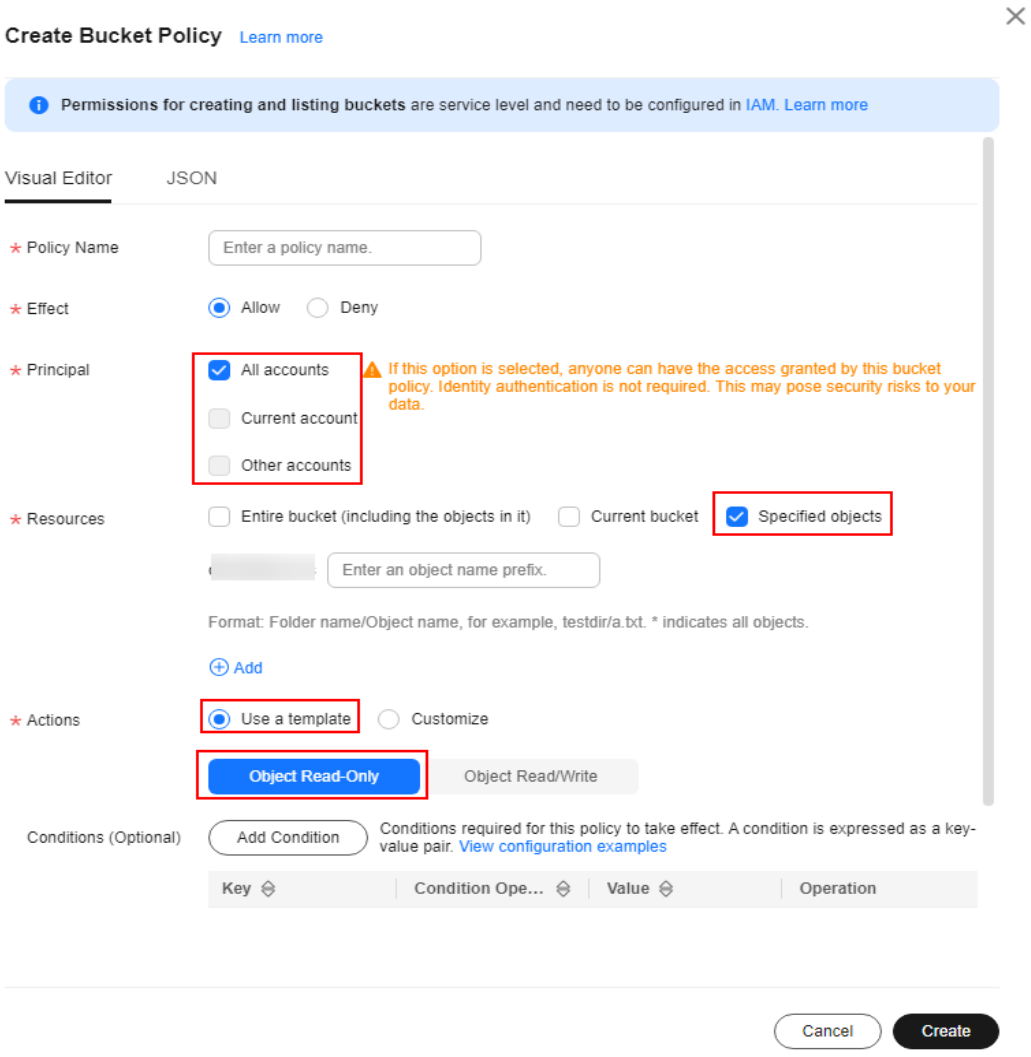

Table 8-30 Parameters for configuring a public read policy

Parameter		Description
Configuration method		– **Visual Editor**: You can configure through a visualized interface in an easy way. – **JSON**: You can configure by coding in JSON format. The visual editor is used here. For details about configurations in the JSON view, see **Creating a Custom Bucket Policy (JSON View)**.
Policy Name		Enter a custom policy name.
Policy content	Effect	Select **Allow**.
	Principal	Select **All accounts**.

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Parameter		Description
	Resources	– Select **Specified objects**. – Set the resource path to ***** (indicating all objects in the bucket).
	Actions	– Choose **Use a template**. – Select **Object Read-Only**.

4. Click **Create**. The bucket policy is created.

Step 4 In the navigation pane, choose **Data Management** > **Static Website Hosting**.

Step 5 Click **Configure Static Website Hosting**. The **Configure Static Website Hosting** dialog box is displayed.

Step 6 Turn on the **Status** switch and configure parameters.

Table 8-31 Setting **Hosting Type** to **Host a static website**

Parameter	Example	Description
Status	Enable this option.	-
Hosting Type	**Host a static website**	Select **Host a static website**.
Homepage	**index.html**	• **Homepage**: specifies the default homepage of the static website. When **OBS Console** is used to configure static website hosting, only HTML web pages are supported; when APIs are used, OBS does not have such a restriction, but the object's Content-Type must be specified. OBS only allows files such as **index.html** in the root directory of a bucket to function as the default homepage. Do not set the default homepage with a multi-level directory structure (for example, **/page/index.html**).
404 Error Page	**error.html**	• **404 Error Page**: specifies the error page returned when an error occurs during static website access. When **OBS Console** is used to configure static website hosting, only HTML, JPG, PNG, BMP, and WebP files in the root directory of a bucket are supported; when APIs are used, OBS does not have such a restriction, but the object's Content-Type must be specified.

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Parameter	Example	Description
Redirection Rule	Example	In **Redirection Rule**, configure redirection rules. Requests that comply with the redirection rules are redirected to the specific host or page. A redirection rule is compiled in JSON format. Each rule contains a **Condition** and a **Redirect**. The parameters are described in **Table 8-33**.

Table 8-32 Setting **Hosting Type** to **Redirect requests**

Parameter	Example	Description
Status	Enable this option.	-
Hosting Type	Redirect requests	Select **Redirect requests**.
Redirect To	www.example.com	Enter a bucket access domain name or a URL.

Figure 8-21 Configuring static website hosting

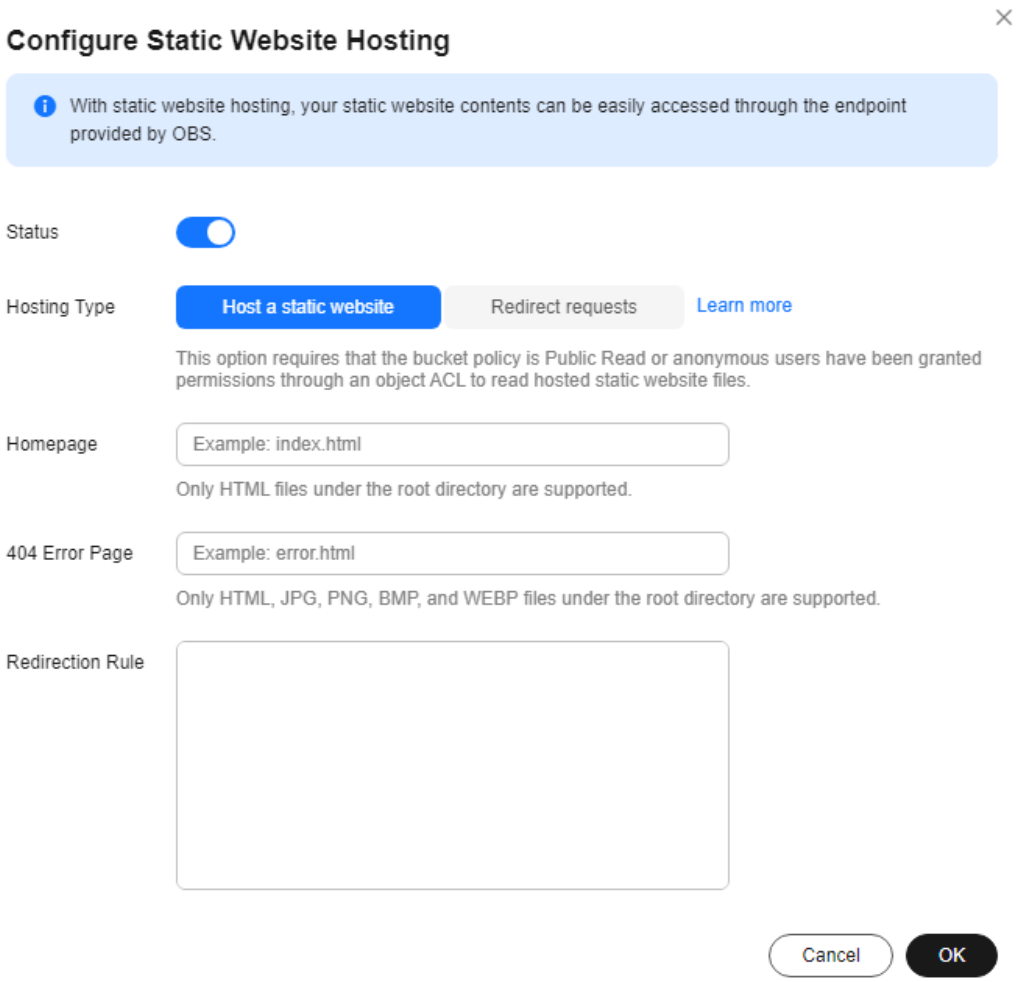

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Table 8-33 Redirection parameter description

Container	Key	Description
Condition	KeyPrefixEquals	Object name prefix on which the redirection rule takes effect. When a request is sent for accessing an object, the redirection rule takes effect if the object name prefix matches the value specified for this parameter. For example, to redirect the request for object **ExamplePage.html**, set the **KeyPrefixEquals** to **ExamplePage.html**.
	HttpErrorCodeReturnedEquals	HTTP error codes upon which the redirection rule takes effect. The specified redirection is applied only when the error code returned equals the value specified for this parameter. For example, if you want to redirect requests to **NotFound.html** when HTTP error code 404 is returned, set **HttpErrorCodeReturnedEquals** to **404** in **Condition**, and set **ReplaceKeyWith** to **NotFound.html** in **Redirect**.
Redirect	Protocol	Protocol used for redirecting requests. The value can be **http** or **https**. If this parameter is not specified, the default value **http** is used.
	HostName	Host name to which the redirection is pointed. If this parameter is not specified, the request is redirected to the host from which the original request is initiated.
	ReplaceKeyPrefixWith	The object name prefix used in the redirection request. OBS replaces the value of **KeyPrefixEquals** with the value you specified here for **ReplaceKeyPrefixWith**. To redirect all requests for objects under docs to objects under documents, set **KeyPrefixEquals** to **docs** in **Condition** and set **ReplaceKeyPrefixWith** to **documents** in **Redirect**. This way, requests for object **docs/a.html** will be redirected to **documents/a.html**.

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Container	Key	Description
	ReplaceKeyWith	The object name used in the redirection request. OBS replaces the entire object name in the request with the value you specified here for **ReplaceKeyWith**. For example, to redirect requests for all objects in the **docs** directory to **documents/error.html**, set **KeyPrefixEquals** to **docs** under **Condition** and **ReplaceKeyWith** to **documents/error.html** under **Redirect**. This way, requests for both **docs/a.html** and **docs/b.html** will be redirected to **documents/error.html**.
	HttpRedirectCode	HTTP status code returned to the redirection request. The default value is **301**, indicating that requests are permanently redirected to the location specified by **Redirect**. You can also set this parameter based on your service needs.

Example of setting a redirection rule

- Example 1: All requests for objects prefixed with **folder1/** are automatically redirected to pages prefixed with **target.html** on host **www.example.com** using HTTPS.

```
[
   {
   "Condition": {
      "KeyPrefixEquals": "folder1/"
      },
   "Redirect":{
      "Protocol": "https",
      "HostName": "www.example.com",
      "ReplaceKeyPrefixWith": "target.html"
      }
   }
]
```

- Example 2: All requests for objects prefixed with **folder2/** are automatically redirected to objects prefixed with **folder/** in the same bucket.

```
[
   {
   "Condition": {
      "KeyPrefixEquals": "folder2/"
      },
   "Redirect":{
      "ReplaceKeyPrefixWith": "folder/"
      }
   }
]
```

- Example 3: All requests for objects prefixed with **folder.html** are automatically redirected to the **folderdeleted.html** object in the same bucket.

```
[
   {
   "Condition": {
```

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```
      "KeyPrefixEquals": "folder.html"
      },
   "Redirect":{
      "ReplaceKeyWith": "folderdeleted.html"
      }
   }
]
```

- Example 4: If the HTTP status code 404 is returned, the request is automatically redirected to the page prefixed with **report-404/** on host **www.example.com**.

  For example, if you request the page **ExamplePage.html** but the HTTP 404 error is returned, the request will be redirected to the **report-404/ExamplePage.html** page on the **www.example.com**. If the 404 redirection rule is not specified, the default 404 error page configured in the previous step is returned when the HTTP 404 error occurs.

```
[
   {
   "Condition": {
      "HttpErrorCodeReturnedEquals": "404"
      },
   "Redirect":{
      "HostName": "www.example.com",
      "ReplaceKeyPrefixWith": "report-404/"
      }
   }
]
```

Step 7 Click **OK**.

When the static website hosting is effective, you can access the static website by using the URL provided by OBS.

NOTE

In some conditions, you may need to clear the browser cache before the expected results are displayed.

----End

Using APIs

Configuring Static Website Hosting for a Bucket

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

8.6 Redirecting Requests

Redirection Overview

When using static website hosting, you can configure redirection to redirect specific or all requests.

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If the structure, address, or file name extension of a website is changed, users will fail to access the website using the old address (such as the address saved in the folder of favorites), and the 404 error message is returned. In this case, you can configure redirection for the website to redirect user access requests to a specified page rather than a 404 error page.

Typical scenarios include:

- Redirecting all requests to another website.
- Redirecting specific requests based on redirection rules.

Prerequisites

Web page files required for static website hosting have been uploaded to the specified bucket.

The static website files hosted in the bucket are accessible to all users.

Static web page files in the Archive or Deep Archive storage class have been restored. For more information, see **Restoring Archive or Deep Archive Objects**.

Procedure

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

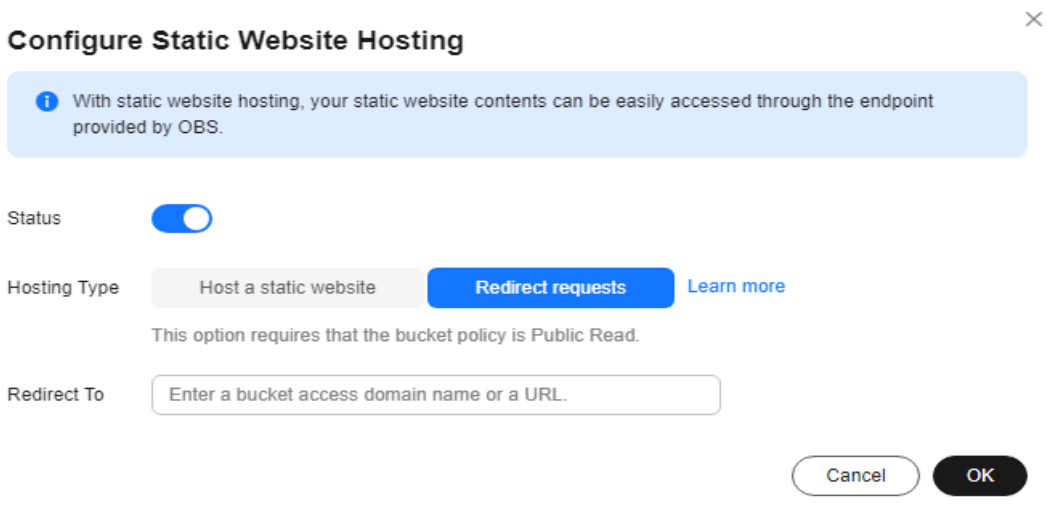
Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 Click **Configure Static Website Hosting**. The **Configure Static Website Hosting** dialog box is displayed.

Step 4 Enable **Status**.

Step 5 Set **Hosting Type** to **Redirect requests**, as shown in **Figure 8-22**. In the text box of **Redirect To**, enter the bucket's access domain name or URL.

Figure 8-22 Configuring redirection



Step 6 Click **OK**.

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Step 7 In the bucket list, click the bucket to which requests for the static website are redirected.

Step 8 (**Optional**) If the static website files in the bucket are not accessible to everyone, perform this step. If they are already accessible to everyone, skip this step.

To grant required permissions, see **Granting All Accounts Read Permission for Specified Objects**.

If the bucket contains only static website files, configure the **Object Read-Only** policy for the bucket, so that all files in it are publicly accessible.

1. Choose **Permissions** > **Bucket Policies**.
2. Click **Create**.
3. Configure bucket policy information.

Figure 8-23 Granting the Object Read-Only permission

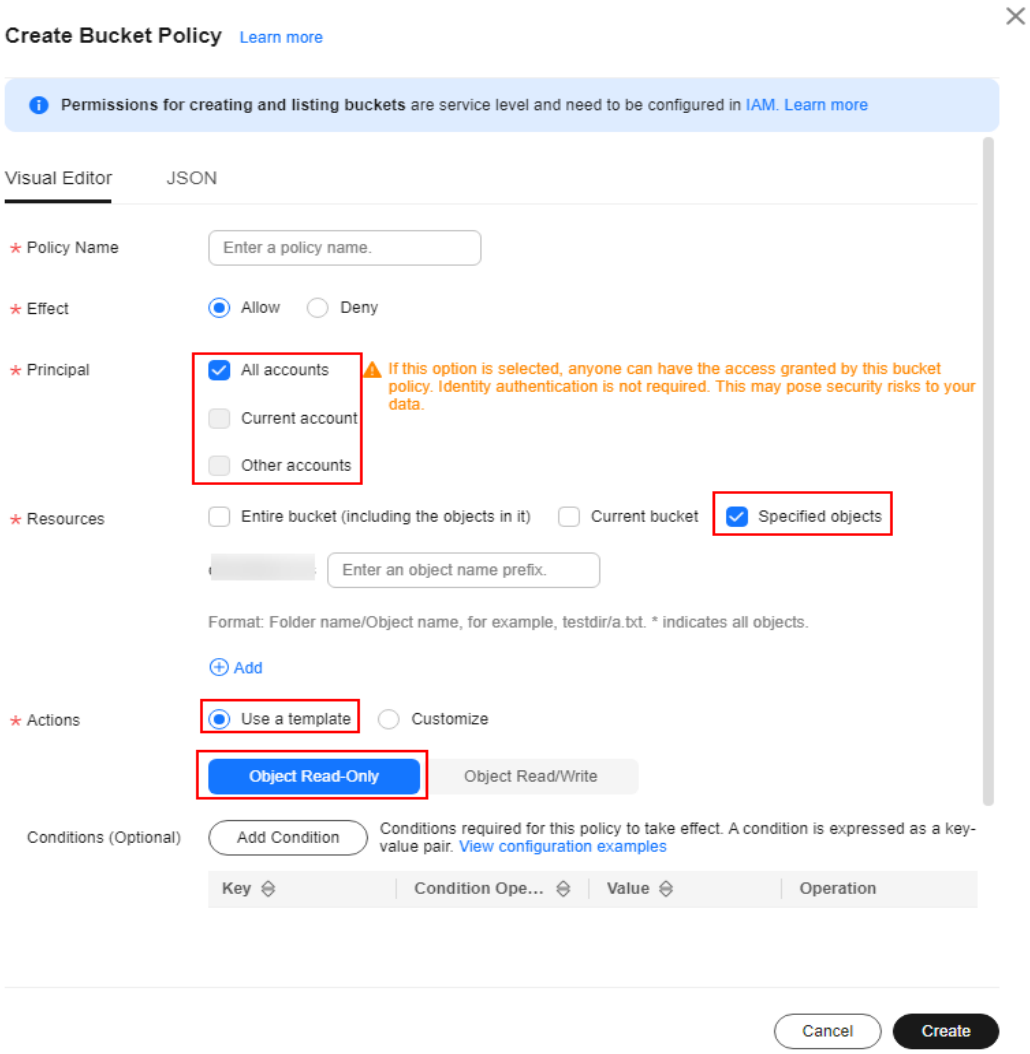

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Table 8-34 Parameters for configuring a public read policy

Parameter		Description
Configuration method		– **Visual Editor**: You can configure through a visualized interface in an easy way. – **JSON**: You can configure by coding in JSON format. The visual editor is used here. For details about configurations in the JSON view, see **Creating a Custom Bucket Policy (JSON View)**.
Policy Name		Enter a custom policy name.
Policy content	Effect	Select **Allow**.
	Principal	Select **All accounts**.
	Resources	– Select **Specified objects**. – Set the resource path to * (indicating all objects in the bucket).
	Actions	– Choose **Use a template**. – Select **Object Read-Only**.

4. Click **Create**. The bucket policy is created.

Step 9 **Verification**: Input the access domain name of the bucket in the web browser and press **Enter**. The bucket or URL to which requests are redirected will be displayed.

NOTE

In some conditions, you may need to clear the browser cache before the expected results are displayed.

----End

8.7 Data Replication

8.7.1 Data Replication Overview

Scenarios

If a fault occurs during data storage, services will be severely affected. Therefore, the DR capability is critical to data storage. You can replicate data to other buckets (in the same region or a different region) for backup and DR.

Data replication is classified into the following types: cross-region replication within an account, cross-region replication across accounts, same-region replication within an account, and same-region replication across accounts.

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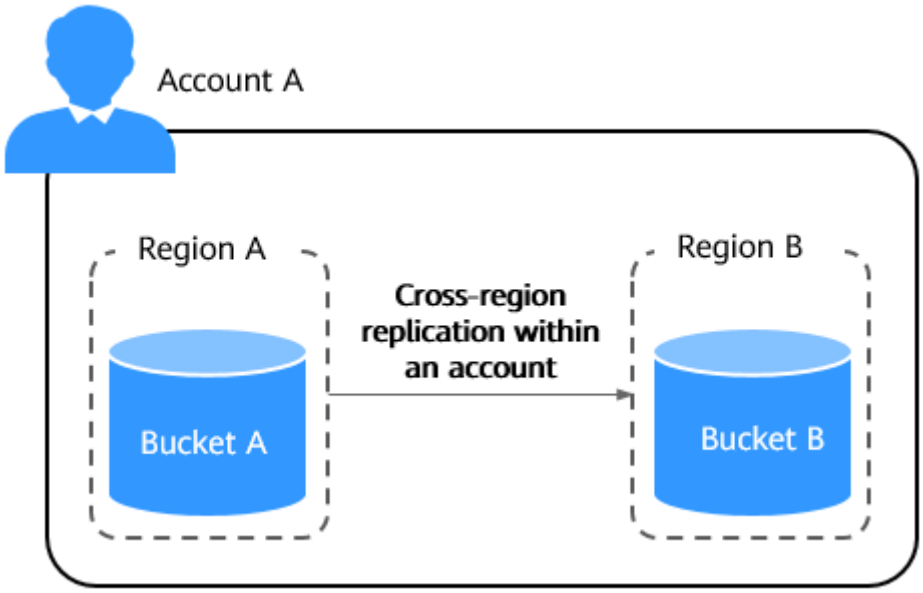
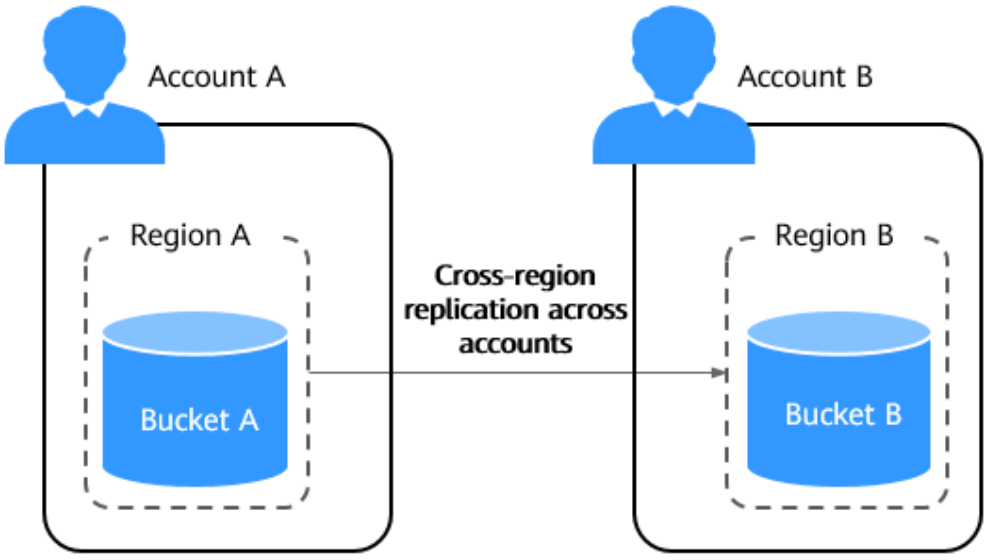
NOTE

The following source and destination buckets of data replication are Huawei Cloud OBS buckets.

- **Cross-region replication within an account**: Replicate data from bucket **A** in one region to bucket **B** in another region under the same account. For details, see **Cross-Region Replication Within an Account Using OBS**.



- **Cross-region replication across accounts**: Replicate data from bucket **A** in one region to bucket **B** in another region across accounts. For details, see **Cross-Region Replication Across Accounts Using OMS**.



- **Same-region replication within an account**: Replicate data from bucket **A** to bucket **B** within the same region under the same account. For details, see **Same-Region Replication Within an Account Using OMS**.

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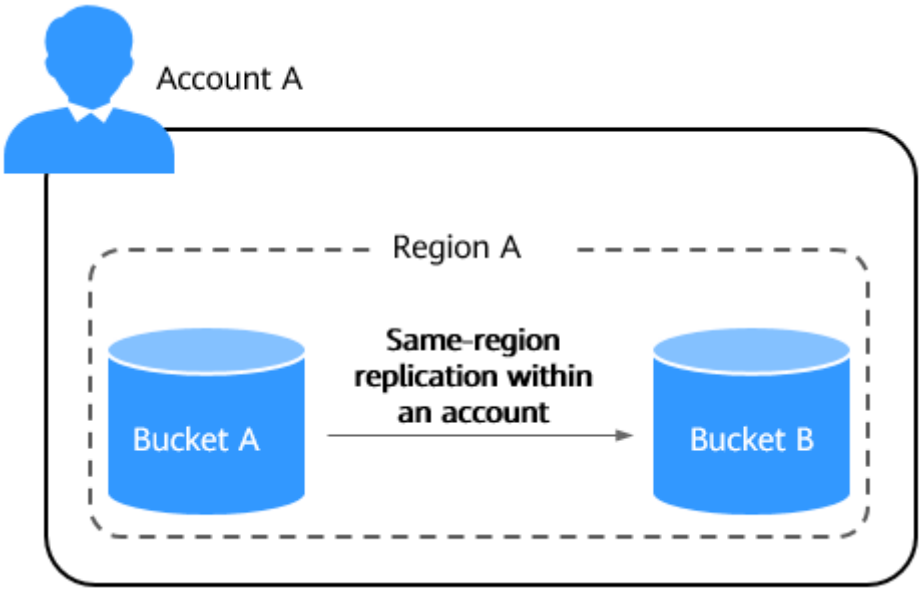
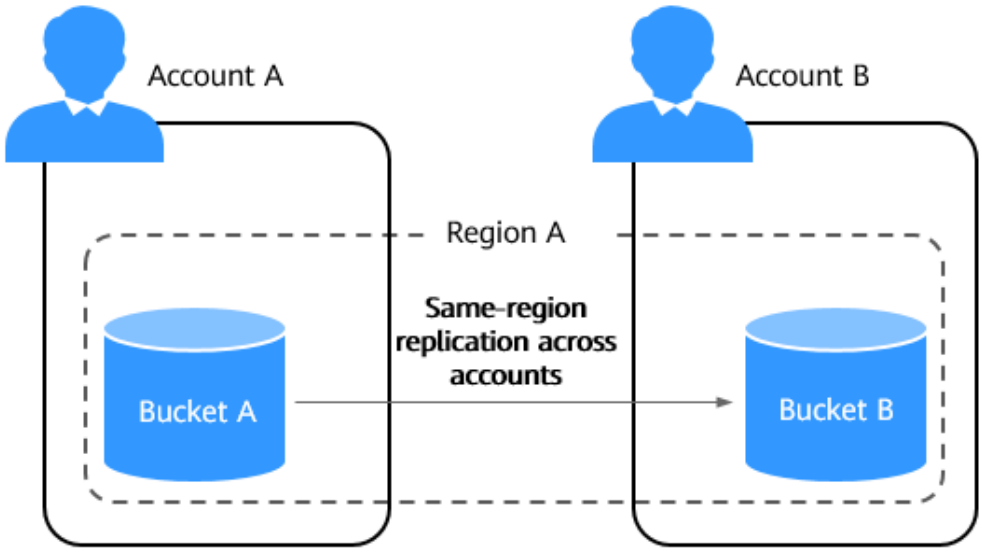


- **Same-region replication across accounts**: Replicate data from bucket **A** to bucket **B** within the same region across accounts. For details, see **Same-Region Replication Across Accounts Using OMS**.



Contents Replicated

During data replication between buckets, the data involved is often already configured with features such as versioning, lifecycle rules, server-side encryption, and WORM retention policies. The following explains how these features affect replication, specifically, which data will be replicated and which will not.

Impact of Versioning

The impact of **versioning** on data replication is as follows:

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Table 8-35 The impact of versioning on **cross-region replication within an account**

Condition	Operation	Replication Result (Using OBS Console)	Replication Result (Using OBS APIs)	Replication Result (Using obsutil)
The versioning status (disabled, enabled, or suspended) of the source bucket is the same as that of the destination bucket.	-	Data can be replicated.	Data can be replicated.	Data can be replicated.
The versioning status (disabled, enabled, or suspended) of the source bucket is different from that of the destination bucket.	-	Data cannot be replicated.	Data cannot be replicated.	Data cannot be replicated.
Cross-region replication within an account is enabled.	Chang the versioning status of the source or destination bucket.	Data cannot be replicated.	Data cannot be replicated.	Data cannot be replicated.
Versioning is enabled (or suspended) for both the source and destination buckets and cross-region replication within an account is enabled for both buckets.	Delete an object from the source bucket without specifying a version.	The object copy will be deleted synchronously from the destination bucket.		
	Delete a specified version of an object from the source bucket.	The copy of the object version will be deleted from the destination bucket.		

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Condition	Operation	Replication Result (Using OBS Console)	Replication Result (Using OBS APIs)	Replication Result (Using obsutil)
Versioning is disabled for both the source and destination buckets but cross-region replication within an account is enabled for both buckets.	Delete an object from the source bucket.	The object copy will be deleted synchronously from the destination bucket.		

CAUTION

The versioning status (enabled or disabled) of the source bucket must be the same as that of the destination bucket. Otherwise, data cannot be replicated across regions under the same account.

Table 8-36 The impact of versioning on **cross-region replication across accounts**

Condition	Operation	Replication Result (Using the OMS Console)	Replication Result (Using OMS APIs)	Replication Result (Using obsutil)
The versioning status (disabled, enabled, or suspended) of the source bucket is the same as that of the destination bucket.	Upload or modify an object.	The new object or object modification will be replicated.	The new object or object modification will be replicated.	The new object or object modification will be replicated.

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Condition	Operation	Replication Result (Using the OMS Console)	Replication Result (Using OMS APIs)	Replication Result (Using obsutil)
The versioning status (disabled, enabled, or suspended) of the source bucket is different from that of the destination bucket.	Upload or modify an object.	The new object or object modification will be replicated.	The new object or object modification will be replicated.	The new object or object modification will not be replicated.
Versioning is enabled (or suspended) for both the source and destination buckets.	Delete an object from the source bucket without specifying a version.	The object copy will not be deleted from the destination bucket.		
	Delete a specified version of an object from the source bucket.	The copy of the object version will not be deleted from the destination bucket.		
Versioning is disabled for both the source and destination buckets.	Delete an object from the source bucket.	The object copy will not be deleted from the destination bucket.	The object copy will not be deleted from the destination bucket.	The object copy will be deleted synchronously from the destination bucket.

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Table 8-37 The impact of versioning on **same-region replication** (within an account or across accounts)

Condition	Operation	Replication Result (Using the OMS Console)	Replication Result (Using OMS APIs)	Replication Result (Using OBS APIs)	Replication Result Using OBS SDKs	Replication Result (Using obsutil)
The versioning status (disabled, enabled, or suspended) of the source bucket is the same as that of the destination bucket.	Upload or modify an object.	The new object or object modification will be replicated.	The new object or object modification will be replicated.	The new object or object modification will be replicated.	The new object or object modification will be replicated.	The new object or object modification will be replicated.
The versioning status (disabled, enabled, or suspended) of the source bucket is different from that of the destination bucket.	Upload or modify an object.	The new object or object modification will be replicated.	The new object or object modification will be replicated.	The new object or object modification will not be replicated.	The new object or object modification will not be replicated.	The new object or object modification will not be replicated.
Versioning is enabled (or suspended) for both the source and destination buckets.	Delete an object from the source bucket without specifying a version.	The object copy will not be deleted from the destination bucket.	The object copy will not be deleted from the destination bucket.	The object copy will be deleted synchronously from the destination bucket.	The object copy will be deleted synchronously from the destination bucket.	The object copy will be deleted synchronously from the destination bucket.

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Condition	Operation	Replication Result (Using the OMS Console)	Replication Result (Using OMS APIs)	Replication Result (Using OBS APIs)	Replication Result Using OBS SDKs	Replication Result (Using obsutil)
	Delete a specified version of an object from the source bucket.	The copy of the object version will not be deleted from the destination bucket.	The copy of the object version will not be deleted from the destination bucket.	The copy of the object version will be deleted from the destination bucket.	The copy of the object version will be deleted from the destination bucket.	The copy of the object version will be deleted from the destination bucket.
Versioning is disabled for both the source and destination buckets.	Delete an object from the source bucket.	The object copy will not be deleted from the destination bucket.	The object copy will not be deleted from the destination bucket.	The object copy will be deleted synchronously from the destination bucket.	The object copy will be deleted synchronously from the destination bucket.	The object copy will be deleted synchronously from the destination bucket.

Impact of Lifecycle Rules

The impact of **lifecycle rules** on data replication is as follows:

If a lifecycle rule is configured for the source bucket, the rule will not be applied to the destination bucket. However, the effects of the rule will be synchronized to the destination bucket.

Impact of Server-Side Encryption

The impact of **server-side encryption** on data replication is as follows:

- If the objects in the source bucket are not encrypted and no encryption is configured for the destination bucket, the object copies in the destination bucket are not encrypted.
- If the objects in the source bucket are not encrypted but SSE-OBS is configured for the destination bucket, object copies in the destination bucket are also encrypted using SSE-OBS.
- If the objects in the source bucket are not encrypted but SSE-KMS is configured for the destination bucket using the default key or a custom key,

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the object copies in the destination bucket are encrypted in the same way as the destination bucket.

- If the objects in the source bucket are encrypted using SSE-OBS, the object copies in the destination bucket are encrypted in the same way as the objects in the source bucket, regardless of whether encryption is configured for the destination bucket.
- If the objects in the source bucket are encrypted using SSE-KMS with the default key or a custom key, the object copies in the destination bucket are encrypted in the same way as the objects in the source bucket, regardless of whether encryption is configured for the destination bucket.
- If the objects in the source bucket are encrypted using SSE-C, they cannot be replicated when you use OBS Console or OBS APIs, but can be replicated when you use OBS SDKs, obsutil, OMS console, or OMS APIs.

Impact of WORM

If a WORM retention policy is configured for a bucket and the retention period does not expire, you can upload objects to or read objects in the bucket, but cannot modify (overwrite) or delete objects in it. For details, see **Configuring WORM to Protect Objects from Being Overwritten or Deleted**.

The impact of WORM retention policies on data replication is as follows:

- If the source bucket (together with objects in it) is in the WORM retention period, whether the destination bucket is in the WORM retention period does not affect the replication operation. Newly uploaded objects will be replicated to the destination bucket, but the WORM retention policy of the source bucket will not be replicated.
- If the source bucket is not in the WORM retention period:
  - If the objects in the source bucket are in the WORM retention period, whether the destination bucket is in the WORM retention period does not affect the replication operation. Newly uploaded objects will be replicated to the destination bucket, but the WORM retention policy of the source objects will not be replicated.
  - If the objects in the source bucket are not in the WORM retention period but the destination bucket is, newly uploaded objects will be replicated to the destination bucket, but object modifications or deletions will not.
  - If the destination bucket and the objects in the source bucket are not in the WORM retention period, newly uploaded objects or object modifications will be replicated to the destination bucket; object deletions will be replicated to the destination bucket when you use OBS Console, APIs, SDKs, or obsutil, but will not be replicated when you use the OMS console or APIs.

Others

- The creation time of the object copy in the destination bucket is the creation time of the object in the source bucket, not the time when the object is replicated to the destination bucket.
- The impact of **storage classes** on data replication is as follows:
  - Objects in the Archive, or Deep Archive storage class in the source bucket can be replicated to the destination bucket only when they have been

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restored. If source objects are not restored or are being restored, the replication will fail.

- If the region where the destination bucket resides does not support storage class setting or does not support a certain storage class, the object copies are stored in the Standard storage class.

- The impact of **object ACLs** on data replication is as follows:
  - If source objects have ACLs configured, the objects and their ACLs will be replicated when you use OBS Console, APIs, SDKs, or obsutil. If you use the OMS console or APIs, the objects will be replicated but their ACLs will not.
  - If source objects have no ACLs configured, the objects will be replicated regardless of which method is used.

Data Restoration Billing

- When you use the OMS console or APIs to migrate data, OBS APIs of the source and destination ends are invoked to upload and download data. You will be billed for the API requests and data download traffic. For details, see **OMS Billing**. In addition, you will be billed for storing the objects in the destination bucket. For details, see **Storage Costs**.
- When you use OBS Console, APIs, or obsutil to replicate data across regions, you will be billed for requests, traffic, and storage. For details, see **Table 8-38**.

Table 8-38 Billing for data replication across regions

Action	Billing Item	Description	Billing Mode
Replicate data across regions	Requests	You are billed for the number of successfully replicated objects. Successfully replicating one object creates a copy request. For details, see **Copying Objects**. • For non-multipart objects, replicating an object creates a GET request to the source bucket and a PUT request to the destination bucket; deleting an object from the source bucket creates a DELETE request to the destination bucket. • For multipart objects, replicating each part creates a GET request to the source bucket and a PUT request to the destination bucket. For details about how requests are billed, see **Requests**.	Pay-per-use

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Action	Billing Item	Description	Billing Mode
	Data transfer	Traffic generated when you replicate data from the source bucket to the destination bucket in another region. Billing only applies to the **data transferred out of the source bucket**. If objects are encrypted using **server-side encryption**, the cost of their cross-region replication traffic is calculated based on the length of the plaintext for SSE-KMS and SSE-OBS.	Pay-per-use
	Storage space	Space occupied by the replicated objects in the destination bucket If you have specified another storage class for object copies in the destination bucket, these copies are billed based on the new storage class. If objects are encrypted using **server-side encryption**, their storage cost is calculated based on the length of the ciphertext.	Pay-per-use Resource packages
Synchronize existing objects	Requests	You are billed for the number of existing objects that are successfully replicated to the destination bucket. Billing applies to the number of objects that are successfully replicated. You are also billed for listing the existing objects.	Pay-per-use
	Data transfer	Traffic generated when OBS replicates existing objects to the destination bucket in another region. Billing only applies to the **data transferred out of the source bucket**. If historical objects are encrypted using **server-side encryption**, the cost of their cross-region replication traffic is calculated based on the length of the plaintext for SSE-KMS and SSE-OBS.	Pay-per-use

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Action	Billing Item	Description	Billing Mode
	Storage space	Space occupied by the replicated objects in the destination bucket If you have specified another storage class for object copies in the destination bucket, these copies are billed based on the new storage class. If historical objects are encrypted using **server-side encryption**, their storage cost is calculated based on the length of the ciphertext.	Pay-per-use Resource packages

- When you use OBS APIs, SDKs, Browser+, or obsutil to replicate data within the same region, you will be billed for requests and storage. For details, see **Table 8-39**.

Table 8-39 Billing for data replication in the same region

Action	Billing Item	Description	Billing Mode
Replicate data in the same region	Requests	You are billed for the number of successfully replicated objects. Successfully replicating one object creates a copy request. For details, see **Copying Objects**. To learn about the request billing, see **Requests**.	Pay-per-use
	Data transfer	Free, because data in the same region is replicated over an intranet.	N/A
	Storage space	Storage space occupied by objects stored in the destination bucket. If you have specified another storage class for object copies in the destination bucket, these copies are billed based on the new storage class.	Pay-per-use Resource packages

8.7.2 Cross-Region Replication Within an Account Using OBS

Scenarios

Cross-region replication within an account allows you to create a cross-region replication rule to automatically replicate data from a source bucket in one region to a destination bucket in another region under the same account in near real

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time. Objects replicated to the destination bucket are exact copies of the objects in the source bucket.

This section describes how to replicate data between buckets of the same account across regions using OBS Console, OBS APIs, and obsutil.

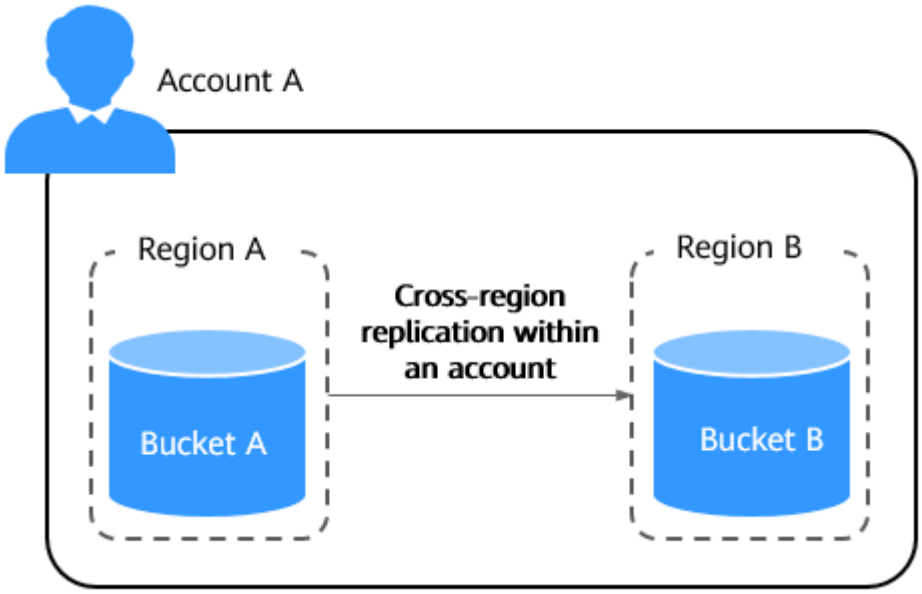
Replication scope: objects with specified prefix or all objects in the bucket

Replicable object data: object content, metadata (object name, size, last modification time, creator, version number, and user-defined metadata), ACL, and storage class (default configuration)

NOTE

If **Change storage class for replicated objects** is selected when you create a cross-region replication rule, the storage class of the object copies is different from that of the source objects.

Figure 8-24 Cross-region replication within an account



Cross-region replication within an account applies to the following scenarios:

- **Regulatory compliance**

  OBS stores data across AZs that are relatively far apart from each other, but regulatory compliance may require further distances. Cross-region replication enables you to meet regulatory requirements.

- **Low latency**

  The same OBS resources may need to be accessed from different locations. To minimize the access latency, you can use cross-region replication to create object copies in the nearest region.

- **Data replication**

  You want to migrate data stored in OBS to the data center in another region.

- **Data backup and disaster recovery**

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You want to create explicit backups for all data written to OBS in the data center of another region to ensure data remains available if there is any damage.

- **Ease of maintenance**

  You have compute clusters used to analyze the same group of objects in two different OBS regions and may need to maintain object copies in these two regions.

NOTICE

OBS helps you replicate your service data stored in OBS to a specified region, but Huawei Cloud has no access to your data. You need to ensure the legal compliance of your use of OBS on your own. If your replication involves cross-border transfer, ensure that your use complies with relevant laws and regulations.

Constraints

Table 8-40 Constraints on cross-region replication within an account

Item	Description
Bucket version	Only buckets whose version is 3.0 or later support cross-region replication. The version of a bucket can be viewed in the **Basic Information** area of the bucket's **Overview** page on OBS Console. For details, see **Viewing Bucket Information**.
Functions	• If objects in the source bucket are in the Archive, or Deep Archive storage class, they cannot be replicated to the destination bucket. • If the destination region does not support a specific storage class, object copies will be stored in the Standard storage class. • OBS currently only supports the replication between one source bucket and one destination bucket. Replication from one source bucket to multiple destination buckets is not supported. The destination bucket can be modified. However, modifying the destination bucket will change the destination bucket of all existing rules. • Cross-region replication does not replicate appendable objects. • A source bucket can have only one cross-region replication rule that is applied to all objects in the bucket, or it can have up to 100 rules that are applied to objects with the specified prefix. • Objects encrypted using SSE-C cannot be replicated across regions.

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Item	Description
Time	A cross-region replication rule may not take effect immediately upon its configuration. Accordingly, the objects that this rule is applied to may not be replicated immediately after the rule is configured.
Area	• The source and destination buckets must be in two different regions. • Before replicating data, ensure that the source and destination regions can have their data replicated from each other. **Figure 8-25** lists the supported regions. "√" indicates that data can be replicated between regions. "x" indicates that data cannot be replicated between regions.
Synchronization of historical objects	• By default, objects uploaded before cross-region replication is enabled are not replicated to the destination bucket unless the function for synchronizing existing objects is enabled. • Modifying cross-region replication settings may prevent existing objects from being replicated, so do not make modifications before the synchronization of existing objects is complete. • If a copied object in the destination bucket is deleted and a new replication rule that allows replication of existing objects is configured within three days of the deletion, the same version of the deleted object will not be replicated to the destination bucket again. For example, you first configure cross-region replication rule **1** to replicate the current version of object **test.txt** from the source bucket to the destination bucket. Later, you delete **test.txt** from the destination bucket and delete rule **1**. Two days afterward, you create cross-region replication rule **2** that allows replication of existing objects. In this case, **test.txt** will not be replicated to the destination bucket again.
Versioning	• The versioning status (enabled or disabled) of the source bucket must be the same as that of the destination bucket. • If versioning is enabled or suspended for both the source and destination buckets and cross-region replication is also enabled for both buckets, deleting an object without specifying its version in the source bucket will also delete the object in the destination bucket. • For an enabled cross-region replication rule, if you change the versioning status of the destination bucket, the replication of objects will fail. If you want to change the versioning status of the source bucket, delete the replication configuration first, and then make the change.

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Item	Description
Access control	• Bucket owners must have the read and write permissions for both source and destination buckets for successful replication. If OBS does not have permission to read source objects or write destination objects, objects cannot be replicated successfully. Even if OBS is granted required permissions later, the replication will not be resumed. • Do not delete or overwrite object copies in a destination bucket or modify their ACLs. Doing so may result in inconsistent latest object versions and access control settings between the destination and source buckets. • After a replication with **Synchronize Existing Objects** enabled is complete, if the replication policy keeps unchanged, any ACL changes of source objects will be synchronized to object copies. However, ACL changes of source historical objects will not be synchronized to the copies of historical objects.
Tags	A cross-region replication rule will not replicate tags applied to the source bucket and objects to the destination bucket and objects.
Others	• Objects in a source bucket can be replicated to only one destination bucket, and cannot be replicated further from that destination bucket to another bucket. For example, bucket A and bucket B are in two different regions. You can copy data from bucket A to bucket B or the other way round. However, data copies in either bucket A or bucket B cannot be replicated anymore. • If you delete the OBS agency for an enabled cross-region replication rule, the object replication will be in the **FAILED** status. • If **BlockPublicAcls** is enabled for the destination bucket but the ACL of source bucket allows public access, cross-region replication will fail because of ACL conflicts.

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Figure 8-25 Replication between regions

Source Region \ Destination Region	CN North-Beijing4	CN East-Shanghai1	CN East-Shanghai2	CN North-Beijing2	CN North-Ulanqab1	CN Southwest-Guiyang1	CN South-Guangzhou	CN-Hong Kong	AP-Bangkok	LA-Sao Paulo1	AF-Johannesburg	LA-Mexico City1	LA-Mexico City2	AP-Singapore	AP-Jakarta	TR-Istanbul	CN South-Shenzhen	CN South-Guangzhou-InvitationOnly	LA-Santiago	CN East-Qingdao	ME-Riyadh	CN East 2
CN North-Beijing4	-	√	√	√	√	√	√	√	x	x	x	x	x	√	√	√	√	x	x	√	x	√
CN East-Shanghai1	√	-	√	x	√	√	√	√	x	√	√	x	√	√	√	√	√	x	x	x	x	√
CN East-Shanghai2	√	√	-	√	√	√	√	x	x	x	√	x	x	x	x	x	x	x	x	x	x	x
CN North-Beijing2	√	x	√	-	√	√	√	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
CN North-Ulanqab1	√	√	√	√	-	√	√	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
CN Southwest-Guiyang1	√	√	√	√	√	-	√	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√
CN South-Guangzhou	√	√	√	√	√	√	-	√	x	x	√	x	x	√	x	x	√	x	x	x	x	√
CN-Hong Kong	√	√	x	x	x	x	√	-	√	x	x	x	x	√	x	x	x	x	x	x	x	x
AP-Bangkok	x	x	x	x	x	x	x	√	-	x	x	x	x	√	x	x	x	x	x	x	x	√
LA-Sao Paulo1	√	√	x	x	x	x	x	x	x	-	x	x	x	√	x	x	x	x	x	x	x	x
AF-Johannesburg	x	x	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x	x	x	x	x	x
LA-Mexico City1	x	x	x	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x	x	x	x	x
LA-Mexico City2	x	√	x	x	x	x	√	x	x	x	x	x	-	√	x	x	x	x	√	x	x	x
AP-Singapore	√	√	x	x	x	x	√	√	√	√	√	x	x	-	√	√	x	x	√	x	√	x
AP-Jakarta	√	√	x	x	x	x	x	x	x	x	x	x	x	√	-	x	x	x	x	x	x	x
TR-Istanbul	√	√	x	x	x	x	x	x	x	x	x	x	x	√	x	-	x	x	x	x	x	x
CN South-Shenzhen	√	√	x	x	x	√	√	x	x	x	x	x	x	x	x	x	-	√	x	x	x	x
CN South-Guangzhou-InvitationOnly	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	√	-	x	x	x	x
LA-Santiago	x	√	x	x	x	x	x	x	x	√	x	x	x	√	x	x	x	x	-	x	x	√
CN East-Qingdao	√	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	x	x
ME-Riyadh	x	x	x	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	x	x	-	x
CN East 2	√	√	x	x	√	√	√	x	√	x	√	x	√	√	x	x	x	x	√	x	x	-

Important Notes

- After a bucket is created, you are advised to wait at least 5 minutes before creating a cross-region replication rule for the bucket, or the rule may fail to be created.
- If the cross-region replication rule is enabled but the function of synchronizing existing objects is disabled, there is a delay of about five minutes to apply the rule. Objects uploaded during that delay may not be replicated.
- If the cross-region replication rule and the function of synchronizing existing objects are both enabled, existing objects will be replicated 5 minutes later.
- Objects encrypted using **server-side encryption** (including SSE-KMS and SSE-OBS) can be replicated. The replication traffic cost is calculated based on the length of the plaintext for SSE-KMS and SSE-OBS. For details, see **Billing for Cross-Region Replication Within an Account**.

Billing for Cross-Region Replication Within an Account

Figure 8-26 shows the items that will be billed when data is replicated from one region to another.

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Figure 8-26 Items billed for cross-region replication

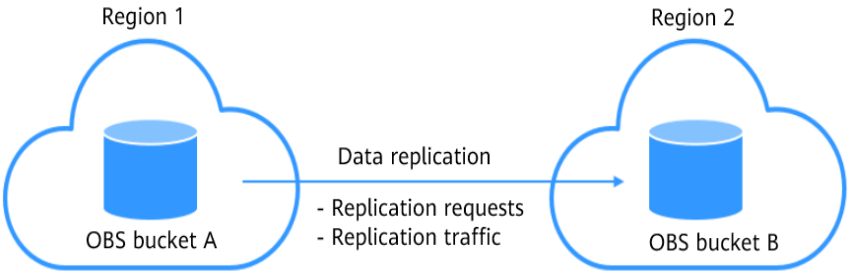

Table 8-41 Billing for data replication across regions

Action	Billing Item	Description	Billing Mode
Replicate data across regions	Requests	You are billed for the number of successfully replicated objects. Successfully replicating one object creates a copy request. For details, see **Copying Objects**. • For non-multipart objects, replicating an object creates a GET request to the source bucket and a PUT request to the destination bucket; deleting an object from the source bucket creates a DELETE request to the destination bucket. • For multipart objects, replicating each part creates a GET request to the source bucket and a PUT request to the destination bucket. For details about how requests are billed, see **Requests**.	Pay-per-use
	Data transfer	Traffic generated when you replicate data from the source bucket to the destination bucket in another region. Billing only applies to the **data transferred out of the source bucket**. If objects are encrypted using **server-side encryption**, the cost of their cross-region replication traffic is calculated based on the length of the plaintext for SSE-KMS and SSE-OBS.	Pay-per-use
	Storage space	Space occupied by the replicated objects in the destination bucket If you have specified another storage class for object copies in the destination bucket, these copies are billed based on the new storage class. If objects are encrypted using **server-side encryption**, their storage cost is calculated based on the length of the ciphertext.	Pay-per-use Resource packages

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Action	Billing Item	Description	Billing Mode
Synchronize existing objects	Requests	You are billed for the number of existing objects that are successfully replicated to the destination bucket. Billing applies to the number of objects that are successfully replicated. You are also billed for listing the existing objects.	Pay-per-use
	Data transfer	Traffic generated when OBS replicates existing objects to the destination bucket in another region. Billing only applies to the **data transferred out of the source bucket**. If historical objects are encrypted using **server-side encryption**, the cost of their cross-region replication traffic is calculated based on the length of the plaintext for SSE-KMS and SSE-OBS.	Pay-per-use
	Storage space	Space occupied by the replicated objects in the destination bucket If you have specified another storage class for object copies in the destination bucket, these copies are billed based on the new storage class. If historical objects are encrypted using **server-side encryption**, their storage cost is calculated based on the length of the ciphertext.	Pay-per-use Resource packages

Prerequisites

- A source bucket has been created in a region of an account. The version of the source bucket is 3.0 or later, and cross-region replication is available in the region of the source bucket.
- A destination bucket has been created in another region of the same account. To create a bucket, see **Creating a Bucket**.

Creating a Rule for Cross-Region Replication Within an Account

You can use **OBS Console**, APIs, or obsutil to configure cross-region replication within an account.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Data Management** > **Cross-Region Replication**.

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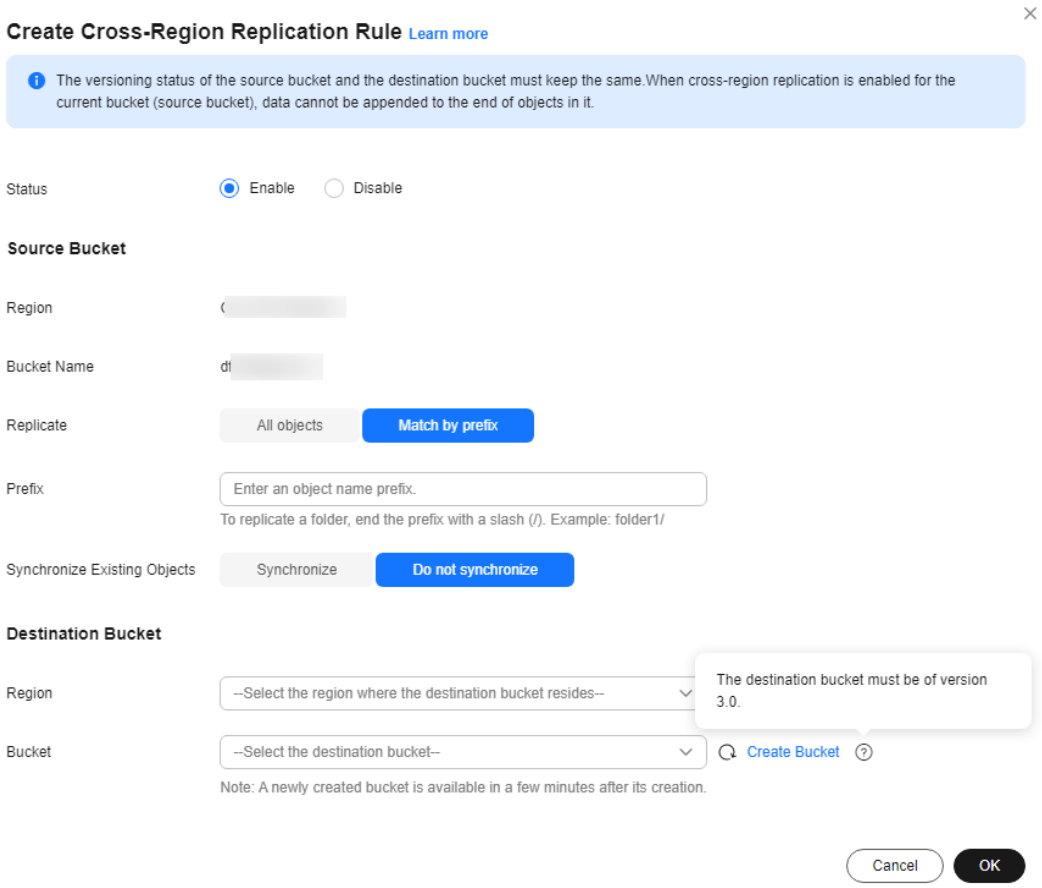
Step 4 Click **Create Rule**. The **Create Cross-Region Replication Rule** dialog box is displayed. See **Figure 8-27**.

Figure 8-27 Creating a cross-region replication rule



NOTE

- The source and destination buckets must have the same versioning status.
- A bucket can have only one destination bucket and one IAM agency configured for cross-region replication. The destination bucket and IAM agency specified in a later replication rule will overwrite those in the previous replication rule of the bucket.

Step 5 Configure a cross-region replication rule according to your needs.

Table 8-42 Cross-region replication parameters

Parameter	Description
Status	Indicates whether the rule is enabled or disabled after being created. The source and destination buckets must have the same versioning status.

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Parameter		Description
Source Bucket	Replicate	Indicates the objects the rule will apply to. • **All objects**: The rule applies to all objects in the bucket. • **Match by prefix**: The rule applies only to objects with the specified prefix.
	Prefix	If you select **Match by prefix** for **Replicate**, you need to specify an object name prefix. The rule will apply only to objects with the specified prefix in the source bucket. • You must set **Prefix** to a value no longer than 1,024 characters. • If the specified prefix overlaps with the prefix of an existing rule, OBS regards these two rules as one and forbids you to configure the one you are configuring. For example, if there is already a rule with prefix **abc** in OBS, you cannot configure another rule whose prefix starts with **abc**. • To copy a folder, end the prefix with a slash (/), for example, **folder1/**.
	Synchronize Existing Objects	Indicates whether to synchronize the objects that were already in the source bucket before the rule configuration to the destination bucket. By default, these objects are not synchronized.
Destination Bucket	Region	Indicates the region of the destination bucket. The destination and source buckets must be in different regions.
	Bucket	Indicates the destination bucket. **NOTE** If a bucket is newly created, you may need to wait for several minutes before you can view the bucket in the drop-down list of the destination bucket.
	Change storage class for replicated objects	Changes the storage class of objects replicated from the source bucket to the destination bucket. • By default, this option is not selected, indicating that the storage class of object copies is the same as that of the source objects. • If you need to change the storage class of object copies, select this parameter, then you can specify a storage class.

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Parameter		Description
Permissions	Replicate KMS encrypted objects	Replicates KMS encrypted objects from the source bucket to the destination bucket. OBS will try to copy KMS encrypted objects no matter whether this option is selected or not. • If this option is selected, only the IAM agencies that have any permission for the global project and have the **KMS Administrator** permission for both source and destination regions are displayed in the drop-down list of **IAM Agency** in the **Create Cross-Region Replication Rule** dialog box. • If this option is not selected, only the IAM agencies that have any permission for the global project, but do not have the **KMS Administrator** permission for either the source or destination region are displayed in the drop-down list of **IAM Agency** in the **Create Cross-Region Replication Rule** dialog box. If KMS is not available in the destination region or the agency does not have the **KMS Administrator** permission in the source and destination regions, KMS encrypted objects will fail to be replicated to the destination bucket, and the object replication status will be failed. After a KMS-encrypted object is replicated to the destination bucket, the key for encrypting the object copy changes to the default key **obs/default** of the destination region.
	IAM Agency	Delegates OBS to operate your resources, so that OBS can use this agency to implement cross-region replication. If there is no IAM agency available, click **View IAM Agencies** to create one. If you have already created IAM agencies, select one from the drop-down list. The IAM agency must meet the following requirements: • The IAM agency must be for OBS and the OBS project must have the **Tenant Administrator** permission. • If **Replicate KMS encrypted objects** is selected, the agency must have the **KMS Administrator** permission. The authorization scope of the agency must be set to **Region-specific projects**, and the source and destination regions must be selected.

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Step 6 (Optional) Create an IAM agency. For details, see **Creating an Agency for Cross-Region Replication**.

Step 7 Click **OK**. The cross-region replication rule is created.

----End

Using OBS APIs

Configuring Cross-Region Replication for a Bucket

Using the OBS CLI Tool - obsutil

To use obsutil to replicate objects across regions within an account, you must enable the cross-region replication mode, which means that the **crr** parameter is mandatory.

NOTICE

- Do not change the source objects in the OBS bucket when copying a single object or objects in batches. Otherwise, the operation may fail or data may be inconsistent.
- If the storage class of the object to be copied is **cold**, you must restore the object to be copied first. Otherwise, the copy fails.
- To copy objects, you must have the read permission on the objects to be copied and the write permission on the destination bucket.
- If the client-side cross-region replication function is not enabled, ensure that the source bucket and destination bucket are in the same region.
- If the source bucket is a parallel file system (supporting POSIX), the destination bucket must also be a parallel file system.

Constraints

- The source path and destination path cannot be the same.
- The source path and destination path cannot be overlapped either.
  - If the source path overlaps with the prefix of the destination path, recursive replication applies.
  - If the destination path overlaps with the prefix of the source path, the replication may overwrite objects in the source path.

Command Line Structure

- In Windows
  - Copying a single object

    ```
    obsutil cp obs://srcbucket/key obs://dstbucket/[dest] [-dryRun][-u] [-crr] [-vlength] [-vmd5] [-p=1] [-threshold=52428800] [-versionId=xxx] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

  - Copying objects in batches

    ```
    obsutil cp obs://srcbucket[/key] obs://dstbucket[/dest] -r [-dryRun][-f] [-flat] [-u] [-crr] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

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- In Linux or macOS
  - Copying a single object
    ```
    ./obsutil cp obs://srcbucket/key obs://dstbucket/[dest] [-dryRun] [-u] [-crr] [-vlength] [-vmd5] [-p=1] [-threshold=52428800] [-versionId=xxx] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Copying objects in batches
    ```
    ./obsutil cp obs://srcbucket[/key] obs://dstbucket[/dest] -r [-dryRun] [-f] [-flat] [-u] [-crr] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

Examples

- Take the Windows OS as an example. Run the **obsutil cp obs://bucket-test/key obs://bucket-test2** command to copy a single object.
  ```
  obsutil cp obs://bucket-test/key obs://bucket-test2
  Start at 2024-09-30 08:30:09.0815415 +0000 UTC

  Parallel:      3                Jobs:          3
  Threshold:     50.00MB          PartSize:      auto
  CheckpointDir: xxxx

  [=================================================] 100.00% 6/s 0s
  Waiting for the copied key to be completed on server side.
  Copy successfully, 19B, obs://bucket-test/key --> obs://bucket-test2/key
  ext.txt, cost [1708], status [200], request id [00000192420D227E4017336A12F1DC22]
  ```
- Take the Windows OS as an example. Run the **obsutil cp obs://bucket-test/temp/ obs://bucket-test2 -f -r** command to copy objects in batches.
  ```
  obsutil cp obs://bucket-test/temp/ obs://bucket-test2 -r -f
  Start at 2024-09-30 08:34:02.7819703 +0000 UTC

  Parallel:      5                Jobs:          5
  Threshold:     50.00MB          PartSize:      auto
  CheckpointDir: xxxx

  Task id: 0476929d-9d23-4dc5-b2f8-0a0493f027c5
  OutputDir: xxxx

  [=========================================================] 100.00% 10/s 0s
  Succeed count:   5        Failed count:    0
  Metrics [max cost:298 ms, min cost:192 ms, average cost:238.00 ms, average tps:9.71, transferred size: 7.20MB]
  Task id: 0476929d-9d23-4dc5-b2f8-0a0493f027c5
  ```
- For more examples, see **Common Examples**.

Parameter Description

Parameter	Optional or Mandatory	Description
srcbucket	Mandatory	The source bucket name
dstbucket	Mandatory	The destination bucket name
dest	Optional	The destination object name when copying an object, or the name prefix of destination objects when copying objects in batches

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Parameter	Optional or Mandatory	Description
key	Mandatory for copying an object. Optional for copying objects in batches.	The source object name when copying an object, or the name prefix of source objects when copying objects in batches The rules are as follows: • This parameter cannot be left blank when copying an object. – If **dest** is left blank, the source object is copied to the root directory of the destination bucket. – If the value of **dest** ends with a slash (/), the destination object name is the value of **dest** plus the source object name. Otherwise, the destination object name is the value of **dest**. • If this parameter is left blank when copying objects in batches, all objects in the source bucket are copied. If not, objects whose name prefix is the set value in the source bucket are copied. The rules for confirming the name of the destination object are as follows: – If the value of **dest** ends with a slash (/), the destination object name is the value of **dest** plus the source object name. – If the value of **dest** does not end with a slash (/), the destination object name is *the value of **dest**/source object name*. • If this parameter is configured but the **flat** parameter is not when copying objects in batches, the name of the source object contains the name prefix of the parent object. If **flat** is configured, then the name of the source object does not contain the name prefix of the parent object. **NOTE** For details about how to use this parameter, see **Copy**.
fr	Optional for copying an object (additional parameter)	Generates an operation result file when copying an object.
flat	Optional for copying objects in batches (additional parameter)	The name prefix of the parent object is excluded when copying objects in batches.

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Parameter	Optional or Mandatory	Description
dryRun	Optional (additional parameter)	Conducts a dry run.
crr	Mandatory for cross-region replication within an account	Enables the client-side cross-region replication function. In this mode, data is directly copied to the destination bucket from the source bucket through data stream. The buckets can be any two OBS buckets. • If this parameter is configured, the configuration of client-side cross-region replication must be updated in the configuration file. For details, see **Updating a Configuration File**. • When cross-region replication is enabled, the upload/download bandwidth, CPU, and memory resources of the host where commands are executed will be occupied, which may deteriorate the host performance. **NOTE** The configurations of the source bucket and destination bucket are respectively **akCrr/skCrr/tokenCrr/endpointCrr** and **ak/sk/token/endpoint** in the configuration file.
vlength	Optional (additional parameter)	Verifies whether the object size in the destination bucket is the same as that in the source bucket after the copy task completes. **This parameter must be used together with crr.**
vmd5	Optional (additional parameter)	Verifies whether the MD5 value of the destination bucket is the same as that of the source bucket after the copy task completes. • **This parameter must be used together with crr.** • **Objects in the source bucket must contain metadata x-obs-meta-md5chksum, or MD5 verification will be skipped.** After the MD5 verification is successful, this parameter value is used for metadata **x-obs-meta-md5chksum** of the destination object, for later MD5 verification during download or replication. • **If your object needs encryption, do not use this parameter.**

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Parameter	Optional or Mandatory	Description
u	Optional (additional parameter)	Indicates incremental copy. If this parameter is set, each object can be copied only when it does not exist in the destination bucket, its size is different from the namesake one in the destination bucket, or it has the latest modification time.
p	Optional (additional parameter)	The maximum number of concurrent multipart copy tasks when copying an object. The default value is the value of **defaultParallels** in the configuration file.
threshold	Optional (additional parameter)	The threshold for enabling multipart copy. If the size of the object to be copied is smaller than the threshold, copy the object directly. If not, a multipart copy is required. The default value is the value of **defaultBigfileThreshold** in the configuration file. Unit: byte This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes). **NOTE** If you copy an object directly, no part record is generated, and resumable transmission is not supported.
versionId	Optional for copying an object (additional parameter)	The source object version ID that can be specified when copying an object
acl	Optional (additional parameter)	The access control policies for destination objects that can be specified when copying objects. Possible values are: • **private**: Only users granted permissions by the object ACL can access the object. • **public-read**: Anyone can read objects in the bucket. • **public-read-write**: Anyone can read, write, or delete objects in the bucket. • **bucket-owner-full-control**: Only the bucket owner has full control over objects in the bucket.

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Parameter	Optional or Mandatory	Description
sc	Optional (additional parameter)	The storage classes of the destination objects that can be specified when copying objects. Possible values are: • **standard**: The Standard storage class. It features low access latency and high throughput, and is suitable for storing frequently accessed data (multiple times per month on average) or data that is smaller than 1 MB. • **warm**: The Infrequent Access storage class. It is suitable for storing infrequently accessed (less than 12 times per year on average) data, but when needed, the access has to be fast. It has a slightly lower availability than Standard. • **cold**: The Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once per year on average) data. • **deep-archive**: The Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely accessed (once every few years on average). This storage class costs less than the Archive storage class, but takes longer (usually several hours) to restore data.
meta	Optional (additional parameter)	The standard or user-defined metadata that can be specified during object replication. • Standard metadata includes **Content-Type**, **Content-Encoding**, **Cache-Control**, **Content-Disposition**, **Content-Language** and **Expires**. • User-defined metadata must be in the format of *key:value*. Multiple user-defined metadata items are separated by number signs (#), for example, *key1:value1*#*key2:value2*#*key3:value3*, which indicates that the object copy in the destination bucket contains three groups of user-defined metadata: *key1:value1*, *key2:value2*, and *key3:value3*.

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Parameter	Optional or Mandatory	Description
fs	Optional (additional parameter)	Specifies whether the method of listing parallel file systems is applied. If you are listing parallel file systems, you are recommended to add this parameter. ● After this parameter is enabled, **marker** and **limit** will be ignored. Then, the size of the bucket, parallel file system, or directory will be calculated. ● This parameter is only supported for obsutil 5.5.12 or later. ● With this method, the listing time required varies largely depending on the directory structures.
ps	Optional (additional parameter)	The size of each part in a multipart copy task ● The default value is the value of **defaultPartSize** in the configuration file. The parameter can be set to **auto**. In this case, obsutil automatically configures the part size for each multipart task based on the source file size. ● Range: **100KB** to **5GB** ● Unit: byte. This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes).
cpd	Optional (additional parameter)	The folder where the part records reside. The default value is **.obsutil_checkpoint**, the subfolder in the home directory of the user who executes obsutil commands. A part record is generated during a multipart copy and saved to the **upload** subfolder. After the copy succeeds, its part record is deleted automatically. If the copy fails or is suspended, the system attempts to resume the task according to its part record when you perform the copy the next time.
r	Mandatory for copying objects in batches (additional parameter)	Copies objects in batches based on a specified name prefix of objects in the source bucket.

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Parameter	Optional or Mandatory	Description
f	Optional for copying objects in batches (additional parameter)	Runs in force mode.
j	Optional for copying objects in batches (additional parameter)	The maximum number of concurrent tasks for copying objects in batches. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.

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Parameter	Optional or Mandatory	Description
exclude	Optional for copying objects in batches (additional parameter)	The matching patterns of source objects that are excluded. After this parameter is specified, if the name of the object to be copied matches the value of this parameter, the object is skipped. For example, if this parameter is set to ***.txt**, all files whose names end with **.txt** are skipped and not copied. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent ***** and **\?** to represent **?**. ● Multiple **exclude** parameters can be specified, for example, **-exclude=*.xxx -exclude=*.xxx**. **Restrictions**: This matching pattern applies only to objects whose names do not end with a slash (/). **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute path of an object, including the object name prefix and object name starting from the root directory. For example, if the path of an object in the bucket is **obs://bucket/src1/src2/test.txt**, then the absolute path of the object is **src1/src2/test.txt**.

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Parameter	Optional or Mandatory	Description
include	Optional for copying objects in batches (additional parameter)	The included matching patterns of source objects. After this parameter is specified, if the name of the object to be copied matches the value of this parameter, the object is copied. For example, if this parameter is set to ***.txt**, all objects whose names end with **.txt** are copied. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent ***** and **\?** to represent **?**. ● Multiple **include** parameters can be specified, for example, **-include=*.xxx -include=*.xxx**. **Restrictions**: ● This matching pattern applies only to objects whose names do not end with a slash (/). ● If both the **exclude** and **include** parameters are configured, the **exclude** rules are applied first. If the name of an object to be copied does not match **exclude**, OBS checks whether the object name matches the value of **include**. If yes, the object is copied. If no, the object is skipped. **Example**: `./obsutil cp obs://src-bucket/ obs://target-bucket/ -include=/src-object/* -f -r` This command copies files whose names start with **src-object/** from the **src-bucket** bucket to the **target-bucket** bucket. **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute path of an object, including the object name prefix and object name starting from the root directory. For example, if the path of an object in the bucket is **obs://bucket/src1/src2/test.txt**, then the absolute path of the object is **src1/src2/test.txt**.

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Parameter	Optional or Mandatory	Description
timeRange	Optional for copying objects in batches (additional parameter)	The time range matching pattern when copying objects. Only objects whose latest modification time is within the configured time range are copied. This pattern has a lower priority than the file matching patterns (**exclude**/**include**). That is, the time range matching pattern is executed after the configured file matching patterns. ● Time in the matching pattern is the UTC time. ● The matching time range is represented in *time1*-*time2*, where *time1* must be earlier than or the same as *time2*. The time format is *yyyyMMddHHmmss*. ● Automatic formatting is supported. For example, *yyyyMMdd* is equivalent to *yyyyMMdd***000000**, and *yyyyMM* is equivalent to *yyyyMM***01000000**. ● If this parameter is set to ***-***time2*, all files whose last modification time is earlier than *time2* are matched. If it is set to *time1*-*, all files whose last modification time is later than *time1* are matched. **This matching pattern applies only to objects whose names do not end with a slash (/).**
mf	Optional (additional parameter)	Indicates that the name matching pattern (**include** or **exclude**) and the time matching pattern (**timeRange**) also take effect on objects whose names end with a slash (/).

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Parameter	Optional or Mandatory	Description
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (possibly success, failure, and warning files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. • A result file should be named as follows: **cp_{succeed | failed | warning}_report**_*time*_*TaskId*.**txt**. • By default, the maximum size of a single result file is 30 MB. You can set the maximum size by configuring **recordMaxLogSize** in the configuration file. • By default, the maximum number of result files that can be retained is 1,024. You can set the maximum number by configuring **recordBackups** in the configuration file. • If there are multiple folders and files and you need to confirm the details of a failed task, refer to the failure result file **cp_failed_report**_*time*_*TaskId*.**txt** in the result folder and the **log files** in the log path.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. To learn the parameters that can be configured in this file, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Response

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Field	Description
Parallel	The parameter **-p** in the request
Jobs	The parameter **-j** in the request
Threshold	The parameter **-threshold** in the request
PartSize	The parameter **-ps** in the request
Exclude	The parameter **-exclude** in the request
Include	The parameter **-include** in the request
TimeRange	The parameter **-timeRange** in the request
VerifyLength	The parameter **-vlength** in the request
VerifyMd5	The parameter **-vmd5** in the request
CheckpointDir	The parameter **-cpd** in the request
OutputDir	The parameter **-o** in the request
ArcDir	The parameter **-arcDir** in the request
Succeed count	The number of successful tasks
Failed count	The number of failed tasks
Skip count	The number of tasks that are skipped during incremental upload, download, or copy, and synchronous upload, download, or copy. **NOTE** Skipped tasks are recorded into successful tasks.
Warning count	The number of tasks that are executed successfully but contain warnings. **NOTE** • The task for which a warning is generated may be a failure or a success, which needs to be further determined according to the corresponding result list. • The number of tasks that generate warnings is independent of the number of successful or failed tasks. The total number of tasks is the number of successful tasks plus the number of failed tasks.
Succeed bytes	The number of bytes that are successfully uploaded or downloaded.
max cost	The maximum duration of all tasks, in ms
min cost	The minimum duration of all tasks, in ms
average cost	The average duration of all tasks, in ms
average tps	The average number of tasks completed per second
Task id	The unique ID of an operation, which is used to search for the result file generated for a batch task

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Modifying, Disabling, Enabling, or Deleting a Cross-Region Replication Rule

You can use **OBS Console** or APIs to manage cross-region replication rules.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

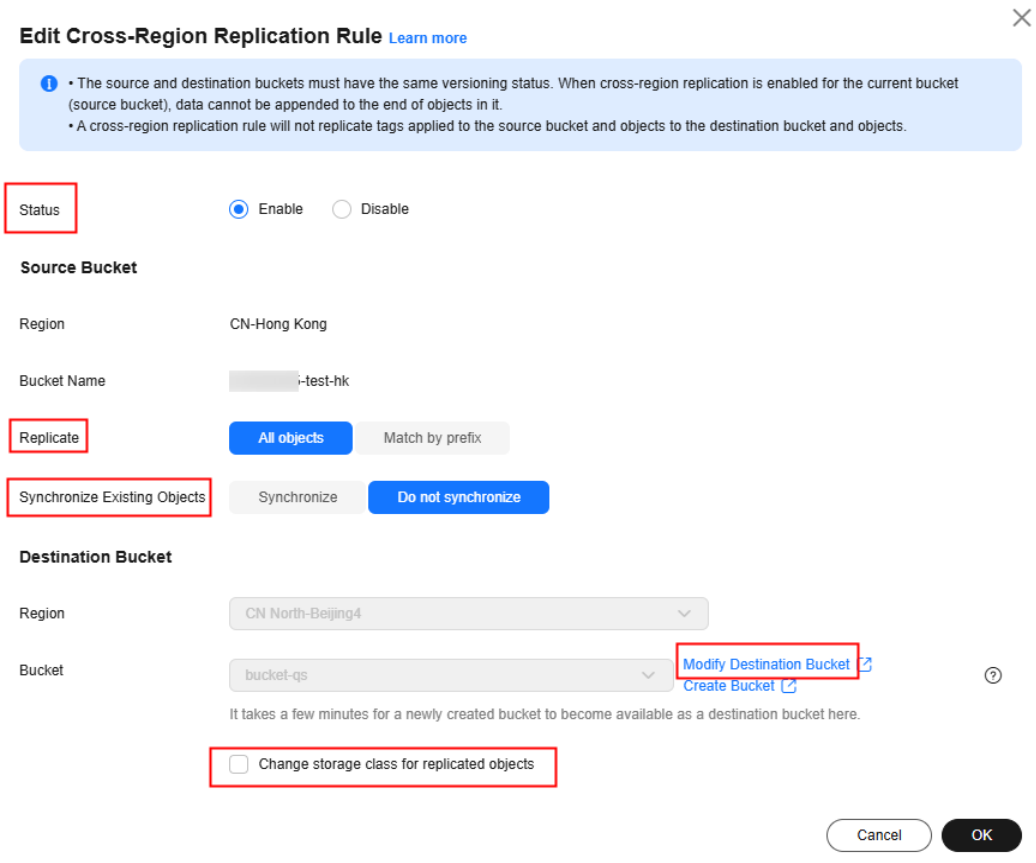
Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane on the left, choose **Data Management** > **Cross-Region Replication**. The **Cross-Region Replication** page is displayed.

Step 4 (Optional) Edit a cross-region replication rule.

1. Click **Edit** in the **Operation** column of the rule to be modified. The **Edit Cross-Region Replication Rule** dialog box is displayed.

   Figure 8-28 Editing a cross-region replication rule



2. Modify the cross-region replication rule.

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Table 8-43 Parameters for modifying a cross-region replication rule

Parameter		Description
Status		Indicates the status of the cross-region replication rule. You can enable or disable the cross-region replication rule.
Source Bucket	Replicate	Indicates the objects the rule will apply to. – **All objects**: The rule applies to all objects in the bucket. – **Match by prefix**: The rule applies only to objects with the specified prefix.
	Prefix	If you select **Match by prefix** for **Replicate**, you need to specify an object name prefix. The rule will apply only to objects with the specified prefix in the source bucket. – You must set **Prefix** to a value no longer than 1,024 characters. – If the specified prefix overlaps with the prefix of an existing rule, OBS regards these two rules as one and forbids you to configure the one you are configuring. For example, if there is already a rule with prefix **abc** in OBS, you cannot configure another rule whose prefix starts with **abc**. – To copy a folder, end the prefix with a slash (/), for example, **folder1/**.
	Synchronize Existing Objects	Indicates whether to synchronize the objects that were already in the source bucket before the rule configuration to the destination bucket. By default, these objects are not synchronized.
Destination Bucket	Region	Indicates the region of the destination bucket. The destination and source buckets must be in different regions. Click **Modify Destination Bucket** on the right to change the region where the destination bucket resides.
	Bucket	Indicates the destination bucket. Click **Modify Destination Bucket** on the right to modify the destination bucket. **Modifying the destination bucket will change the destination bucket of all cross-region replication rules.** **NOTE** If a bucket is newly created, you may need to wait for several minutes before you can view the bucket in the drop-down list of the destination bucket.

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Parameter		Description
	Change storage class for replicated objects	Changes the storage class of objects replicated from the source bucket to the destination bucket. – By default, this option is not selected, indicating that the storage class of object copies is the same as that of the source objects. – If you need to change the storage class of object copies, select this parameter, then you can specify a storage class.
Permissions	Replicate KMS encrypted objects	Replicates KMS encrypted objects from the source bucket to the destination bucket. OBS will try to copy KMS encrypted objects no matter whether this option is selected or not. – If this option is selected, only the IAM agencies that have any permission for the global project and have the **KMS Administrator** permission for both source and destination regions are displayed in the drop-down list of **IAM Agency** in the **Edit Cross-Region Replication Rule** dialog box. – If this option is not selected, only the IAM agencies that have any permission for the global project, but do not have the **KMS Administrator** permission for either the source or destination region are displayed in the drop-down list of **IAM Agency** in the **Edit Cross-Region Replication Rule** dialog box. If KMS is not available in the destination region or the agency does not have the **KMS Administrator** permission in the source and destination regions, KMS encrypted objects will fail to be replicated to the destination bucket, and the object replication status will be failed. After a KMS-encrypted object is replicated to the destination bucket, the key for encrypting the object copy changes to the default key **obs/default** of the destination region.

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Parameter		Description
	IAM Agency	Delegates OBS to operate your resources, so that OBS can use this agency to implement cross-region replication. Click **Modify IAM Agency** on the right to modify the IAM agency. If there is no IAM agency available, click **View IAM Agencies** to create one. If you have already created IAM agencies, select one from the drop-down list. The IAM agency must meet the following requirements: – The IAM agency must be for OBS and the OBS project must have the **Tenant Administrator** permission. – If **Replicate KMS encrypted objects** is selected, the agency must have the **KMS Administrator** permission. The authorization scope of the agency must be set to **Region-specific projects**, and the source and destination regions must be selected.

3. Click **OK** to complete the modification of the cross-region replication rule.

Step 5 (Optional) Disable a cross-region replication rule.

If a cross-region replication rule is enabled, you can disable it as follows:

1. Click **Disable** in the **Operation** column of the target rule.

   You can also select multiple rules and click **Disable** above the list to disable them in batches.
2. In the **Disable This Cross-Region Replication Rule** dialog box, click **OK**.

Step 6 (Optional) Enable a cross-region replication rule.

If a cross-region replication rule is disabled, you can enable it as follows:

1. Click **Enable** in the **Operation** column of the target rule.

   You can also select multiple rules and click **Enable** above the list to enable them in batches.
2. In the **Enable This Cross-Region Replication Rule** dialog box, click **OK**.

Step 7 (Optional) Delete a cross-region replication rule.

1. Click **Delete** in the **Operation** column of the target rule.

   You can also select multiple rules and click **Delete** above the list to delete them in batches.
2. In the **Delete This Cross-Region Replication Rule** dialog box, click **OK**.

----End

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Using OBS APIs

- **Editing a cross-region replication rule**: Use the API for **configuring cross-region replication for a bucket** to edit a rule by modifying the request elements.
- **Disabling a cross-region replication rule**: Use the API for **configuring cross-region replication for a bucket** to disable a rule by changing the value of the request element **Status** to **Disabled**.
- **Enabling a cross-region replication rule**: Use the API for **configuring cross-region replication for a bucket** to enable a rule by changing the value of the request element **Status** to **Enabled**.
- **Deleting a cross-region replication rule**

References

Creating an Agency for Cross-Region Replication

Step 1 In the **Create Cross-Region Replication Rule** dialog box on **OBS Console**, click **View IAM Agencies** to go to the **Agencies** page on the IAM console.

Step 2 Click **Create Agency**. On the displayed page, set the parameters related to the agency for cross-region replication and retain the default settings for other parameters.

Table 8-44 Parameters

Parameter	Description
Agency Name	Name of the agency to be created The agency name cannot be left blank.
Agency Type	You can grant permissions to another account or cloud service for managing resources in your account. Select **Cloud service** for **Agency Type**.
Cloud Service	You can grant permissions to a cloud service for managing resources in your account. This parameter is mandatory when **Agency Type** is set to **Cloud service**. Select **Object Storage Service (OBS)** for **Cloud Service**.

Step 3 Click **OK**. In the **Agency Created** dialog box that is displayed, click **Cancel**. If the newly created agency is displayed in the agency list, the agency is created successfully.

Step 4 Grant OBS permissions to the created agency.

1. In the navigation pane of the IAM console, choose **Agencies**.
2. Click **Authorize** in the **Operation** column of the agency created in **Step 2**.
3. On the **Select Policy/Role** page, select **Tenant Administrator** and click **Next**.
4. On the **Select Scope** page, select **All resources** and click **OK**.

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5. In the **Information** dialog box that is displayed, click **OK**.
6. On the **Finish** page, click **Finish**.

Step 5 (Optional) If **Replicate KMS encrypted objects** is selected, the IAM agency also needs the **KMS Administrator** permission for the regions where the source and destination buckets are located.

1. In the navigation pane of the IAM console, choose **Agencies**.
2. Click **Authorize** in the **Operation** column of the agency created in **Step 2**.
3. On the **Select Policy/Role** page, search for and select **KMS Administrator**. Then, click **Next**.
4. Select **Region-specific projects** for **Scope**, and select the projects for the regions where the source and destination buckets are located.
5. Click **OK**.

----End

FAQs About Cross-Region Replication Within an Account

- **Why Objects Are Not Copied to the Destination Bucket After the Cross-Region Replication Rule Has Been Created?**
- **Will an Object Deletion in a Source Bucket Be Synchronized to the Destination Bucket?**

8.7.3 Cross-Region Replication Across Accounts Using OMS

Scenarios

Cross-region replication across accounts is to replicate data from a source bucket in one region of an account to a destination bucket in another region of another account.

This section describes how to replicate data between buckets of different accounts in different regions using OMS console, OMS APIs, and obsutil.

Replication scope: files, folders, object lists, objects with specified prefix, or specified URL lists

Replicable object data: object content, metadata (object name, size, last modification time, creator, version number, and user-defined metadata), ACL (supported by obsutil), and storage class

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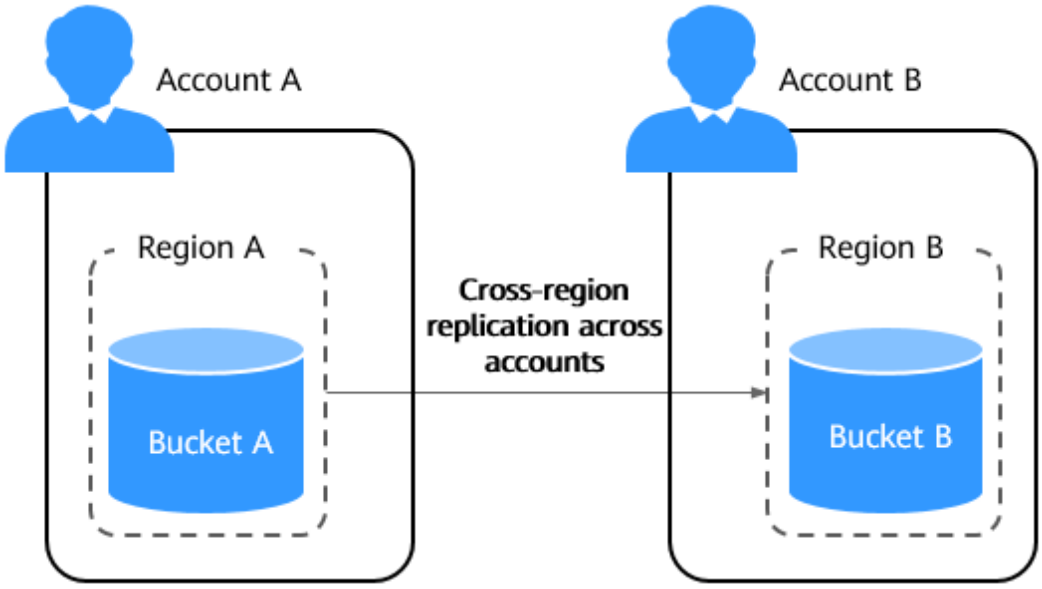
Figure 8-29 Cross-region replication across accounts



Cross-region replication across accounts applies to the following scenarios:

- **Regulatory compliance**

  OBS stores data across AZs that are relatively far apart from each other, but regulatory compliance may require further distances. Cross-region replication enables you to meet regulatory requirements.

- **Low latency**

  The same OBS resources may need to be accessed from different locations. To minimize the access latency, you can use cross-region replication to create object copies in the nearest region.

- **Data replication**

  You want to migrate data stored in OBS to the data center in another region.

- **Data backup and disaster recovery**

  You want to create explicit backups for all data written to OBS in the data center of another region to ensure data remains available if there is any damage.

- **Ease of maintenance**

  You have compute clusters used to analyze the same group of objects in two different OBS regions and may need to maintain object copies in these two regions.

NOTICE

OBS helps you replicate your service data stored in OBS to a specified region, but Huawei Cloud has no access to your data. You need to ensure the legal compliance of your use of OBS on your own. If your replication involves cross-border transfer, ensure that your use complies with relevant laws and regulations.

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Constraints

The following are constraints on migrating data using **Object Storage Migration Service (OMS)**:

Table 8-45 OMS constraints

Item	Description
Objects with multiple versions	By default, OMS migrates only the latest version of objects in source buckets.
Storage class of destination buckets	The storage class of destination buckets can be Standard, Infrequent Access, Archive, or Deep Archive.
Migration network	Migrations over the Internet or intranets are supported. Migrations over private lines are not supported.
Metadata migration	Only Chinese characters, English characters, digits, and hyphens (-) can be migrated. Other characters cannot be migrated. Chinese punctuation marks cannot be URL-encoded during the migration. If metadata contains Chinese punctuation marks, the metadata and the corresponding object will fail to be migrated. • Chinese characters are URL-encoded during the migration. • English characters, digits, and hyphens (-) are directly migrated without being encoded.
Migration scope	A single migration task or migration task group can only migrate data of one bucket. If data of multiple buckets needs to be migrated, you need to create multiple tasks or task groups.
Symbolic links	Symbolic link files cannot be migrated. Symbolic link files will be recorded as failed, and the migration task will also be marked as failed. Other files can be migrated normally. If the source contains symbolic links, you need to enter the actual file path.
Migration of object ACLs	OMS cannot migrate object ACLs.

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Item	Description
Migration speed	Generally, OMS can migrate 10 TB to 20 TB of data per day. For higher migration efficiency, you are advised to use **storage migration workflows** on MgC. MgC allows you to migrate data using dedicated, scalable migration clusters and up to 20 Gbit/s of bandwidth. However, the speed depends on the number and size of source objects, bandwidth, and transmission distance over the Internet between the source and destination buckets. You are advised to create a migration task to test the migration speed. The maximum migration speed is five times the average speed of a single task because up to five tasks can be executed concurrently in a region by default. If you need to define a higher number of concurrent tasks, you can **create a storage migration workflow** on MgC.
Archived data	You need to restore archived data before the migration. Note that when there is archived data to be migrated, you need to: • Create migration tasks after the restoration is complete. • Configure a validity period for restored data based on the total amount of data to be migrated. This helps prevent migration failures because restored data becomes archived again during the migration. • Pay your source cloud vendor for restoring archived data. To learn about the pricing details, contact your source cloud vendor.
Migration tasks	A maximum of five concurrent migration tasks are allowed for your account per region. **NOTE** If your destination regions are CN North-Beijing1 and CN South-Guangzhou, you can run up to 10 migration tasks concurrently.
	A maximum of 1,000,000 migration tasks can be created in your account per region within a 24-hour period.
Migration Task Groups	A maximum of five concurrent migration task groups are allowed for your account per region. **NOTE** If your destination regions are CN North-Beijing1 and CN South-Guangzhou, you can run up to 10 migration task groups concurrently.

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Item	Description
Synchronization tasks	Synchronization tasks share quotas with migration tasks and migration task groups, but enjoy a higher priority. A maximum of five concurrent synchronization tasks are allowed for your account per region.
Object list files	• An object list file cannot exceed 1,024 MB. • An object list file must be a .txt file, and its metadata **ContentType** must be **text/plain**. • An object list file must be in UTF-8 without BOM. • Each line in an object list file can contain only one object name, and the object name must be URL-encoded. • Spaces are not allowed in each line in an object list file. Spaces may cause migration failures because they may be mistakenly identified as object names. • Each line in an object list file cannot be longer than 65,535 characters, or the migration will fail. • The **ContentEncoding** metadata of an object list file must be left empty, or the migration will fail.

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Item	Description
URL list files	• A URL list file cannot exceed 1,024 MB. • A URL list file must be a .txt file, and its metadata **ContentType** must be **text/plain**. • A URL list file must be in UTF-8 without BOM. • Each line in a URL list file can contain only one URL and one destination object name. • Each line in a URL list file cannot be longer than 65,535 characters, or the migration will fail. • The **ContentEncoding** metadata of a URL list file must be left empty, or the migration will fail. • Spaces are not allowed in each line in a URL list file. Spaces may cause migration failures because they may be mistakenly identified as object names. • In a URL list file, you must use a tab character (\t) to separate the URL and destination object name in each line. The format is **[***URL***][***Tab character***][***Destination object name***]**. Chinese and special characters in the source and destination object names must be URL-encoded. For example: http://xxx.xxx.xxx.xxx.com/doc/%e6%96%87%e4%bb%b61.txt doc/%e6%96%87%e4%bb%b61.txt http://xxx.xxx.xxx.xxx.com/doc/thefile2.txt doc/thefile2.txt http://xxx.xxx.xxx.xxx.com/the%20file.txt the%20file.txt http://xxx.xxx.xxx.xxx.com/the%20file2.txt the+file2.txt http://xxx.xxx.xxx.xxx.com/doc/thefile.txt doc/thefile.txt In the preceding example, after the files represented by the URLs are copied to the destination bucket, the objects are named **doc/***File 1***.txt**, **doc/thefile2.txt**, **the file.txt**, **the file2.txt**, and **doc/thefile.txt**. The URL encoding must start from the second character after the domain name in a line. Do not encode the protocol header, domain name, or slash before or after the domain name. Otherwise, the format verification will fail. In each line, use a tab character (Tab key on the keyboard) to separate the URL and the destination object name. Do not use spaces. • URLs in a list file can be accessed using HEAD and GET methods.

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Item	Description
Failed object list files	A maximum of 100,000 failed objects can be recorded in a list file. **NOTE** If more than 100,000 objects fail to be migrated in a migration task, you are advised to rectify the fault based on the existing failed object list and perform the migration again.

Billing for Cross-Region Replication Across Accounts

- When you use the OMS console or APIs to migrate data, OBS APIs of the source and destination ends are invoked to upload and download data. You will be billed for the API requests and data download traffic. For details, see **OMS Billing**. In addition, you will be billed for storing the objects in the destination bucket. For details, see **Storage Costs**.
- When you use obsutil to replicate data across regions, you will be billed for requests, traffic, and storage. For details, see **Table 8-46**.

Table 8-46 Billing for data replication across regions

Action	Billing Item	Description	Billing Mode
Replicate data across regions	Requests	You are billed for the number of successfully replicated objects. Successfully replicating one object creates a copy request. For details, see **Copying Objects**. • For non-multipart objects, replicating an object creates a GET request to the source bucket and a PUT request to the destination bucket; deleting an object from the source bucket creates a DELETE request to the destination bucket. • For multipart objects, replicating each part creates a GET request to the source bucket and a PUT request to the destination bucket. For details about how requests are billed, see **Requests**.	Pay-per-use

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Action	Billing Item	Description	Billing Mode
	Data transfer	Traffic generated when you replicate data from the source bucket to the destination bucket in another region. Billing only applies to the **data transferred out of the source bucket**. If objects are encrypted using **server-side encryption**, the cost of their cross-region replication traffic is calculated based on the length of the plaintext for SSE-KMS and SSE-OBS.	Pay-per-use
	Storage space	Space occupied by the replicated objects in the destination bucket If you have specified another storage class for object copies in the destination bucket, these copies are billed based on the new storage class. If objects are encrypted using **server-side encryption**, their storage cost is calculated based on the length of the ciphertext.	Pay-per-use Resource packages
Synchronize existing objects	Requests	You are billed for the number of existing objects that are successfully replicated to the destination bucket. Billing applies to the number of objects that are successfully replicated. You are also billed for listing the existing objects.	Pay-per-use
	Data transfer	Traffic generated when OBS replicates existing objects to the destination bucket in another region. Billing only applies to the **data transferred out of the source bucket**. If historical objects are encrypted using **server-side encryption**, the cost of their cross-region replication traffic is calculated based on the length of the plaintext for SSE-KMS and SSE-OBS.	Pay-per-use

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Action	Billing Item	Description	Billing Mode
	Storage space	Space occupied by the replicated objects in the destination bucket If you have specified another storage class for object copies in the destination bucket, these copies are billed based on the new storage class. If historical objects are encrypted using **server-side encryption**, their storage cost is calculated based on the length of the ciphertext.	Pay-per-use Resource packages

Prerequisites

- A source bucket has been created in a region of an account.
- A destination bucket has been created in another region of another account. To create a bucket, see **Creating a Bucket**.
- When obsutil is used to replicate objects across accounts and regions, the version of the source bucket is 3.0 or later, and cross-region replication is available in the region of the source bucket.

Cross-Region Replication Across Accounts

You can use the OMS console or APIs to migrate data across accounts and regions, or use obsutil to replicate data across accounts and regions.

NOTICE

OMS does not automatically migrate data. That is, data changes in the source bucket will not be automatically synchronized to the destination bucket. After data in the source bucket is modified, you need to execute the migration task again to synchronize the incremental data in the source bucket to the destination bucket.

Using the OMS Console

Use the OMS console to migrate data in OBS buckets. For details, see **Migration Process**.

NOTE

- If the data volume of a single bucket does not exceed 3 TB or there are no more than 5 million objects, you can **create a migration task** to migrate data.
- If the data volume of a single bucket is greater than 3 TB or there are more than 5 million objects, you can **create a migration task group** to migrate data.

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Using OMS APIs

- Creating a Migration Task
- Creating a Migration Task Group

Using the CLI Tool - obsutil

To use obsutil to replicate objects across regions and accounts, you must enable the cross-region replication mode, which means that the **crr** parameter is mandatory.

NOTICE

- Do not change the source objects in the OBS bucket when copying a single object or objects in batches. Otherwise, the operation may fail or data may be inconsistent.
- If the storage class of the object to be copied is **cold**, you must restore the object to be copied first. Otherwise, the copy fails.
- To copy objects, you must have the read permission on the objects to be copied and the write permission on the destination bucket.
- If the client-side cross-region replication function is not enabled, ensure that the source bucket and destination bucket are in the same region.
- If the source bucket is a parallel file system (supporting POSIX), the destination bucket must also be a parallel file system.

Constraints

- The source path and destination path cannot be the same.
- The source path and destination path cannot be overlapped either.
  - If the source path overlaps with the prefix of the destination path, recursive replication applies.
  - If the destination path overlaps with the prefix of the source path, the replication may overwrite objects in the source path.

Command Line Structure

- In Windows
  - Copying a single object
    ```
    obsutil cp obs://srcbucket/key obs://dstbucket/[dest] [-dryRun][-u] [-crr] [-vlength] [-vmd5] [-p=1] [-threshold=52428800] [-versionId=xxx] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Copying objects in batches
    ```
    obsutil cp obs://srcbucket[/key] obs://dstbucket[/dest] -r [-dryRun][-f] [-flat] [-u] [-crr] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
- In Linux or macOS
  - Copying a single object
    ```
    ./obsutil cp obs://srcbucket/key obs://dstbucket/[dest] [-dryRun] [-u] [-crr] [-vlength] [-vmd5] [-p=1] [-threshold=52428800] [-versionId=xxx] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

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  - Copying objects in batches

```
./obsutil cp obs://srcbucket[/key] obs://dstbucket[/dest] -r [-dryRun] [-f] [-flat] [-u] [-crr] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

Examples

- Take the Windows OS as an example. Run the **obsutil cp obs://bucket-test/key obs://bucket-test2** command to copy a single object.

```
obsutil cp obs://bucket-test/key obs://bucket-test2
Start at 2024-09-30 08:30:09.0815415 +0000 UTC

Parallel:       3                 Jobs:         3
Threshold:      50.00MB           PartSize:     auto
CheckpointDir: xxxx

[=================================================] 100.00% 6/s 0s
Waiting for the copied key to be completed on server side.
Copy successfully, 19B, obs://bucket-test/key --> obs://bucket-test2/key
ext.txt, cost [1708], status [200], request id [00000192420D227E4017336A12F1DC22]
```

- Take the Windows OS as an example. Run the **obsutil cp obs://bucket-test/temp/ obs://bucket-test2 -f -r** command to copy objects in batches.

```
obsutil cp obs://bucket-test/temp/ obs://bucket-test2 -r -f
Start at 2024-09-30 08:34:02.7819703 +0000 UTC

Parallel:       5                 Jobs:         5
Threshold:      50.00MB           PartSize:     auto
CheckpointDir: xxxx

Task id: 0476929d-9d23-4dc5-b2f8-0a0493f027c5
OutputDir: xxxx

[=============================================================] 100.00% 10/s 0s
Succeed count:  5       Failed count:   0
Metrics [max cost:298 ms, min cost:192 ms, average cost:238.00 ms, average tps:9.71, transferred size: 7.20MB]
Task id: 0476929d-9d23-4dc5-b2f8-0a0493f027c5
```

- For more examples, see **Common Examples**.

Parameter Description

Parameter	Optional or Mandatory	Description
srcbucket	Mandatory	The source bucket name
dstbucket	Mandatory	The destination bucket name
dest	Optional	The destination object name when copying an object, or the name prefix of destination objects when copying objects in batches

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Parameter	Optional or Mandatory	Description
key	Mandatory for copying an object. Optional for copying objects in batches.	The source object name when copying an object, or the name prefix of source objects when copying objects in batches The rules are as follows: • This parameter cannot be left blank when copying an object. – If **dest** is left blank, the source object is copied to the root directory of the destination bucket. – If the value of **dest** ends with a slash (/), the destination object name is the value of **dest** plus the source object name. Otherwise, the destination object name is the value of **dest**. • If this parameter is left blank when copying objects in batches, all objects in the source bucket are copied. If not, objects whose name prefix is the set value in the source bucket are copied. The rules for confirming the name of the destination object are as follows: – If the value of **dest** ends with a slash (/), the destination object name is the value of **dest** plus the source object name. – If the value of **dest** does not end with a slash (/), the destination object name is *the value of **dest**/source object name*. • If this parameter is configured but the **flat** parameter is not when copying objects in batches, the name of the source object contains the name prefix of the parent object. If **flat** is configured, then the name of the source object does not contain the name prefix of the parent object. **NOTE** For details about how to use this parameter, see **Copy**.
fr	Optional for copying an object (additional parameter)	Generates an operation result file when copying an object.
flat	Optional for copying objects in batches (additional parameter)	The name prefix of the parent object is excluded when copying objects in batches.

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Parameter	Optional or Mandatory	Description
dryRun	Optional (additional parameter)	Conducts a dry run.
crr	Mandatory for cross-region replication across accounts	Enables the client-side cross-region replication function. In this mode, data is directly copied to the destination bucket from the source bucket through data stream. The buckets can be any two OBS buckets. • If this parameter is configured, the configuration of client-side cross-region replication must be updated in the configuration file. For details, see **Updating a Configuration File**. • When cross-region replication is enabled, the upload/download bandwidth, CPU, and memory resources of the host where commands are executed will be occupied, which may deteriorate the host performance. **NOTE** The configurations of the source bucket and destination bucket are respectively **akCrr/skCrr/tokenCrr/endpointCrr** and **ak/sk/token/endpoint** in the configuration file.
vlength	Optional (additional parameter)	Verifies whether the object size in the destination bucket is the same as that in the source bucket after the copy task completes. **This parameter must be used together with crr.**
vmd5	Optional (additional parameter)	Verifies whether the MD5 value of the destination bucket is the same as that of the source bucket after the copy task completes. • **This parameter must be used together with crr.** • **Objects in the source bucket must contain metadata x-obs-meta-md5chksum, or MD5 verification will be skipped.** After the MD5 verification is successful, this parameter value is used for metadata **x-obs-meta-md5chksum** of the destination object, for later MD5 verification during download or replication. • **If your object needs encryption, do not use this parameter.**

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Parameter	Optional or Mandatory	Description
u	Optional (additional parameter)	Indicates incremental copy. If this parameter is set, each object can be copied only when it does not exist in the destination bucket, its size is different from the namesake one in the destination bucket, or it has the latest modification time.
p	Optional (additional parameter)	The maximum number of concurrent multipart copy tasks when copying an object. The default value is the value of **defaultParallels** in the configuration file.
threshold	Optional (additional parameter)	The threshold for enabling multipart copy. If the size of the object to be copied is smaller than the threshold, copy the object directly. If not, a multipart copy is required. The default value is the value of **defaultBigfileThreshold** in the configuration file. Unit: byte This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes). **NOTE** If you copy an object directly, no part record is generated, and resumable transmission is not supported.
versionId	Optional for copying an object (additional parameter)	The source object version ID that can be specified when copying an object
acl	Optional (additional parameter)	The access control policies for destination objects that can be specified when copying objects. Possible values are: • **private**: Only users granted permissions by the object ACL can access the object. • **public-read**: Anyone can read objects in the bucket. • **public-read-write**: Anyone can read, write, or delete objects in the bucket. • **bucket-owner-full-control**: Only the bucket owner has full control over objects in the bucket.

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Parameter	Optional or Mandatory	Description
sc	Optional (additional parameter)	The storage classes of the destination objects that can be specified when copying objects. Possible values are: • **standard**: The Standard storage class. It features low access latency and high throughput, and is suitable for storing frequently accessed data (multiple times per month on average) or data that is smaller than 1 MB. • **warm**: The Infrequent Access storage class. It is suitable for storing infrequently accessed (less than 12 times per year on average) data, but when needed, the access has to be fast. It has a slightly lower availability than Standard. • **cold**: The Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once per year on average) data. • **deep-archive**: The Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely accessed (once every few years on average). This storage class costs less than the Archive storage class, but takes longer (usually several hours) to restore data.
meta	Optional (additional parameter)	The standard or user-defined metadata that can be specified during object replication. • Standard metadata includes **Content-Type**, **Content-Encoding**, **Cache-Control**, **Content-Disposition**, **Content-Language** and **Expires**. • User-defined metadata must be in the format of *key:value*. Multiple user-defined metadata items are separated by number signs (#), for example, *key1:value1*#*key2:value2*#*key3:value3*, which indicates that the object copy in the destination bucket contains three groups of user-defined metadata: *key1:value1*, *key2:value2*, and *key3:value3*.

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Parameter	Optional or Mandatory	Description
fs	Optional (additional parameter)	Specifies whether the method of listing parallel file systems is applied. If you are listing parallel file systems, you are recommended to add this parameter. ● After this parameter is enabled, **marker** and **limit** will be ignored. Then, the size of the bucket, parallel file system, or directory will be calculated. ● This parameter is only supported for obsutil 5.5.12 or later. ● With this method, the listing time required varies largely depending on the directory structures.
ps	Optional (additional parameter)	The size of each part in a multipart copy task ● The default value is the value of **defaultPartSize** in the configuration file. The parameter can be set to **auto**. In this case, obsutil automatically configures the part size for each multipart task based on the source file size. ● Range: **100KB** to **5GB** ● Unit: byte. This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes).
cpd	Optional (additional parameter)	The folder where the part records reside. The default value is **.obsutil_checkpoint**, the subfolder in the home directory of the user who executes obsutil commands. A part record is generated during a multipart copy and saved to the **upload** subfolder. After the copy succeeds, its part record is deleted automatically. If the copy fails or is suspended, the system attempts to resume the task according to its part record when you perform the copy the next time.
r	Mandatory for copying objects in batches (additional parameter)	Copies objects in batches based on a specified name prefix of objects in the source bucket.

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Parameter	Optional or Mandatory	Description
f	Optional for copying objects in batches (additional parameter)	Runs in force mode.
j	Optional for copying objects in batches (additional parameter)	The maximum number of concurrent tasks for copying objects in batches. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.

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Parameter	Optional or Mandatory	Description
exclude	Optional for copying objects in batches (additional parameter)	The matching patterns of source objects that are excluded. After this parameter is specified, if the name of the object to be copied matches the value of this parameter, the object is skipped. For example, if this parameter is set to ***.txt**, all files whose names end with **.txt** are skipped and not copied. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent ***** and **\?** to represent **?**. ● Multiple **exclude** parameters can be specified, for example, **-exclude=*.xxx -exclude=*.xxx**. **Restrictions**: This matching pattern applies only to objects whose names do not end with a slash (/). **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute path of an object, including the object name prefix and object name starting from the root directory. For example, if the path of an object in the bucket is **obs://bucket/src1/src2/test.txt**, then the absolute path of the object is **src1/src2/test.txt**.

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Parameter	Optional or Mandatory	Description
include	Optional for copying objects in batches (additional parameter)	The included matching patterns of source objects. After this parameter is specified, if the name of the object to be copied matches the value of this parameter, the object is copied. For example, if this parameter is set to ***.txt**, all objects whose names end with **.txt** are copied. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent ***** and **\?** to represent **?**. ● Multiple **include** parameters can be specified, for example, **-include=*.xxx -include=*.xxx**. **Restrictions**: ● This matching pattern applies only to objects whose names do not end with a slash (/). ● If both the **exclude** and **include** parameters are configured, the **exclude** rules are applied first. If the name of an object to be copied does not match **exclude**, OBS checks whether the object name matches the value of **include**. If yes, the object is copied. If no, the object is skipped. **Example**: `./obsutil cp obs://src-bucket/ obs://target-bucket/ -include=/src-object/* -f -r` This command copies files whose names start with **src-object/** from the **src-bucket** bucket to the **target-bucket** bucket. **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute path of an object, including the object name prefix and object name starting from the root directory. For example, if the path of an object in the bucket is **obs://bucket/src1/src2/test.txt**, then the absolute path of the object is **src1/src2/test.txt**.

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Parameter	Optional or Mandatory	Description
timeRange	Optional for copying objects in batches (additional parameter)	The time range matching pattern when copying objects. Only objects whose latest modification time is within the configured time range are copied. This pattern has a lower priority than the file matching patterns (**exclude**/**include**). That is, the time range matching pattern is executed after the configured file matching patterns. ● Time in the matching pattern is the UTC time. ● The matching time range is represented in *time1*-*time2*, where *time1* must be earlier than or the same as *time2*. The time format is *yyyyMMddHHmmss*. ● Automatic formatting is supported. For example, *yyyyMMdd* is equivalent to *yyyyMMdd***000000**, and *yyyyMM* is equivalent to *yyyyMM***01000000**. ● If this parameter is set to ***-***time2*, all files whose last modification time is earlier than *time2* are matched. If it is set to *time1*-*, all files whose last modification time is later than *time1* are matched. **This matching pattern applies only to objects whose names do not end with a slash (/).**
mf	Optional (additional parameter)	Indicates that the name matching pattern (**include** or **exclude**) and the time matching pattern (**timeRange**) also take effect on objects whose names end with a slash (/).

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Parameter	Optional or Mandatory	Description
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (possibly success, failure, and warning files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. • A result file should be named as follows: **cp_{succeed | failed | warning}_report**_*time*_*TaskId*.**txt**. • By default, the maximum size of a single result file is 30 MB. You can set the maximum size by configuring **recordMaxLogSize** in the configuration file. • By default, the maximum number of result files that can be retained is 1,024. You can set the maximum number by configuring **recordBackups** in the configuration file. • If there are multiple folders and files and you need to confirm the details of a failed task, refer to the failure result file **cp_failed_report**_*time*_*TaskId*.**txt** in the result folder and the **log files** in the log path.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. To learn the parameters that can be configured in this file, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Response

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Field	Description
Parallel	The parameter **-p** in the request
Jobs	The parameter **-j** in the request
Threshold	The parameter **-threshold** in the request
PartSize	The parameter **-ps** in the request
Exclude	The parameter **-exclude** in the request
Include	The parameter **-include** in the request
TimeRange	The parameter **-timeRange** in the request
VerifyLength	The parameter **-vlength** in the request
VerifyMd5	The parameter **-vmd5** in the request
CheckpointDir	The parameter **-cpd** in the request
OutputDir	The parameter **-o** in the request
ArcDir	The parameter **-arcDir** in the request
Succeed count	The number of successful tasks
Failed count	The number of failed tasks
Skip count	The number of tasks that are skipped during incremental upload, download, or copy, and synchronous upload, download, or copy. **NOTE** Skipped tasks are recorded into successful tasks.
Warning count	The number of tasks that are executed successfully but contain warnings. **NOTE** • The task for which a warning is generated may be a failure or a success, which needs to be further determined according to the corresponding result list. • The number of tasks that generate warnings is independent of the number of successful or failed tasks. The total number of tasks is the number of successful tasks plus the number of failed tasks.
Succeed bytes	The number of bytes that are successfully uploaded or downloaded.
max cost	The maximum duration of all tasks, in ms
min cost	The minimum duration of all tasks, in ms
average cost	The average duration of all tasks, in ms
average tps	The average number of tasks completed per second
Task id	The unique ID of an operation, which is used to search for the result file generated for a batch task

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8.7.4 Same-Region Replication Within an Account Using OMS

Scenarios

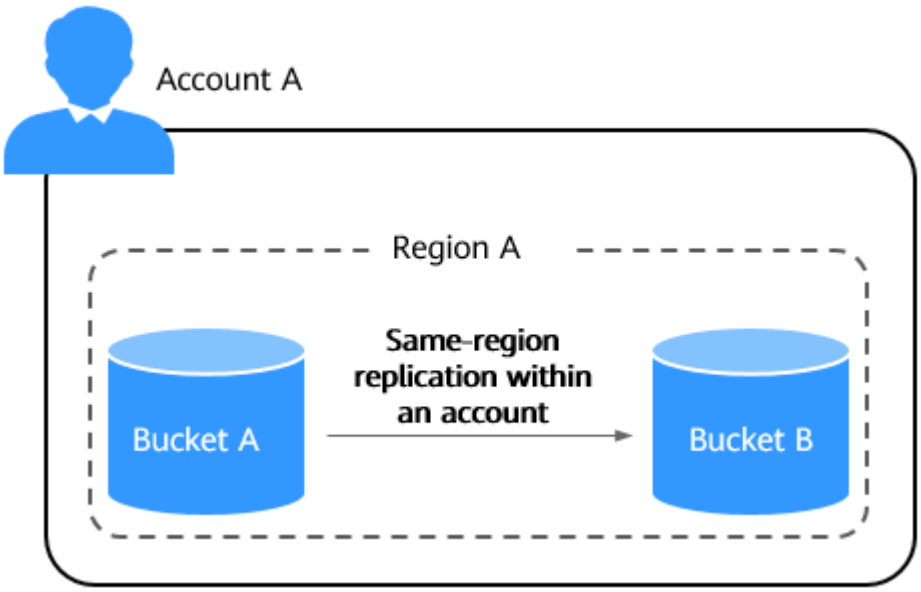
Same-region replication within an account is to replicate data from a source bucket in one region of an account to a destination bucket in the same region of the same account.

This section describes how to replicate data between buckets of the same account in the same region using OMS console, OMS APIs, OBS APIs, OBS SDKs, OBS Browser+, and obsutil.

Replication scope: files/folders, object lists, object prefixes, URL lists, and objects modified after a specified time

Replicable object data: object content, metadata (object name, size, last modification time, creator, version number, and user-defined metadata), ACL (supported by OBS APIs and obsutil), WORM retention policy (supported by OBS APIs), object tag (supported by OBS APIs), and storage class

Figure 8-30 Same-Region Replication Within an Account



NOTICE

OBS helps you replicate your service data stored in OBS to another bucket in the same region, but Huawei Cloud has no access to your data. You need to ensure the legal compliance of your use of OBS on your own.

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Constraints

The following are constraints on migrating data using **Object Storage Migration Service (OMS)**:

Table 8-47 OMS constraints

Item	Description
Objects with multiple versions	By default, OMS migrates only the latest version of objects in source buckets.
Storage class of destination buckets	The storage class of destination buckets can be Standard, Infrequent Access, Archive, or Deep Archive.
Migration network	Migrations over the Internet or intranets are supported. Migrations over private lines are not supported.
Metadata migration	Only Chinese characters, English characters, digits, and hyphens (-) can be migrated. Other characters cannot be migrated. Chinese punctuation marks cannot be URL-encoded during the migration. If metadata contains Chinese punctuation marks, the metadata and the corresponding object will fail to be migrated. • Chinese characters are URL-encoded during the migration. • English characters, digits, and hyphens (-) are directly migrated without being encoded.
Migration scope	A single migration task or migration task group can only migrate data of one bucket. If data of multiple buckets needs to be migrated, you need to create multiple tasks or task groups.
Symbolic links	Symbolic link files cannot be migrated. Symbolic link files will be recorded as failed, and the migration task will also be marked as failed. Other files can be migrated normally. If the source contains symbolic links, you need to enter the actual file path.
Migration of object ACLs	OMS cannot migrate object ACLs.

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Item	Description
Migration speed	Generally, OMS can migrate 10 TB to 20 TB of data per day. For higher migration efficiency, you are advised to use **storage migration workflows** on MgC. MgC allows you to migrate data using dedicated, scalable migration clusters and up to 20 Gbit/s of bandwidth. However, the speed depends on the number and size of source objects, bandwidth, and transmission distance over the Internet between the source and destination buckets. You are advised to create a migration task to test the migration speed. The maximum migration speed is five times the average speed of a single task because up to five tasks can be executed concurrently in a region by default. If you need to define a higher number of concurrent tasks, you can **create a storage migration workflow** on MgC.
Archived data	You need to restore archived data before the migration. Note that when there is archived data to be migrated, you need to: • Create migration tasks after the restoration is complete. • Configure a validity period for restored data based on the total amount of data to be migrated. This helps prevent migration failures because restored data becomes archived again during the migration. • Pay your source cloud vendor for restoring archived data. To learn about the pricing details, contact your source cloud vendor.
Migration tasks	A maximum of five concurrent migration tasks are allowed for your account per region. **NOTE** If your destination regions are CN North-Beijing1 and CN South-Guangzhou, you can run up to 10 migration tasks concurrently.
	A maximum of 1,000,000 migration tasks can be created in your account per region within a 24-hour period.
Migration Task Groups	A maximum of five concurrent migration task groups are allowed for your account per region. **NOTE** If your destination regions are CN North-Beijing1 and CN South-Guangzhou, you can run up to 10 migration task groups concurrently.

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Item	Description
Synchronization tasks	Synchronization tasks share quotas with migration tasks and migration task groups, but enjoy a higher priority. A maximum of five concurrent synchronization tasks are allowed for your account per region.
Object list files	• An object list file cannot exceed 1,024 MB. • An object list file must be a .txt file, and its metadata **ContentType** must be **text/plain**. • An object list file must be in UTF-8 without BOM. • Each line in an object list file can contain only one object name, and the object name must be URL-encoded. • Spaces are not allowed in each line in an object list file. Spaces may cause migration failures because they may be mistakenly identified as object names. • Each line in an object list file cannot be longer than 65,535 characters, or the migration will fail. • The **ContentEncoding** metadata of an object list file must be left empty, or the migration will fail.

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Item	Description
URL list files	• A URL list file cannot exceed 1,024 MB. • A URL list file must be a .txt file, and its metadata **ContentType** must be **text/plain**. • A URL list file must be in UTF-8 without BOM. • Each line in a URL list file can contain only one URL and one destination object name. • Each line in a URL list file cannot be longer than 65,535 characters, or the migration will fail. • The **ContentEncoding** metadata of a URL list file must be left empty, or the migration will fail. • Spaces are not allowed in each line in a URL list file. Spaces may cause migration failures because they may be mistakenly identified as object names. • In a URL list file, you must use a tab character (\t) to separate the URL and destination object name in each line. The format is **[***URL***][***Tab character***][***Destination object name***]**. Chinese and special characters in the source and destination object names must be URL-encoded. For example: http://xxx.xxx.xxx.xxx.com/doc/%e6%96%87%e4%bb%b61.txt doc/%e6%96%87%e4%bb%b61.txt http://xxx.xxx.xxx.xxx.com/doc/thefile2.txt doc/thefile2.txt http://xxx.xxx.xxx.xxx.com/the%20file.txt the%20file.txt http://xxx.xxx.xxx.xxx.com/the%20file2.txt the+file2.txt http://xxx.xxx.xxx.xxx.com/doc/thefile.txt doc/thefile.txt In the preceding example, after the files represented by the URLs are copied to the destination bucket, the objects are named **doc/***File 1***.txt**, **doc/thefile2.txt**, **the file.txt**, **the file2.txt**, and **doc/thefile.txt**. The URL encoding must start from the second character after the domain name in a line. Do not encode the protocol header, domain name, or slash before or after the domain name. Otherwise, the format verification will fail. In each line, use a tab character (Tab key on the keyboard) to separate the URL and the destination object name. Do not use spaces. • URLs in a list file can be accessed using HEAD and GET methods.

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Item	Description
Failed object list files	A maximum of 100,000 failed objects can be recorded in a list file. **NOTE** If more than 100,000 objects fail to be migrated in a migration task, you are advised to rectify the fault based on the existing failed object list and perform the migration again.

Billing for Same-Region Replication Within an Account

- When you use the OMS console or APIs to migrate data, OBS APIs of the source and destination ends are invoked to upload and download data. You will be billed for the API requests and data download traffic. For details, see **OMS Billing**. In addition, you will be billed for storing the objects in the destination bucket. For details, see **Storage Costs**.
- When you use OBS APIs, SDKs, Browser+, or obsutil to replicate data within the same region, you will be billed for requests and storage. For details, see **Table 8-48**.

Table 8-48 Billing for data replication in the same region

Action	Billing Item	Description	Billing Mode
Replicate data in the same region	Requests	You are billed for the number of successfully replicated objects. Successfully replicating one object creates a copy request. For details, see **Copying Objects**. To learn about the request billing, see **Requests**.	Pay-per-use
	Data transfer	Free, because data in the same region is replicated over an intranet.	N/A
	Storage space	Storage space occupied by objects stored in the destination bucket. If you have specified another storage class for object copies in the destination bucket, these copies are billed based on the new storage class.	Pay-per-use Resource packages

Prerequisites

- A source bucket has been created in a region of an account.
- A destination bucket has been created in the same region of the same account. To create a bucket, see **Creating a Bucket**.

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Same-Region Replication Within an Account

You can use the OMS console or APIs to migrate data within the same account and region or use OBS APIs, SDKs, or obsutil to replicate data within the same account and region.

NOTICE

OMS does not automatically migrate data. That is, data changes in the source bucket will not be automatically synchronized to the destination bucket. After data in the source bucket is modified, you need to execute the migration task again to synchronize the incremental data in the source bucket to the destination bucket.

Using the OMS Console

Use the OMS console to migrate data in OBS buckets. For details, see **Migration Process**.

NOTE

- If the data volume of a single bucket does not exceed 3 TB or there are no more than 5 million objects, you can **create a migration task** to migrate data.
- If the data volume of a single bucket is greater than 3 TB or there are more than 5 million objects, you can **create a migration task group** to migrate data.

Using APIs

- **Using OMS APIs**
  - **Creating a Migration Task**
  - **Creating a Migration Task Group**
- **Using OBS APIs**
  - To replicate an object that is **between 0 bytes and 5 GB in size**, see **Copying an Object**.
  - To replicate an object **larger than 5 GB**, you can only **copy some parts of the object**.

Using OBS SDKs

- To replicate an object that is **between 0 bytes and 5 GB in size**, refer to the following table.

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

- To replicate an object **larger than 5 GB**, you can only **copy parts using multipart upload**.

Using the GUI Tool - OBS Browser+

Constraints

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- Files or folders in external buckets cannot be copied.
- The restore status of Archive objects cannot be copied.
- The source path and target path must be different.

Procedure

Step 1 Log in to OBS Browser+.

Step 2 Go to the target bucket. Right-click the file or folder and choose **Copy** from the shortcut menu.

Step 3 Right-click the path for saving the file or folder and choose **Paste** from the shortcut menu.

----End

Using the CLI Tool - obsutil

To use obsutil to replicate objects within the same account and region, do not enable the cross-region replication mode, that is, do not configure the **crr** parameter.

NOTICE

- Do not change the source objects in the OBS bucket when copying a single object or objects in batches. Otherwise, the operation may fail or data may be inconsistent.
- If the storage class of the object to be copied is **cold**, you must restore the object to be copied first. Otherwise, the copy fails.
- To copy objects, you must have the read permission on the objects to be copied and the write permission on the destination bucket.
- If the client-side cross-region replication function is not enabled, ensure that the source bucket and destination bucket are in the same region.
- If the source bucket is a parallel file system (supporting POSIX), the destination bucket must also be a parallel file system.

Constraints

- The source path and destination path cannot be the same.
- The source path and destination path cannot be overlapped either.
  - If the source path overlaps with the prefix of the destination path, recursive replication applies.
  - If the destination path overlaps with the prefix of the source path, the replication may overwrite objects in the source path.

Command Line Structure

- In Windows
  - Copying a single object

```
obsutil cp obs://srcbucket/key obs://dstbucket/[dest] [-dryRun][-u] [-crr] [-vlength] [-vmd5] [-p=1] [-threshold=52428800] [-versionId=xxx] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

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  - Copying objects in batches

```
obsutil cp obs://srcbucket[/key] obs://dstbucket[/dest] -r [-dryRun][-f] [-flat] [-u] [-crr] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

- In Linux or macOS
  - Copying a single object

```
./obsutil cp obs://srcbucket/key obs://dstbucket/[dest] [-dryRun] [-u] [-crr] [-vlength] [-vmd5] [-p=1] [-threshold=52428800] [-versionId=xxx] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

  - Copying objects in batches

```
./obsutil cp obs://srcbucket[/key] obs://dstbucket[/dest] -r [-dryRun] [-f] [-flat] [-u] [-crr] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

Examples

- Take the Windows OS as an example. Run the **obsutil cp obs://bucket-test/key obs://bucket-test2** command to copy a single object.

```
obsutil cp obs://bucket-test/key obs://bucket-test2
Start at 2024-09-30 08:30:09.0815415 +0000 UTC

Parallel:      3                Jobs:          3
Threshold:     50.00MB          PartSize:      auto
CheckpointDir: xxxx

[=====================================================] 100.00% 6/s 0s
Waiting for the copied key to be completed on server side.
Copy successfully, 19B, obs://bucket-test/key --> obs://bucket-test2/key
ext.txt, cost [1708], status [200], request id [00000192420D227E4017336A12F1DC22]
```

- Take the Windows OS as an example. Run the **obsutil cp obs://bucket-test/temp/ obs://bucket-test2 -f -r** command to copy objects in batches.

```
obsutil cp obs://bucket-test/temp/ obs://bucket-test2 -r -f
Start at 2024-09-30 08:34:02.7819703 +0000 UTC

Parallel:      5                Jobs:          5
Threshold:     50.00MB          PartSize:      auto
CheckpointDir: xxxx

Task id: 0476929d-9d23-4dc5-b2f8-0a0493f027c5
OutputDir: xxxx

[=============================================================] 100.00% 10/s 0s
Succeed count:   5        Failed count:    0
Metrics [max cost:298 ms, min cost:192 ms, average cost:238.00 ms, average tps:9.71, transferred size: 7.20MB]
Task id: 0476929d-9d23-4dc5-b2f8-0a0493f027c5
```

- For more examples, see **Common Examples**.

Parameter Description

Parameter	Optional or Mandatory	Description
srcbucket	Mandatory	The source bucket name
dstbucket	Mandatory	The destination bucket name
dest	Optional	The destination object name when copying an object, or the name prefix of destination objects when copying objects in batches

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Parameter	Optional or Mandatory	Description
key	Mandatory for copying an object. Optional for copying objects in batches.	The source object name when copying an object, or the name prefix of source objects when copying objects in batches The rules are as follows: • This parameter cannot be left blank when copying an object. – If **dest** is left blank, the source object is copied to the root directory of the destination bucket. – If the value of **dest** ends with a slash (/), the destination object name is the value of **dest** plus the source object name. Otherwise, the destination object name is the value of **dest**. • If this parameter is left blank when copying objects in batches, all objects in the source bucket are copied. If not, objects whose name prefix is the set value in the source bucket are copied. The rules for confirming the name of the destination object are as follows: – If the value of **dest** ends with a slash (/), the destination object name is the value of **dest** plus the source object name. – If the value of **dest** does not end with a slash (/), the destination object name is *the value of **dest**/source object name*. • If this parameter is configured but the **flat** parameter is not when copying objects in batches, the name of the source object contains the name prefix of the parent object. If **flat** is configured, then the name of the source object does not contain the name prefix of the parent object. **NOTE** For details about how to use this parameter, see **Copy**.
fr	Optional for copying an object (additional parameter)	Generates an operation result file when copying an object.
flat	Optional for copying objects in batches (additional parameter)	The name prefix of the parent object is excluded when copying objects in batches.

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Parameter	Optional or Mandatory	Description
dryRun	Optional (additional parameter)	Conducts a dry run.
crr	Do not set this parameter for same-region replication within an account.	Enables the client-side cross-region replication function. In this mode, data is directly copied to the destination bucket from the source bucket through data stream. The buckets can be any two OBS buckets. • If this parameter is configured, the configuration of client-side cross-region replication must be updated in the configuration file. For details, see **Updating a Configuration File**. • When cross-region replication is enabled, the upload/download bandwidth, CPU, and memory resources of the host where commands are executed will be occupied, which may deteriorate the host performance. **NOTE** The configurations of the source bucket and destination bucket are respectively **akCrr/skCrr/tokenCrr/endpointCrr** and **ak/sk/token/endpoint** in the configuration file.
vlength	Optional (additional parameter)	Verifies whether the object size in the destination bucket is the same as that in the source bucket after the copy task completes. **This parameter must be used together with crr.**
vmd5	Optional (additional parameter)	Verifies whether the MD5 value of the destination bucket is the same as that of the source bucket after the copy task completes. • **This parameter must be used together with crr.** • **Objects in the source bucket must contain metadata x-obs-meta-md5chksum, or MD5 verification will be skipped.** After the MD5 verification is successful, this parameter value is used for metadata **x-obs-meta-md5chksum** of the destination object, for later MD5 verification during download or replication. • **If your object needs encryption, do not use this parameter.**

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Parameter	Optional or Mandatory	Description
u	Optional (additional parameter)	Indicates incremental copy. If this parameter is set, each object can be copied only when it does not exist in the destination bucket, its size is different from the namesake one in the destination bucket, or it has the latest modification time.
p	Optional (additional parameter)	The maximum number of concurrent multipart copy tasks when copying an object. The default value is the value of **defaultParallels** in the configuration file.
threshold	Optional (additional parameter)	The threshold for enabling multipart copy. If the size of the object to be copied is smaller than the threshold, copy the object directly. If not, a multipart copy is required. The default value is the value of **defaultBigfileThreshold** in the configuration file. Unit: byte This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes). **NOTE** If you copy an object directly, no part record is generated, and resumable transmission is not supported.
versionId	Optional for copying an object (additional parameter)	The source object version ID that can be specified when copying an object
acl	Optional (additional parameter)	The access control policies for destination objects that can be specified when copying objects. Possible values are: • **private**: Only users granted permissions by the object ACL can access the object. • **public-read**: Anyone can read objects in the bucket. • **public-read-write**: Anyone can read, write, or delete objects in the bucket. • **bucket-owner-full-control**: Only the bucket owner has full control over objects in the bucket.

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Parameter	Optional or Mandatory	Description
sc	Optional (additional parameter)	The storage classes of the destination objects that can be specified when copying objects. Possible values are: • **standard**: The Standard storage class. It features low access latency and high throughput, and is suitable for storing frequently accessed data (multiple times per month on average) or data that is smaller than 1 MB. • **warm**: The Infrequent Access storage class. It is suitable for storing infrequently accessed (less than 12 times per year on average) data, but when needed, the access has to be fast. It has a slightly lower availability than Standard. • **cold**: The Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once per year on average) data. • **deep-archive**: The Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely accessed (once every few years on average). This storage class costs less than the Archive storage class, but takes longer (usually several hours) to restore data.
meta	Optional (additional parameter)	The standard or user-defined metadata that can be specified during object replication. • Standard metadata includes **Content-Type**, **Content-Encoding**, **Cache-Control**, **Content-Disposition**, **Content-Language** and **Expires**. • User-defined metadata must be in the format of *key:value*. Multiple user-defined metadata items are separated by number signs (#), for example, *key1:value1*#*key2:value2*#*key3:value3*, which indicates that the object copy in the destination bucket contains three groups of user-defined metadata: *key1:value1*, *key2:value2*, and *key3:value3*.

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Parameter	Optional or Mandatory	Description
fs	Optional (additional parameter)	Specifies whether the method of listing parallel file systems is applied. If you are listing parallel file systems, you are recommended to add this parameter. ● After this parameter is enabled, **marker** and **limit** will be ignored. Then, the size of the bucket, parallel file system, or directory will be calculated. ● This parameter is only supported for obsutil 5.5.12 or later. ● With this method, the listing time required varies largely depending on the directory structures.
ps	Optional (additional parameter)	The size of each part in a multipart copy task ● The default value is the value of **defaultPartSize** in the configuration file. The parameter can be set to **auto**. In this case, obsutil automatically configures the part size for each multipart task based on the source file size. ● Range: **100KB** to **5GB** ● Unit: byte. This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes).
cpd	Optional (additional parameter)	The folder where the part records reside. The default value is **.obsutil_checkpoint**, the subfolder in the home directory of the user who executes obsutil commands. A part record is generated during a multipart copy and saved to the **upload** subfolder. After the copy succeeds, its part record is deleted automatically. If the copy fails or is suspended, the system attempts to resume the task according to its part record when you perform the copy the next time.
r	Mandatory for copying objects in batches (additional parameter)	Copies objects in batches based on a specified name prefix of objects in the source bucket.

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Parameter	Optional or Mandatory	Description
f	Optional for copying objects in batches (additional parameter)	Runs in force mode.
j	Optional for copying objects in batches (additional parameter)	The maximum number of concurrent tasks for copying objects in batches. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.

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Parameter	Optional or Mandatory	Description
exclude	Optional for copying objects in batches (additional parameter)	The matching patterns of source objects that are excluded. After this parameter is specified, if the name of the object to be copied matches the value of this parameter, the object is skipped. For example, if this parameter is set to ***.txt**, all files whose names end with **.txt** are skipped and not copied. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent ***** and **\?** to represent **?**. ● Multiple **exclude** parameters can be specified, for example, **-exclude=*.xxx -exclude=*.xxx**. **Restrictions**: This matching pattern applies only to objects whose names do not end with a slash (/). **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute path of an object, including the object name prefix and object name starting from the root directory. For example, if the path of an object in the bucket is **obs://bucket/src1/src2/test.txt**, then the absolute path of the object is **src1/src2/test.txt**.

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Parameter	Optional or Mandatory	Description
include	Optional for copying objects in batches (additional parameter)	The included matching patterns of source objects. After this parameter is specified, if the name of the object to be copied matches the value of this parameter, the object is copied. For example, if this parameter is set to ***.txt**, all objects whose names end with **.txt** are copied. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent ***** and **\?** to represent **?**. ● Multiple **include** parameters can be specified, for example, **-include=*.xxx -include=*.xxx**. **Restrictions**: ● This matching pattern applies only to objects whose names do not end with a slash (/). ● If both the **exclude** and **include** parameters are configured, the **exclude** rules are applied first. If the name of an object to be copied does not match **exclude**, OBS checks whether the object name matches the value of **include**. If yes, the object is copied. If no, the object is skipped. **Example**: ./obsutil cp obs://src-bucket/ obs://target-bucket/ -include=/src-object/* -f -r This command copies files whose names start with **src-object/** from the **src-bucket** bucket to the **target-bucket** bucket. **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute path of an object, including the object name prefix and object name starting from the root directory. For example, if the path of an object in the bucket is **obs://bucket/src1/src2/test.txt**, then the absolute path of the object is **src1/src2/test.txt**.

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Parameter	Optional or Mandatory	Description
timeRange	Optional for copying objects in batches (additional parameter)	The time range matching pattern when copying objects. Only objects whose latest modification time is within the configured time range are copied. This pattern has a lower priority than the file matching patterns (**exclude**/**include**). That is, the time range matching pattern is executed after the configured file matching patterns. ● Time in the matching pattern is the UTC time. ● The matching time range is represented in *time1*-*time2*, where *time1* must be earlier than or the same as *time2*. The time format is *yyyyMMddHHmmss*. ● Automatic formatting is supported. For example, *yyyyMMdd* is equivalent to *yyyyMMdd***000000**, and *yyyyMM* is equivalent to *yyyyMM***01000000**. ● If this parameter is set to ***-***time2*, all files whose last modification time is earlier than *time2* are matched. If it is set to *time1*-*, all files whose last modification time is later than *time1* are matched. **This matching pattern applies only to objects whose names do not end with a slash (/).**
mf	Optional (additional parameter)	Indicates that the name matching pattern (**include** or **exclude**) and the time matching pattern (**timeRange**) also take effect on objects whose names end with a slash (/).

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Parameter	Optional or Mandatory	Description
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (possibly success, failure, and warning files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. • A result file should be named as follows: **cp_{succeed | failed | warning}_report**_*time*_*TaskId*.**txt**. • By default, the maximum size of a single result file is 30 MB. You can set the maximum size by configuring **recordMaxLogSize** in the configuration file. • By default, the maximum number of result files that can be retained is 1,024. You can set the maximum number by configuring **recordBackups** in the configuration file. • If there are multiple folders and files and you need to confirm the details of a failed task, refer to the failure result file **cp_failed_report**_*time*_*TaskId*.**txt** in the result folder and the **log files** in the log path.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. To learn the parameters that can be configured in this file, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Response

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Field	Description
Parallel	The parameter **-p** in the request
Jobs	The parameter **-j** in the request
Threshold	The parameter **-threshold** in the request
PartSize	The parameter **-ps** in the request
Exclude	The parameter **-exclude** in the request
Include	The parameter **-include** in the request
TimeRange	The parameter **-timeRange** in the request
VerifyLength	The parameter **-vlength** in the request
VerifyMd5	The parameter **-vmd5** in the request
CheckpointDir	The parameter **-cpd** in the request
OutputDir	The parameter **-o** in the request
ArcDir	The parameter **-arcDir** in the request
Succeed count	The number of successful tasks
Failed count	The number of failed tasks
Skip count	The number of tasks that are skipped during incremental upload, download, or copy, and synchronous upload, download, or copy. **NOTE** Skipped tasks are recorded into successful tasks.
Warning count	The number of tasks that are executed successfully but contain warnings. **NOTE** • The task for which a warning is generated may be a failure or a success, which needs to be further determined according to the corresponding result list. • The number of tasks that generate warnings is independent of the number of successful or failed tasks. The total number of tasks is the number of successful tasks plus the number of failed tasks.
Succeed bytes	The number of bytes that are successfully uploaded or downloaded.
max cost	The maximum duration of all tasks, in ms
min cost	The minimum duration of all tasks, in ms
average cost	The average duration of all tasks, in ms
average tps	The average number of tasks completed per second
Task id	The unique ID of an operation, which is used to search for the result file generated for a batch task

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8.7.5 Same-Region Replication Across Accounts Using OMS

Scenarios

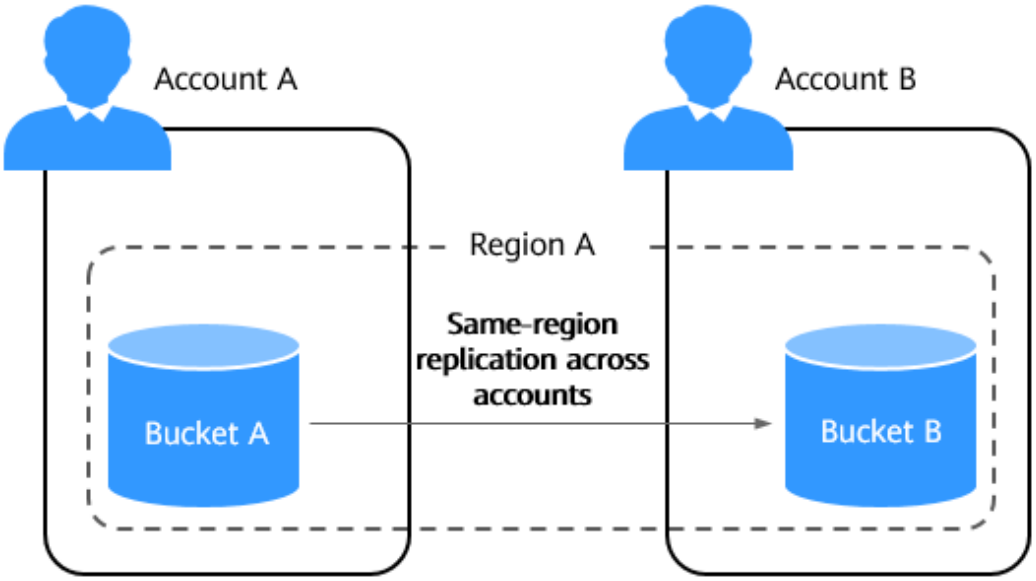
Same-region replication across accounts is to replicate data from a source bucket in one region of an account to a destination bucket in the same region of another account.

This section describes how to replicate data between buckets in the same region across accounts using OMS console, OMS APIs, OBS APIs, OBS SDKs, OBS Browser +, and obsutil.

Replication scope: files/folders, object lists, object prefixes, URL lists, and objects modified after a specified time

Replicable object data: object content, metadata (object name, size, last modification time, creator, version number, and user-defined metadata), ACL (supported by OBS APIs and obsutil), WORM retention policy (supported by OBS APIs), object tag (supported by OBS APIs), and storage class

Figure 8-31 Same-region replication across accounts



NOTICE

OBS helps you replicate your service data stored in OBS to another bucket in the same region, but Huawei Cloud has no access to your data. You need to ensure the legal compliance of your use of OBS on your own.

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Constraints

The following are constraints on migrating data using **Object Storage Migration Service (OMS)**:

Table 8-49 OMS constraints

Item	Description
Objects with multiple versions	By default, OMS migrates only the latest version of objects in source buckets.
Storage class of destination buckets	The storage class of destination buckets can be Standard, Infrequent Access, Archive, or Deep Archive.
Migration network	Migrations over the Internet or intranets are supported. Migrations over private lines are not supported.
Metadata migration	Only Chinese characters, English characters, digits, and hyphens (-) can be migrated. Other characters cannot be migrated. Chinese punctuation marks cannot be URL-encoded during the migration. If metadata contains Chinese punctuation marks, the metadata and the corresponding object will fail to be migrated. • Chinese characters are URL-encoded during the migration. • English characters, digits, and hyphens (-) are directly migrated without being encoded.
Migration scope	A single migration task or migration task group can only migrate data of one bucket. If data of multiple buckets needs to be migrated, you need to create multiple tasks or task groups.
Symbolic links	Symbolic link files cannot be migrated. Symbolic link files will be recorded as failed, and the migration task will also be marked as failed. Other files can be migrated normally. If the source contains symbolic links, you need to enter the actual file path.
Migration of object ACLs	OMS cannot migrate object ACLs.

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Item	Description
Migration speed	Generally, OMS can migrate 10 TB to 20 TB of data per day. For higher migration efficiency, you are advised to use **storage migration workflows** on MgC. MgC allows you to migrate data using dedicated, scalable migration clusters and up to 20 Gbit/s of bandwidth. However, the speed depends on the number and size of source objects, bandwidth, and transmission distance over the Internet between the source and destination buckets. You are advised to create a migration task to test the migration speed. The maximum migration speed is five times the average speed of a single task because up to five tasks can be executed concurrently in a region by default. If you need to define a higher number of concurrent tasks, you can **create a storage migration workflow** on MgC.
Archived data	You need to restore archived data before the migration. Note that when there is archived data to be migrated, you need to: • Create migration tasks after the restoration is complete. • Configure a validity period for restored data based on the total amount of data to be migrated. This helps prevent migration failures because restored data becomes archived again during the migration. • Pay your source cloud vendor for restoring archived data. To learn about the pricing details, contact your source cloud vendor.
Migration tasks	A maximum of five concurrent migration tasks are allowed for your account per region. **NOTE** If your destination regions are CN North-Beijing1 and CN South-Guangzhou, you can run up to 10 migration tasks concurrently.
	A maximum of 1,000,000 migration tasks can be created in your account per region within a 24-hour period.
Migration Task Groups	A maximum of five concurrent migration task groups are allowed for your account per region. **NOTE** If your destination regions are CN North-Beijing1 and CN South-Guangzhou, you can run up to 10 migration task groups concurrently.

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Item	Description
Synchronization tasks	Synchronization tasks share quotas with migration tasks and migration task groups, but enjoy a higher priority. A maximum of five concurrent synchronization tasks are allowed for your account per region.
Object list files	• An object list file cannot exceed 1,024 MB. • An object list file must be a .txt file, and its metadata **ContentType** must be **text/plain**. • An object list file must be in UTF-8 without BOM. • Each line in an object list file can contain only one object name, and the object name must be URL-encoded. • Spaces are not allowed in each line in an object list file. Spaces may cause migration failures because they may be mistakenly identified as object names. • Each line in an object list file cannot be longer than 65,535 characters, or the migration will fail. • The **ContentEncoding** metadata of an object list file must be left empty, or the migration will fail.

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Item	Description
URL list files	• A URL list file cannot exceed 1,024 MB. • A URL list file must be a .txt file, and its metadata **ContentType** must be **text/plain**. • A URL list file must be in UTF-8 without BOM. • Each line in a URL list file can contain only one URL and one destination object name. • Each line in a URL list file cannot be longer than 65,535 characters, or the migration will fail. • The **ContentEncoding** metadata of a URL list file must be left empty, or the migration will fail. • Spaces are not allowed in each line in a URL list file. Spaces may cause migration failures because they may be mistakenly identified as object names. • In a URL list file, you must use a tab character (\t) to separate the URL and destination object name in each line. The format is **[***URL***][***Tab character***][***Destination object name***]**. Chinese and special characters in the source and destination object names must be URL-encoded. For example: http://xxx.xxx.xxx.xxx.com/doc/%e6%96%87%e4%bb%b61.txt doc/%e6%96%87%e4%bb%b61.txt http://xxx.xxx.xxx.xxx.com/doc/thefile2.txt doc/thefile2.txt http://xxx.xxx.xxx.xxx.com/the%20file.txt the%20file.txt http://xxx.xxx.xxx.xxx.com/the%20file2.txt the+file2.txt http://xxx.xxx.xxx.xxx.com/doc/thefile.txt doc/thefile.txt In the preceding example, after the files represented by the URLs are copied to the destination bucket, the objects are named **doc/***File 1***.txt**, **doc/thefile2.txt**, **the file.txt**, **the file2.txt**, and **doc/thefile.txt**. The URL encoding must start from the second character after the domain name in a line. Do not encode the protocol header, domain name, or slash before or after the domain name. Otherwise, the format verification will fail. In each line, use a tab character (Tab key on the keyboard) to separate the URL and the destination object name. Do not use spaces. • URLs in a list file can be accessed using HEAD and GET methods.

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Item	Description
Failed object list files	A maximum of 100,000 failed objects can be recorded in a list file. **NOTE** If more than 100,000 objects fail to be migrated in a migration task, you are advised to rectify the fault based on the existing failed object list and perform the migration again.

Billing for Same-Region Replication Across Accounts

- When you use the OMS console or APIs to migrate data, OBS APIs of the source and destination ends are invoked to upload and download data. You will be billed for the API requests and data download traffic. For details, see **OMS Billing**. In addition, you will be billed for storing the objects in the destination bucket. For details, see **Storage Costs**.
- When you use OBS APIs, SDKs, Browser+, or obsutil to replicate data within the same region, you will be billed for requests and storage. For details, see **Table 8-50**.

Table 8-50 Billing for data replication in the same region

Action	Billing Item	Description	Billing Mode
Replicate data in the same region	Requests	You are billed for the number of successfully replicated objects. Successfully replicating one object creates a copy request. For details, see **Copying Objects**. To learn about the request billing, see **Requests**.	Pay-per-use
	Data transfer	Free, because data in the same region is replicated over an intranet.	N/A
	Storage space	Storage space occupied by objects stored in the destination bucket. If you have specified another storage class for object copies in the destination bucket, these copies are billed based on the new storage class.	Pay-per-use Resource packages

Prerequisites

- A source bucket has been created in a region of an account.
- A destination bucket has been created in the same region of another account. To create a bucket, see **Creating a Bucket**.

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Same-Region Replication Across Accounts

You can use the OMS console or APIs to migrate data across accounts in the same region or use OBS APIs, SDKs, and obsutil to replicate data across accounts in the same region.

NOTICE

OMS does not automatically migrate data. That is, data changes in the source bucket will not be automatically synchronized to the destination bucket. After data in the source bucket is modified, you need to execute the migration task again to synchronize the incremental data in the source bucket to the destination bucket.

Using the OMS Console

Use the OMS console to migrate data in OBS buckets. For details, see **Migration Process**.

NOTE

- If the data volume of a single bucket does not exceed 3 TB or there are no more than 5 million objects, you can **create a migration task** to migrate data.
- If the data volume of a single bucket is greater than 3 TB or there are more than 5 million objects, you can **create a migration task group** to migrate data.

Using APIs

- **Using OMS APIs**:
  - **Creating a Migration Task**
  - **Creating a Migration Task Group**
- **Using OBS APIs**:
  - To replicate an object that is **between 0 bytes and 5 GB in size**, see **Copying an Object**.
  - To replicate an object **larger than 5 GB**, you can only **copy some parts of the object**.

Using OBS SDKs

- To replicate an object that is **between 0 bytes and 5 GB in size**, refer to the following table.

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

- To replicate an object **larger than 5 GB**, you can only **copy parts using multipart upload**.

Using the GUI Tool - OBS Browser+

Constraints

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- Files or folders in external buckets cannot be copied.
- The restore status of Archive objects cannot be copied.
- The source path and target path must be different.

Procedure

Step 1 Log in to OBS Browser+.

Step 2 Go to the target bucket. Right-click the file or folder and choose **Copy** from the shortcut menu.

Step 3 Right-click the path for saving the file or folder and choose **Paste** from the shortcut menu.

----End

Using the CLI Tool - obsutil

To use obsutil to replicate objects across accounts in the same region, do not enable the cross-region replication mode, that is, do not configure the **crr** parameter.

NOTICE

- Do not change the source objects in the OBS bucket when copying a single object or objects in batches. Otherwise, the operation may fail or data may be inconsistent.
- If the storage class of the object to be copied is **cold**, you must restore the object to be copied first. Otherwise, the copy fails.
- To copy objects, you must have the read permission on the objects to be copied and the write permission on the destination bucket.
- If the client-side cross-region replication function is not enabled, ensure that the source bucket and destination bucket are in the same region.
- If the source bucket is a parallel file system (supporting POSIX), the destination bucket must also be a parallel file system.

Constraints

- The source path and destination path cannot be the same.
- The source path and destination path cannot be overlapped either.
  - If the source path overlaps with the prefix of the destination path, recursive replication applies.
  - If the destination path overlaps with the prefix of the source path, the replication may overwrite objects in the source path.

Command Line Structure

- In Windows
  - Copying a single object

```
obsutil cp obs://srcbucket/key obs://dstbucket/[dest] [-dryRun][-u] [-crr] [-vlength] [-vmd5] [-p=1] [-threshold=52428800] [-versionId=xxx] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
```

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  - Copying objects in batches
    ```
    obsutil cp obs://srcbucket[/key] obs://dstbucket[/dest] -r [-dryRun][-f] [-flat] [-u] [-crr] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

- In Linux or macOS
  - Copying a single object
    ```
    ./obsutil cp obs://srcbucket/key obs://dstbucket/[dest] [-dryRun] [-u] [-crr] [-vlength] [-vmd5] [-p=1] [-threshold=52428800] [-versionId=xxx] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-cpd=xxx] [-fr] [-o=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```
  - Copying objects in batches
    ```
    ./obsutil cp obs://srcbucket[/key] obs://dstbucket[/dest] -r [-dryRun] [-f] [-flat] [-u] [-crr] [-vlength] [-vmd5] [-j=1] [-p=1] [-threshold=52428800] [-acl=xxx] [-sc=xxx] [-meta=aaa:bbb#ccc:ddd] [-ps=auto] [-include=*.xxx] [-exclude=*.xxx] [-timeRange=time1-time2] [-mf] [-o=xxx] [-cpd=xxx] [-config=xxx] [-e=xxx] [-i=xxx] [-k=xxx] [-t=xxx]
    ```

Examples

- Take the Windows OS as an example. Run the **obsutil cp obs://bucket-test/key obs://bucket-test2** command to copy a single object.
  ```
  obsutil cp obs://bucket-test/key obs://bucket-test2
  Start at 2024-09-30 08:30:09.0815415 +0000 UTC

  Parallel:      3                Jobs:          3
  Threshold:     50.00MB          PartSize:      auto
  CheckpointDir: xxxx

  [=====================================================] 100.00% 6/s 0s
  Waiting for the copied key to be completed on server side.
  Copy successfully, 19B, obs://bucket-test/key --> obs://bucket-test2/key
  ext.txt, cost [1708], status [200], request id [00000192420D227E4017336A12F1DC22]
  ```
- Take the Windows OS as an example. Run the **obsutil cp obs://bucket-test/temp/ obs://bucket-test2 -f -r** command to copy objects in batches.
  ```
  obsutil cp obs://bucket-test/temp/ obs://bucket-test2 -r -f
  Start at 2024-09-30 08:34:02.7819703 +0000 UTC

  Parallel:      5                Jobs:          5
  Threshold:     50.00MB          PartSize:      auto
  CheckpointDir: xxxx

  Task id: 0476929d-9d23-4dc5-b2f8-0a0493f027c5
  OutputDir: xxxx

  [============================================================] 100.00% 10/s 0s
  Succeed count:   5        Failed count:    0
  Metrics [max cost:298 ms, min cost:192 ms, average cost:238.00 ms, average tps:9.71, transferred size: 7.20MB]
  Task id: 0476929d-9d23-4dc5-b2f8-0a0493f027c5
  ```
- For more examples, see **Common Examples**.

Parameter Description

Parameter	Optional or Mandatory	Description
srcbucket	Mandatory	The source bucket name
dstbucket	Mandatory	The destination bucket name
dest	Optional	The destination object name when copying an object, or the name prefix of destination objects when copying objects in batches

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Parameter	Optional or Mandatory	Description
key	Mandatory for copying an object. Optional for copying objects in batches.	The source object name when copying an object, or the name prefix of source objects when copying objects in batches The rules are as follows: • This parameter cannot be left blank when copying an object. – If **dest** is left blank, the source object is copied to the root directory of the destination bucket. – If the value of **dest** ends with a slash (/), the destination object name is the value of **dest** plus the source object name. Otherwise, the destination object name is the value of **dest**. • If this parameter is left blank when copying objects in batches, all objects in the source bucket are copied. If not, objects whose name prefix is the set value in the source bucket are copied. The rules for confirming the name of the destination object are as follows: – If the value of **dest** ends with a slash (/), the destination object name is the value of **dest** plus the source object name. – If the value of **dest** does not end with a slash (/), the destination object name is *the value of* ***dest****/source object name*. • If this parameter is configured but the **flat** parameter is not when copying objects in batches, the name of the source object contains the name prefix of the parent object. If **flat** is configured, then the name of the source object does not contain the name prefix of the parent object. **NOTE** For details about how to use this parameter, see **Copy**.
fr	Optional for copying an object (additional parameter)	Generates an operation result file when copying an object.
flat	Optional for copying objects in batches (additional parameter)	The name prefix of the parent object is excluded when copying objects in batches.

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Parameter	Optional or Mandatory	Description
dryRun	Optional (additional parameter)	Conducts a dry run.
crr	Do not set this parameter for same-region replication across accounts.	Enables the client-side cross-region replication function. In this mode, data is directly copied to the destination bucket from the source bucket through data stream. The buckets can be any two OBS buckets. • If this parameter is configured, the configuration of client-side cross-region replication must be updated in the configuration file. For details, see **Updating a Configuration File**. • When cross-region replication is enabled, the upload/download bandwidth, CPU, and memory resources of the host where commands are executed will be occupied, which may deteriorate the host performance. **NOTE** The configurations of the source bucket and destination bucket are respectively **akCrr/skCrr/tokenCrr/endpointCrr** and **ak/sk/token/endpoint** in the configuration file.
vlength	Optional (additional parameter)	Verifies whether the object size in the destination bucket is the same as that in the source bucket after the copy task completes. **This parameter must be used together with crr.**
vmd5	Optional (additional parameter)	Verifies whether the MD5 value of the destination bucket is the same as that of the source bucket after the copy task completes. • **This parameter must be used together with crr.** • **Objects in the source bucket must contain metadata x-obs-meta-md5chksum, or MD5 verification will be skipped.** After the MD5 verification is successful, this parameter value is used for metadata **x-obs-meta-md5chksum** of the destination object, for later MD5 verification during download or replication. • **If your object needs encryption, do not use this parameter.**

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Parameter	Optional or Mandatory	Description
u	Optional (additional parameter)	Indicates incremental copy. If this parameter is set, each object can be copied only when it does not exist in the destination bucket, its size is different from the namesake one in the destination bucket, or it has the latest modification time.
p	Optional (additional parameter)	The maximum number of concurrent multipart copy tasks when copying an object. The default value is the value of **defaultParallels** in the configuration file.
threshold	Optional (additional parameter)	The threshold for enabling multipart copy. If the size of the object to be copied is smaller than the threshold, copy the object directly. If not, a multipart copy is required. The default value is the value of **defaultBigfileThreshold** in the configuration file. Unit: byte This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes). **NOTE** If you copy an object directly, no part record is generated, and resumable transmission is not supported.
versionId	Optional for copying an object (additional parameter)	The source object version ID that can be specified when copying an object
acl	Optional (additional parameter)	The access control policies for destination objects that can be specified when copying objects. Possible values are: • **private**: Only users granted permissions by the object ACL can access the object. • **public-read**: Anyone can read objects in the bucket. • **public-read-write**: Anyone can read, write, or delete objects in the bucket. • **bucket-owner-full-control**: Only the bucket owner has full control over objects in the bucket.

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Parameter	Optional or Mandatory	Description
sc	Optional (additional parameter)	The storage classes of the destination objects that can be specified when copying objects. Possible values are: • **standard**: The Standard storage class. It features low access latency and high throughput, and is suitable for storing frequently accessed data (multiple times per month on average) or data that is smaller than 1 MB. • **warm**: The Infrequent Access storage class. It is suitable for storing infrequently accessed (less than 12 times per year on average) data, but when needed, the access has to be fast. It has a slightly lower availability than Standard. • **cold**: The Archive storage class. It provides secure, durable, and inexpensive storage for rarely-accessed (once per year on average) data. • **deep-archive**: The Deep Archive storage class (under limited beta testing). It is suitable for storing data that is barely accessed (once every few years on average). This storage class costs less than the Archive storage class, but takes longer (usually several hours) to restore data.
meta	Optional (additional parameter)	The standard or user-defined metadata that can be specified during object replication. • Standard metadata includes **Content-Type**, **Content-Encoding**, **Cache-Control**, **Content-Disposition**, **Content-Language** and **Expires**. • User-defined metadata must be in the format of *key:value*. Multiple user-defined metadata items are separated by number signs (#), for example, *key1:value1*#*key2:value2*#*key3:value3*, which indicates that the object copy in the destination bucket contains three groups of user-defined metadata: *key1:value1*, *key2:value2*, and *key3:value3*.

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Parameter	Optional or Mandatory	Description
fs	Optional (additional parameter)	Specifies whether the method of listing parallel file systems is applied. If you are listing parallel file systems, you are recommended to add this parameter. ● After this parameter is enabled, **marker** and **limit** will be ignored. Then, the size of the bucket, parallel file system, or directory will be calculated. ● This parameter is only supported for obsutil 5.5.12 or later. ● With this method, the listing time required varies largely depending on the directory structures.
ps	Optional (additional parameter)	The size of each part in a multipart copy task ● The default value is the value of **defaultPartSize** in the configuration file. The parameter can be set to **auto**. In this case, obsutil automatically configures the part size for each multipart task based on the source file size. ● Range: **100KB** to **5GB** ● Unit: byte. This parameter value can contain a unit, for example, **1MB** (indicating 1,048,576 bytes).
cpd	Optional (additional parameter)	The folder where the part records reside. The default value is **.obsutil_checkpoint**, the subfolder in the home directory of the user who executes obsutil commands. A part record is generated during a multipart copy and saved to the **upload** subfolder. After the copy succeeds, its part record is deleted automatically. If the copy fails or is suspended, the system attempts to resume the task according to its part record when you perform the copy the next time.
r	Mandatory for copying objects in batches (additional parameter)	Copies objects in batches based on a specified name prefix of objects in the source bucket.

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Parameter	Optional or Mandatory	Description
f	Optional for copying objects in batches (additional parameter)	Runs in force mode.
j	Optional for copying objects in batches (additional parameter)	The maximum number of concurrent tasks for copying objects in batches. The default value is the value of **defaultJobs** in the configuration file. **NOTE** The value is ensured to be greater than or equal to 1.

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Parameter	Optional or Mandatory	Description
exclude	Optional for copying objects in batches (additional parameter)	The matching patterns of source objects that are excluded. After this parameter is specified, if the name of the object to be copied matches the value of this parameter, the object is skipped. For example, if this parameter is set to ***.txt**, all files whose names end with **.txt** are skipped and not copied. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent ***** and **\?** to represent **?**. ● Multiple **exclude** parameters can be specified, for example, **-exclude=*.xxx -exclude=*.xxx**. **Restrictions**: This matching pattern applies only to objects whose names do not end with a slash (/). **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute path of an object, including the object name prefix and object name starting from the root directory. For example, if the path of an object in the bucket is **obs://bucket/src1/src2/test.txt**, then the absolute path of the object is **src1/src2/test.txt**.

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Parameter	Optional or Mandatory	Description
include	Optional for copying objects in batches (additional parameter)	The included matching patterns of source objects. After this parameter is specified, if the name of the object to be copied matches the value of this parameter, the object is copied. For example, if this parameter is set to ***.txt**, all objects whose names end with **.txt** are copied. ● An asterisk (*) matches any number of characters. For instance, **abc*.txt** matches all files whose names start with **abc**, contain any number of characters in the middle, and end with **.txt**. ● A question mark (?) matches any single character. For instance, **abc?.txt** matches all files whose names start with **abc**, contain any single character in the middle, and end with **.txt**. ● You can use ***** to represent ***** and **\?** to represent **?**. ● Multiple **include** parameters can be specified, for example, **-include=*.xxx -include=*.xxx**. **Restrictions**: ● This matching pattern applies only to objects whose names do not end with a slash (/). ● If both the **exclude** and **include** parameters are configured, the **exclude** rules are applied first. If the name of an object to be copied does not match **exclude**, OBS checks whether the object name matches the value of **include**. If yes, the object is copied. If no, the object is skipped. **Example**: `./obsutil cp obs://src-bucket/ obs://target-bucket/ -include=/src-object/* -f -r` This command copies files whose names start with **src-object/** from the **src-bucket** bucket to the **target-bucket** bucket. **NOTE** ● You are advised to use quotation marks for the matching pattern to prevent special characters from being escaped by the OS and leading to unexpected results. Use single quotation marks for Linux or macOS and double quotation marks for Windows. ● The matching pattern applies to the absolute path of an object, including the object name prefix and object name starting from the root directory. For example, if the path of an object in the bucket is **obs://bucket/src1/src2/test.txt**, then the absolute path of the object is **src1/src2/test.txt**.

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Parameter	Optional or Mandatory	Description
timeRange	Optional for copying objects in batches (additional parameter)	The time range matching pattern when copying objects. Only objects whose latest modification time is within the configured time range are copied. This pattern has a lower priority than the file matching patterns (**exclude**/**include**). That is, the time range matching pattern is executed after the configured file matching patterns. ● Time in the matching pattern is the UTC time. ● The matching time range is represented in *time1*-*time2*, where *time1* must be earlier than or the same as *time2*. The time format is *yyyyMMddHHmmss*. ● Automatic formatting is supported. For example, *yyyyMMdd* is equivalent to *yyyyMMdd***000000**, and *yyyyMM* is equivalent to *yyyyMM***01000000**. ● If this parameter is set to ***-***time2*, all files whose last modification time is earlier than *time2* are matched. If it is set to *time1*-*, all files whose last modification time is later than *time1* are matched. **This matching pattern applies only to objects whose names do not end with a slash (/).**
mf	Optional (additional parameter)	Indicates that the name matching pattern (**include** or **exclude**) and the time matching pattern (**timeRange**) also take effect on objects whose names end with a slash (/).

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Parameter	Optional or Mandatory	Description
o	Optional (additional parameter)	The folder that stores the result files. After the command is executed, result files (possibly success, failure, and warning files) will be created in the specified folder. The default value is **.obsutil_output**, a subfolder in the user's home directory where obsutil commands are executed. • A result file should be named as follows: **cp_{succeed | failed | warning}_report**_*time*_*TaskId*.**txt**. • By default, the maximum size of a single result file is 30 MB. You can set the maximum size by configuring **recordMaxLogSize** in the configuration file. • By default, the maximum number of result files that can be retained is 1,024. You can set the maximum number by configuring **recordBackups** in the configuration file. • If there are multiple folders and files and you need to confirm the details of a failed task, refer to the failure result file **cp_failed_report**_*time*_*TaskId*.**txt** in the result folder and the **log files** in the log path.
config	Optional (additional parameter)	The user-defined configuration file for executing the current command. To learn the parameters that can be configured in this file, see **Configuration Parameters**.
e	Optional (additional parameter)	The endpoint
i	Optional (additional parameter)	The user's AK
k	Optional (additional parameter)	The user's SK
t	Optional (additional parameter)	The user's security token

Response

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Field	Description
Parallel	The parameter **-p** in the request
Jobs	The parameter **-j** in the request
Threshold	The parameter **-threshold** in the request
PartSize	The parameter **-ps** in the request
Exclude	The parameter **-exclude** in the request
Include	The parameter **-include** in the request
TimeRange	The parameter **-timeRange** in the request
VerifyLength	The parameter **-vlength** in the request
VerifyMd5	The parameter **-vmd5** in the request
CheckpointDir	The parameter **-cpd** in the request
OutputDir	The parameter **-o** in the request
ArcDir	The parameter **-arcDir** in the request
Succeed count	The number of successful tasks
Failed count	The number of failed tasks
Skip count	The number of tasks that are skipped during incremental upload, download, or copy, and synchronous upload, download, or copy. **NOTE** Skipped tasks are recorded into successful tasks.
Warning count	The number of tasks that are executed successfully but contain warnings. **NOTE** • The task for which a warning is generated may be a failure or a success, which needs to be further determined according to the corresponding result list. • The number of tasks that generate warnings is independent of the number of successful or failed tasks. The total number of tasks is the number of successful tasks plus the number of failed tasks.
Succeed bytes	The number of bytes that are successfully uploaded or downloaded.
max cost	The maximum duration of all tasks, in ms
min cost	The minimum duration of all tasks, in ms
average cost	The average duration of all tasks, in ms
average tps	The average number of tasks completed per second
Task id	The unique ID of an operation, which is used to search for the result file generated for a batch task

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9 Data Processing

9.1 Image Processing

9.1.1 Overview

Introduction

Image processing is a feature integrated in Object Storage Service (OBS). It provides stable, secure, efficient, and inexpensive image processing services. By using this feature, you can slim, crop, resize, and watermark images, as well as convert the formats of images.

You can access this feature via **OBS Console** and REST APIs, to process images stored in OBS anytime and anywhere and obtain the processed images right away.

Application Scenarios

Image processing enables you to resize, crop, or compress images on cloud. You do not have to download space-consuming software to your local computers.

For example, you can add effects to or resize images in your cloud album anytime and anywhere, and quickly share the images with your friends online.

Shopping or other likewise websites where images are frequently accessed can use image processing to simply process the images and delivers them to Content Delivery Network (CDN) for acceleration. The processed images can then be faster downloaded from CDN.

Architecture

You can upload your images to OBS using **OBS Console**, OBS Browser+, REST APIs, or third-party clients. Before downloading and using an image, you can create an image style or pass image processing parameters to process it, such as cropping and compressing the image. After processing, you can obtain the URL of the new image. Furthermore, you can deliver the new image to CDN for acceleration and directly download it from CDN when needed. **Figure 9-1** shows the flowchart of image processing.

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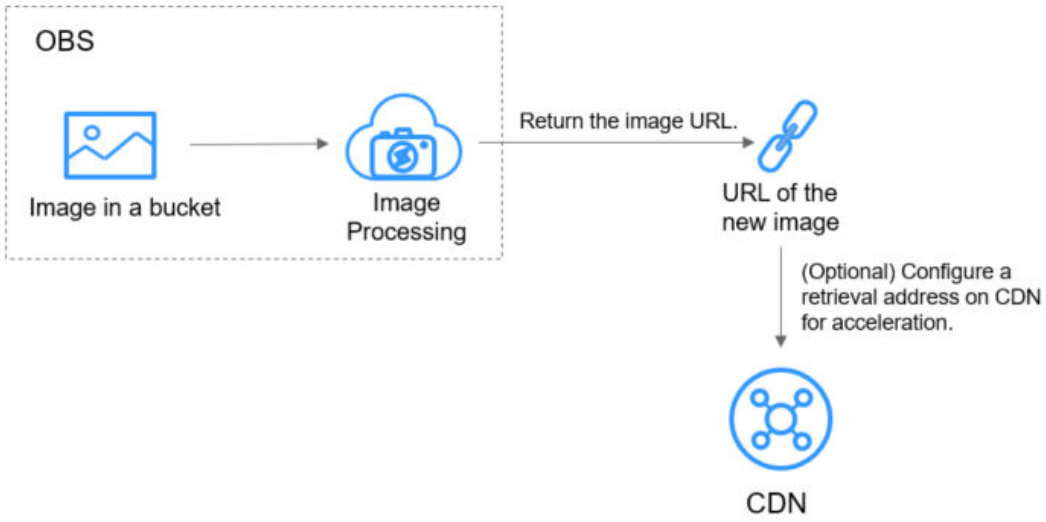
Figure 9-1 Image processing flowchart



NOTE

After processing, new images will be directly displayed in a browser and are not stored in OBS, so they do not incur any storage costs.

Billing

For details, see **How Is Image Processing Billed?**

Ways to Use Image Processing

You can access image processing in either of the following ways:

- Using **OBS Console**

  On the image processing page, you can create a processing style for an image by specifying parameters on the GUI or by editing code. You can then view the new image effect on the **Preview Image** tab page on the image's details page. You can also click **Copy Link** to get the link for accessing the new image.

  To get started with image processing on OBS Console, see **Using Image Processing on OBS Console**.

- Using the REST API

  You can call OBS Representational State Transfer (REST) APIs to access image processing. In the REST architectural style, resources on a network are identified by Uniform Resource Identifiers (URIs) and applications on clients locate resources using Uniform Resource Locators (URLs). The URL is in the **https://***Endpoint*/*uri* format. By putting a URL that complies with the command rules of image processing in a browser, you can get the new image after processing. For more information, see the **Object Storage Service API Reference**.

  To get started with image processing with API, see **Using Image Processing with APIs**.

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Image Processing Functions

Table 9-1 describes what you can do on images stored in OBS by using image processing.

Table 9-1 Image processing functions

Function	Description	How to Use
Getting Information About an Image	Returns an image's basic information, including the format, size, and average color value.	Making an API call
Setting Image Effects	Adjusts an image's effects, including the brightness, contrast, sharpness, and blur.	Using GUI on OBS Console Editing code on OBS Console Making an API call
Resizing Images	Resizes images based on a specified width, height, or percentage.	Editing code on OBS Console Making an API call
Watermarking Images	Adds a text watermark, an image watermark, or both of them to a specific position of an image. Text watermarks can have a color, font, and size configured, and image watermarks can be resized, rotated, or cropped before being added to images.	Using GUI on OBS Console Editing code on OBS Console Making an API call
Converting Formats and Interlacing Images	Converts images to various formats, and supports interlaced rendered images after conversion.	Using GUI on OBS Console Editing code on OBS Console Making an API call
Rotating Images	Rotates images clockwise, and automatically rotates images based on the recorded rotation information of cameras or smartphones.	Editing code on OBS Console Making an API call
Cropping Images	Crops images based on the specified width, height, radius of the inscribed circle, index, and radius of rounded corners.	Editing code on OBS Console Making an API call

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Function	Description	How to Use
Changing Image Quality	Compresses JPG images based on the relative quality and absolute quality.	Editing code on OBS Console Making an API call
Slimming Images	Reduces the image size without compromising its quality.	Editing code on OBS Console Making an API call
Image Processing Persistency	Synchronously stores images after processing in a specified OBS bucket for you to directly access the processed images.	Editing code on OBS Console Making an API call
Access with Commands	Orchestrates multiple process commands in sequence. With this function, you can add multiple process commands to the URL of the image that you want to process, and separate each command using the designated delimiter. Then the commands are executed one by one from left to right.	Editing code on OBS Console Making an API call
Step 3: Creating an Image Style	Customizes image styles for you to batch process images that require the same processing operations.	Using GUI on OBS Console Editing code on OBS Console

9.1.2 Notes and Constraints

Operations

- All image processing operations will not change original images.
- Archive storage does not support image processing.
- Deep Archive storage does not support image processing.
- OBS buckets that use SSE-KMS do not support image processing.
- Only version 3.0 buckets support image processing. To check a bucket's version, go to the **Basic Information** area on the bucket's **Overview** page on OBS **Console**.
- If images allow anonymous access, they can be accessed in a web browser by image processing requests that have no signature included. A request URL example is given as follows:

  https://bucketname.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=style/stylename

  For details about how to make images accessible to anonymous users, see **Granting Anonymous Users the Public Read Permission for a Bucket**.

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If images do not allow anonymous access, the image processing requests must include a signature. To calculate a signature and construct a URL with the signature included, see **Using a Pre-Signed URL**.

- For security and compliance purposes, using a default bucket domain name (**bucket domain name or static website domain name**) to preview objects in the bucket will be prohibited by OBS. When you use such domain name to access objects (such as videos, images, and web pages) through a browser, no content will be displayed. Instead, the content is downloaded as an attachment.

  For details, see **How Do I Preview OBS Objects in a Browser Online?**

- The maximum duration of a single image processing request is 30 seconds. Due to differences in image size, resolution, and others, certain scenarios may experience high latency, which can lead to request timeouts or failures.

Images

- Supported original image formats include JPG, JPEG, PNG, BMP, WebP, GIF, TIFF, HEIC, and AVIF.
- Supported formats after image processing include JPG, PNG, BMP, and WebP.
- An original image allowed for processing cannot exceed 25 MB in size, and its width and height after processing cannot exceed 4,096 pixels and 5,000 pixels, respectively.
- An animated image (like a GIF or WebP image) will be returned without processing if it is greater than 2 MB in size or has over 50 frames.
- Currently, processing images in CMYK may change their color.
- An input image can contain 250 megapixels at most.
- Only JPG and WebP images support quality changes.

Commands

A maximum of 20 commands are allowed, with a total length of no more than 512 characters.

9.1.3 Basic Concepts

Styles

A style is an aggregation of parameters or image processing operations. When performing the same operations on multiple images, you can create an image style as a template to avoid repetitive operations.

A bucket can have a maximum of 100 styles.

EXIF Data

Exchangeable Image File (EXIF) data is contained in images taken by some cameras or smartphones.

EXIF data is a group of parameters inserted into JPEG or TIFF images. It encompasses the shooting information, such as the camera model, date and time when an image was taken, shooting mode, thumbnails, and other characteristics.

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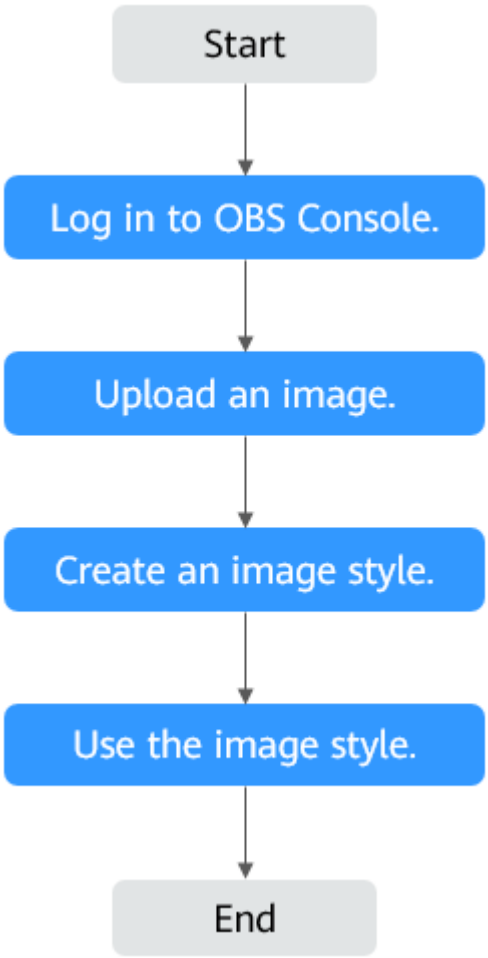
9.1.4 Using Image Processing on OBS Console

Process

On the image processing page of **OBS Console**, you can create a processing style for an image by specifying parameters on the GUI or by editing code. You can then view the new image effect on the **Preview Image** tab page on the image's details page. You can also click **Copy Link** to get the link for accessing the new image.

You can use OBS Console, OBS SDKs, or REST APIs to process images. **Figure 9-2** shows the flowchart of using image processing on **OBS Console**.

Figure 9-2 Flowchart of using image processing on OBS Console



Step 1: Registering an Account

Before using image processing, you must have a cloud service account and enable OBS. Once OBS is enabled, image processing is available for use. To use OBS properly, make sure that you have sufficient account balance or you have a valid payment method. If you have already enabled OBS and you can use it properly, skip this section.

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Step 1 Visit the **Huawei Cloud official website**.

Step 2 Create a HUAWEI ID.

Before using OBS, you need to first create a HUAWEI ID. If you already have one, start from **Step 2: Uploading an Image**.

1. On the right of the top navigation bar, click **Sign Up**.
2. Complete the account creation as instructed.

   After the creation is complete, you will be navigated to your information page.

----End

Step 2: Uploading an Image

NOTE

For the constraints on the format and size of images you can upload, see **Notes and Constraints**.

Step 1 In the bucket list of **OBS Console**, click the desired bucket to go to the **Objects** page.

Step 2 Click **Upload Object** to open the **Upload Object** dialog box.

Step 3 Click **add files** marked by red box in **Figure 9-3** to open the local file browser.

Figure 9-3 Uploading an image

Step 4 Select the image that you want to upload and click **Open**.

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Step 5 Click **Upload**.

----End

Step 3: Creating an Image Style

Each image style specifies a set of processing operations, including cropping, compression, and adding watermarks. For multiple images that require the same processing operations in a bucket, you can create an image style to apply it to the images.

When creating a style, you can preview the style effect of the sample image on the right in real time.

When using REST APIs to access image processing, you can call the style name in the URL to avoid entering complex commands. For details about the domain name rules for API access, see **Access with a Style Name**.

You can create up to 100 styles for a bucket.

You can also replicate existing image processing styles from another bucket.

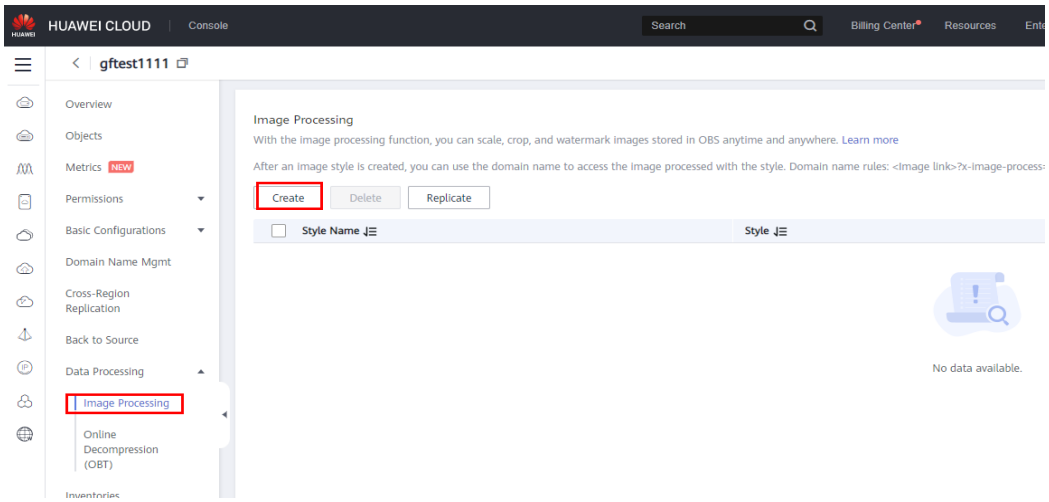
NOTE

If you are an IAM user, before creating an image style, make sure that programmatic access has been enabled for yourself. For details, see **Viewing or Modifying IAM User Information**.

Step 1 Log in to **OBS Console**.

Step 2 Click a desired bucket name. In the navigation pane, choose **Data Processing** > **Image Processing**.

Figure 9-4 Image processing



Step 3 Click **Create** to go to the style editing page shown in **Figure 9-5**.

Figure 9-5 Creating a style

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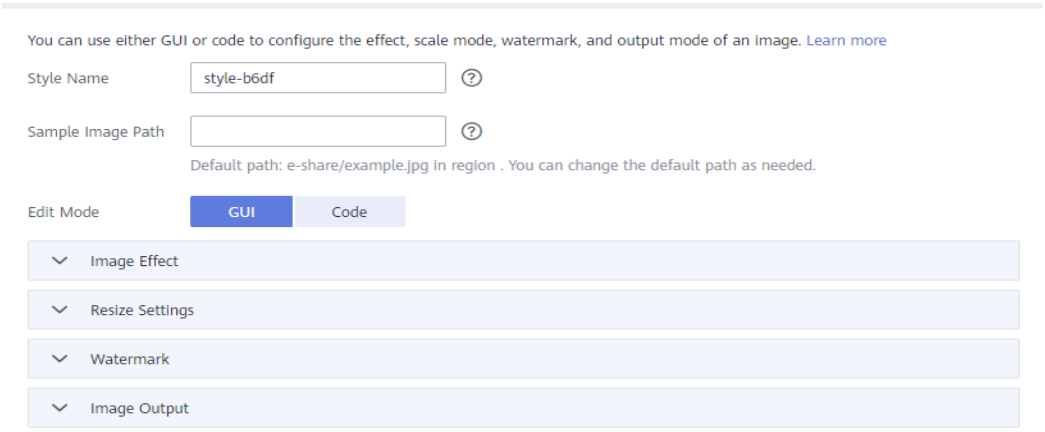

Step 4 On the editing page, specify a style name and configure properties:

- **Style Name**

  Enter an easy-to-remember style name. Only letters (uppercase or lowercase), digits, periods (.), underscores (_), and hyphens (-) are allowed. The style name contains 1 to 256 characters, for example, **rotate_0001**.

- **Edit Mode**

  Choose either **GUI** or **Code** to create an image style by configuring parameters or by editing code.

  An example code is as follows:

  ```
  image/resize,m_lfit,h_400,w_400,limit_1
  ```

- Other settings

  Configure the image effect, resizing, watermark, and output.

Step 5 Click **OK** to save the style. The new style will be displayed in the style list.

----End

Replicating Image Styles

You can replicate an existing image style to quickly create one.

Step 1 Log in to **OBS Console**.

Step 2 Click a desired bucket name. In the navigation pane, choose **Data Processing** > **Image Processing**.

Step 3 Click **Replicate**.

Step 4 Select a replication source, which is the source bucket where the required image styles were configured.

NOTE

- The image styles replicated from a source bucket will not overwrite existing styles in the current bucket, and any that conflict with the existing ones will not be replicated.
- The version of both source and destination buckets must be 3.0.
- You can remove the styles that you do not want to replicate.

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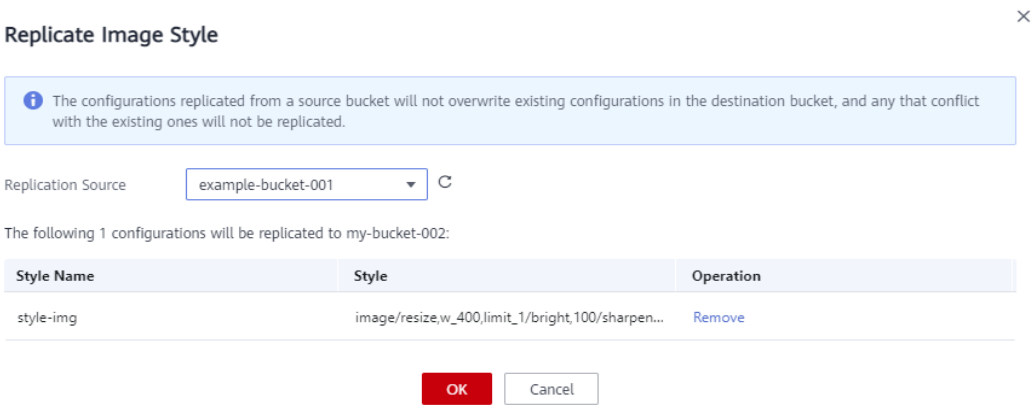
Figure 9-6 Replicating image styles



Step 5 Click **OK** to replicate the image styles to the current bucket.

----End

Step 4: Using the Image Style

You can use existing image styles in a bucket in either of the following ways:

- **Copying a link** (see **Copying a Link**): On an image's details page of **OBS Console**, you can copy a link for accessing the image with a style applied on the **Preview Image** tab page. By pasting the copied link in a browser, you can get the new image.
- **Editing a domain name**: You can edit a domain name by referring to the format given below and open it in a browser to have the image with the style applied.
  <*Image link*>?x-image-process=style/<*Style name*>

  Image link can be obtained from the image details page. For details, see **Editing a Domain Name**. *Style name* is the one defined when the style was created. A style name can contain only uppercase or lowercase letters, digits, periods (.), underscores (_), and hyphens (-) and is 1 to 256 characters long, for example, **rotate_0001**.

Copying a Link

Step 1 Log in to **OBS Console**.

Step 2 Click the name of the bucket that houses desired styles to go to the **Objects** page.

Step 3 Click the name of an existing image or of a newly uploaded image to go to its details page.

Step 4 Click the **Preview Image** tab to preview the image effect in one or more styles.

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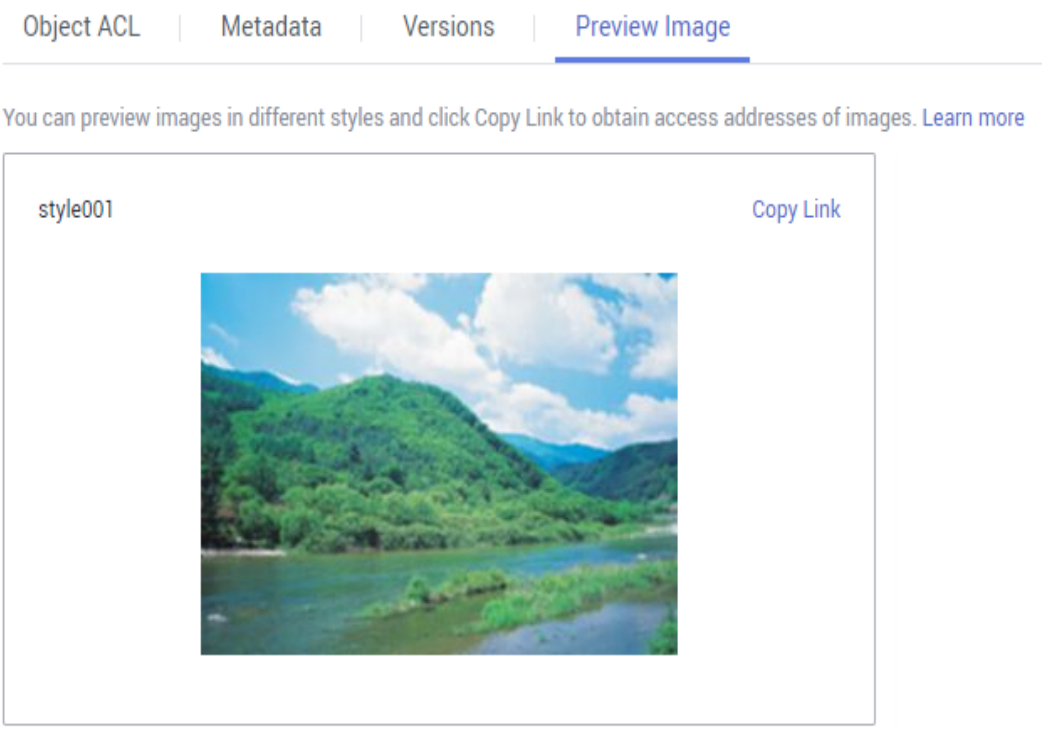
Figure 9-7 Preview Image



Step 5 Click **Copy Link** in the style card you want. If **Copied successfully.** is prompted, you have got the link for accessing the image with the style applied.

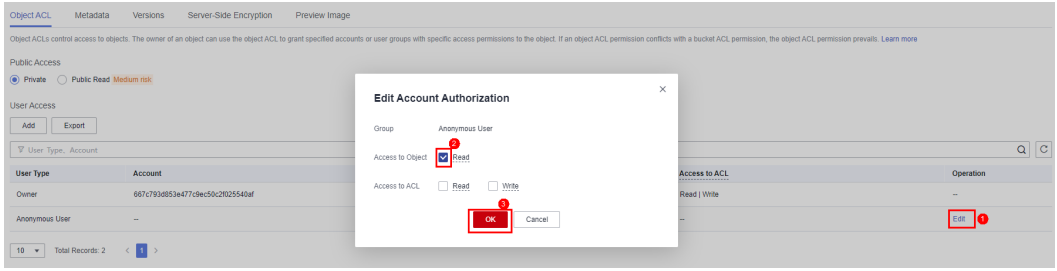
----End

Editing a Domain Name

Step 1 On the OBS object list page, click an image to be processed to go to its details page.

Step 2 Choose **Object ACL** > **User Access** > **Anonymous User** and click **Edit**. In the displayed dialog box, grant the object read permission to anonymous users and click **OK**. For details, see **Figure 9-8**.

Figure 9-8 Granting the object read permission to anonymous users



Step 3 Click the icon next to **Link** to copy the image link.

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Step 4 Add **?x-image-process=style/<*Style name*>** to the end of the copied link and open the new link in a browser. Then, you can access the image with the style applied.

Link example:

https://bucketname.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=style/stylename

NOTE

The links and style names above are for reference only. Change them accordingly in practice.

----End

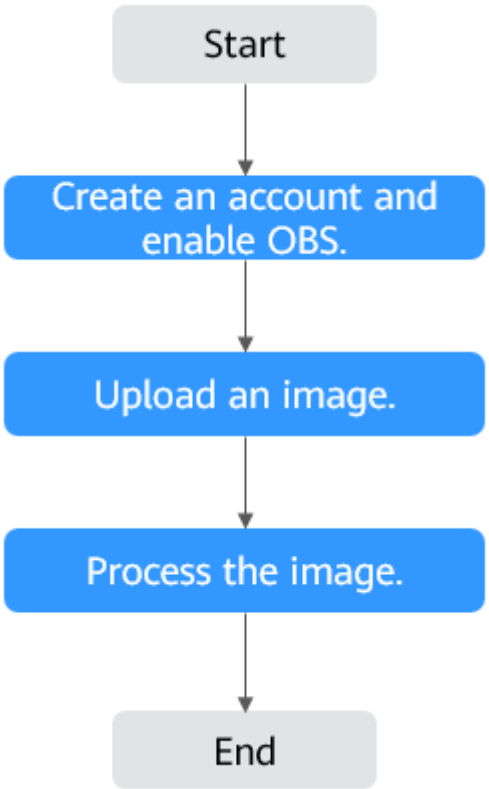
9.1.5 Using Image Processing with APIs

Process

You can call OBS Representational State Transfer (REST) APIs to access image processing. In the REST architectural style, resources on a network are identified by Uniform Resource Identifiers (URIs) and applications on clients locate resources using Uniform Resource Locators (URLs). The URL is in the **https://***Endpoint*/*uri* format. By putting a URL that complies with the command rules of image processing in a browser, you can get the new image after processing.

Figure 9-9 shows the flowchart of using image processing with REST APIs.

Figure 9-9 Flowchart of using image processing with REST APIs



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Creating an Account and Enabling OBS

Before using image processing, you must have a cloud service account and enable OBS. Once OBS is enabled, image processing is available for use. To use OBS properly, make sure that you have sufficient account balance or you have a valid payment method. If you have already enabled OBS and you can use it properly, skip this section.

Step 1 Visit the **Huawei Cloud official website**.

Step 2 Click **Sign Up** in the upper right corner.

Step 3 Complete the account creation as instructed.

After the creation is complete, you will be navigated to your information page.

Step 4 Create an OBS bucket, so that you can use image processing properly.

----End

Uploading an image

You can upload images using **OBS Console**, OBS Browser+, or REST APIs.

For details, see **Upload Overview**.

Skip this section if the image to be processed already exists in your bucket.

NOTE

If you want to use a user-defined domain name for image processing, you need to grant anonymous users the read permission for the image. For more information, see **Granting All Accounts the Read Permission for Certain Objects**.

Processing the Image

This section describes how to build a URL for processing images using REST APIs. Once you have enabled OBS successfully, you can call REST APIs to process images simply by putting a URL that complies with the command rules of image processing in a browser.

URL Composition

A URL consists of the OBS domain name, bucket name, the original image name, and processing command or style name.

Access with Commands

URL format: **https://***bucketName.endpoint***/***objectName***?x-image-process=image/***commands*

- *endpoint* represents the endpoint address of the region where the bucket is located. You can obtain the endpoint from the bucket's basic information. For more information, see **Regions and Endpoints**.
- *bucketName* represents the name of the bucket that accommodates the image to be processed on OBS.

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- *objectName* represents the name of the original image stored in the *bucketName* bucket. The name suffix must be supported by image processing.
- *commands* represents the processing commands. Three types of **delimiters** can be used between commands or command parameters. If no commands are specified, the original image will be returned.

Example URL: **https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/crop,x_100,y_50**

- **Delimiters**

Delimiters are used to separate one field from another in the commands in a URL. For details, see **Table 9-2**.

Table 9-2 Delimiters

Name	Character	Sequence	Description
Parameter delimiter	_	Fixed	Delimiter between a parameter and its value
Command delimiter	,	Irrelevant	Delimiter between command parameters
Pipe delimiter	/	Relevant	Delimiter between two processing commands. See **Pipes**.

- **Pipes**

If an image needs to be processed by multiple operations (for example, it needs to be cropped first and then resized), the operation commands must be separated with pipe delimiters (/). The operations (also pipes) will be executed sequentially from left to right.

For example, **https://image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,w_100,h_100/quality,q_80** are two pipes executed from left to right. The output of the left command becomes the input of the right command.

Access with a Style Name

URL format: **https://***bucketName.endpoint***/***objectName***?x-image-process=style/***stylename*

- *endpoint* represents the endpoint address of the region where the bucket is located. You can obtain the endpoint from the bucket's basic information. For more information, see **Regions and Endpoints**.
- *bucketName* is the bucket name on OBS.
- *objectName* represents the name of the original image stored in the *bucketName* bucket. The name suffix must be supported by image processing.

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- *stylename* is the name of an existing style in the *bucketName* bucket on OBS Console. At present, REST APIs cannot be used to perform operations related to styles, such as creating, changing, or deleting styles.

Example URL: **https://image-demo.obs.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=style/stylename**

9.1.6 Getting Information About an Image

You can get the information about an image only by making an API call.

The image information you can get includes the width, height, size, and format of an image. If the image contains **EXIF Data**, the EXIF data will be returned in JSON.

This operation is represented by **info**.

Example

Below gives an example of querying information about the **example.jpg** image:

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/info

```
{
    "format":"JPEG",
    "height":2000,
    "size":1046583,
    "width":2668
}
```

9.1.7 Getting the Average RGB Value of an Image

You can get the average RGB value of an image only by making an API call.

The returned average RGB value is a hexadecimal string in JSON.

This operation is represented by **average-hue**.

Example

Below gives an example of querying the average RGB value of the **example.jpg** image:

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/average-hue

If information similar to the following is displayed, the average RGB value of the image is obtained:

```
{"RGB":"#28577D"}
```

Original **example.jpg** image:

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Color corresponding to the average RGB value (#28577D):

9.1.8 Setting Image Effects

Setting the Brightness

You can use the GUI or code mode on **OBS Console** or make an API call to adjust the brightness of an image.

Table 9-3 describes the parameters.

This operation is represented by **bright**.

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Table 9-3 Brightness parameters

Parameter	Value Description	Code Example
value	It adjusts the brightness of an image and ranges from **-100** to **100**. The original brightness value is **0**. A larger value means a higher level of brightness.	image/bright,50

Examples of Setting the Brightness

- Set the brightness to **50**.

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/bright,50

- Set the brightness to **-50**.

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/bright,-50

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Setting the Contrast

You can use the GUI or code mode on **OBS Console** or make an API call to adjust the contrast of an image.

Table 9-4 describes the parameters.

This operation is represented by **contrast**.

Table 9-4 Contrast parameters

Parameter	Value Description	Code Example
value	It adjusts the contrast of an image and ranges from **-100** to **100**. The original contrast value is **0**. A larger value means a higher level of contrast.	image/contrast,-50

Example of Setting the Contrast

- Set the contrast to **-50**.

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/contrast,-50

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Setting the Sharpness

You can use the GUI or code mode on **OBS Console** or make an API call to adjust the sharpness of an image.

Table 9-5 describes the parameters.

This operation is represented by **sharpen**.

Table 9-5 Sharpness parameters

Parameter	Value Description	Code Example
value	It adjusts the sharpness of an image and ranges from **50** to **399**. The recommended value is **100**. Technically, a larger value means a clearer image, but a too large value will make the image grainy.	image/sharpen,100

Example of Setting the Sharpness

- Set the sharpness to **100**.

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/sharpen,100

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Setting the Blur

You can use the GUI or code mode on **OBS Console** or make an API call to adjust the blur of an image.

Table 9-6 describes the parameters.

This operation is represented by **blur**.

Table 9-6 Blur parameters

Parameter	Value Description	Code Example
r	It represents the blur radius. Its value ranges from **1** to **50**. A larger radius means a larger blurred area.	image/blur,r_3,s_2
s	It represents the standard deviation of normal distribution. Its value ranges from **1** to **50**. A large standard deviation significantly blurs, while a small standard deviation blurs less.	

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NOTE

In GUI mode, the parameter **r** and **s** increase or decrease simultaneously.

Example of Setting the Blur

- Set **r** to **3** and **s** to **2**.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/blur,r_3,s_2

Setting the Grayscale

You can edit code on **OBS Console** or make an API call to convert an image to grayscale.

Table 9-7 describes the parameters.

This operation is represented by **colorspace**.

Table 9-7 Grayscale parameters

Parameter	Value Description	Code Example
value	It changes the color mode of an image. You can set the parameter to **gray** to convert the image to grayscale.	image/colorspace,gray

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Example of Setting the Grayscale

- Convert an image to grayscale.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/colorspace,gray

9.1.9 Resizing Images

You can use the GUI or code mode on **OBS Console** or make an API call to resize images. Images can be resized based on a specific rule or a fixed width, height, or percentage.

NOTE

- A long side refers to the side with a larger ratio of its original size to its target size, and a short side refers to the side with a smaller ratio. Assume that the original size of an image is 400 × 200 pixels and it is resized to 100 × 100 pixels. The ratio of 400 pixels to 100 pixels is 4 and that of 200 pixels to 100 pixels is 2, so the long side is 400 pixels and the short side is 200 pixels.
- For a target image after resizing, its long side cannot exceed 9,999 pixels, and the product of its width and height cannot exceed 24,999,999 pixels.
- If you only specify the height or width for resizing, the target image keeps the same aspect ratio and format as the original image.
- By default, resizing is not allowed to scale up an image. If you want an image to become larger after resizing, you need to set **limit** to **0** to obtain the enlarged image, or the original image will be returned. To do this, use the following format:

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,w_500,limit_0

Table 9-8 describes the parameters.

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This operation is represented by **resize**.

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Table 9-8 Resizing parameters

Parameter	Value Description	Code Example
m	Type of resizing. The value can be **lfit** (the default value), **mfit**, **fill**, **pad**, or **fixed**. • **lfit**: Specify a rectangle with a given width (indicated by **w**) and height (indicated by **h**), lock the aspect ratio, and obtain the largest image in the rectangle. • **mfit**: Specify a rectangle with a given width (indicated by **w**) and height (indicated by **h**), lock the aspect ratio, and obtain the smallest image in the rectangle's extended area. • **fill**: Specify a rectangle with a given width (indicated by **w**) and height (indicated by **h**) and lock the aspect ratio. Obtain the smallest image in the rectangle's extended area, and center and crop the image. **fill**-based resizing actually centers and crops a target image resized with **mfit**. • **pad**: Specify a rectangle with a given width (indicated by **w**) and height (indicated by **h**) and lock the aspect ratio. Obtain the largest image in the rectangle and fill the blank area with color. **pad**-based resizing actually fills the blank area of a target image resized with **lfit**. • **fixed**: Resize an image based on a fixed width and height. • **ratio**: Specify an aspect ratio (a ratio of **w** to **h**), in the range of **1** to **1000**, and	image/resize,m_lfit,h_100,w_100

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Parameter	Value Description	Code Example
	obtain the largest image that meets the specified ratio.	
p	Percentage of the aspect ratio, in the range of **1** to **1000**. If the value is: ● < 100: The image is scaled down. ● = 100: The image is kept unchanged in size. ● > 100: The image is scaled up.	image/resize,p_50
h	Height of the target image, in the range of **1** to **9999**. The product of the target image's width and height cannot exceed 24,999,999.	image/resize,m_lfit,h_100
w	Width of the target image, in the range of **1** to **9999**. The product of the target image's width and height cannot exceed 24,999,999.	image/resize,m_fixed,h_100,w_100
l	The long side of the target image, in the range of **1** to **4096**. The product of the target image's width and height cannot exceed 24,999,999. The long side has a specified value, and the short side is scaled based on the ratio.	image/resize,l_100
s	The short side of the target image, in the range of **1** to **4096**. The product of the target image's width and height cannot exceed 24,999,999. The short side has a specified value, and the long side is scaled based on the ratio.	image/resize,s_100

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Parameter	Value Description	Code Example
color	Color for filling the blank area after resizing. This parameter can be used when you set **m** to **pad**. The value is a hexadecimal code, from **000000** to **FFFFFF** (default value, representing white).	image/resize,m_pad,h_100,w_100,color_FF0000
limit	Whether to limit the size of the target image when the target image is larger than the original one. The value can be **0** or **1** (default value). • **0**: The size is not limited. • **1**: The size is limited.	image/resize,p_150,limit_0

CAUTION

If a resized image is aliased, you can add **/marker,u_plus** to the end of the image processing URL for optimization.

For example, the image processing URL is as follows:

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,m_fixed,w_2668,h_1999,limit_0

After the parameter is added, the link is as follows:

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,m_fixed,w_2668,h_1999,limit_0/marker,u_plus

Examples

- Set **h** to **100** and **m** to **lfit** (the default value) to process the width proportionally.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,m_lfit,h_100

- Lock the aspect ratio and specify the short side to resize the image into 100 × 100 pixels.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,m_lfit,h_100,w_100

- Set the long side size to **100** and scale the short side based on the ratio.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,l_100

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- Fix the width and height, center and crop the image, resize the image into 100 × 100 pixels.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,m_fill,h_100,w_100

- Fix both the width and height to **100**.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,m_fixed,h_100,w_100

- Fix the width and height. Resize the image into 100 × 100 pixels by specifying the short side and fill the blank area with white.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,m_pad,h_100,w_100

- Fix the width and height. Resize the image into 100 × 100 pixels by specifying the short side and fill the blank area with red.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,m_pad,h_100,w_100,color_FF0000

- Scale up the image to 150% of its original size and set **limit** to **0** to obtain the enlarged image.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,p_150,limit_0

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- Set **p** to **30** to scale down the image to 30% of its original size.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,p_30

- Set an image's aspect ratio to 3:2.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,m_ratio,w_3,h_2

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Resizing an Image by Editing Code on OBS Console

Step 1 On the homepage of the **management console**, click **Service List** in the upper left corner and choose **Storage** > **Object Storage Service**.

Step 2 In the bucket list, click the bucket you want to go to the **Objects** page.

Step 3 Click **Upload Object** to open the **Upload Object** dialog box.

Step 4 Click **add files** marked by red box in **Figure 9-10** to open the local file browser.

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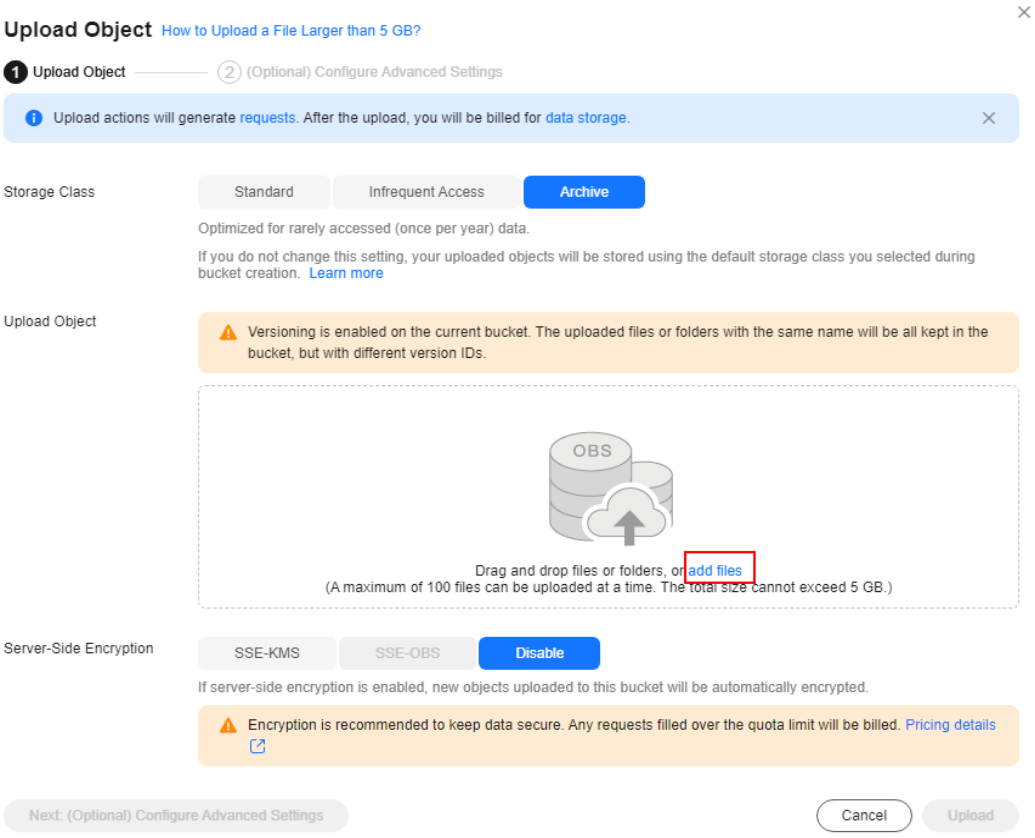
Figure 9-10 Uploading an image



Step 5 Select the image that you want to upload and click **Open**.

Step 6 Click **Upload** to upload the image. The uploaded image is displayed in the object list.

Step 7 In the navigation pane, choose **Data Processing** > **Image Processing**.

Step 8 Click **Create** to go to the style editing page.

Step 9 Set **Style Name** to **style002** and choose **Code** for **Edit Mode**.

Step 10 In the code input box, type the following command for resizing.

Specify a rectangle whose width (indicated by **w**) and height (indicated by **h**) are both 100. Lock the aspect ratio, and obtain the smallest image in the extended area of the 100 × 100 rectangle.

```
image/resize,m_mfit,h_100,w_100
```

The style effect will be displayed on the right in real time. **Figure 9-11** shows the final style effect.

Figure 9-11 Effect of style **style002**

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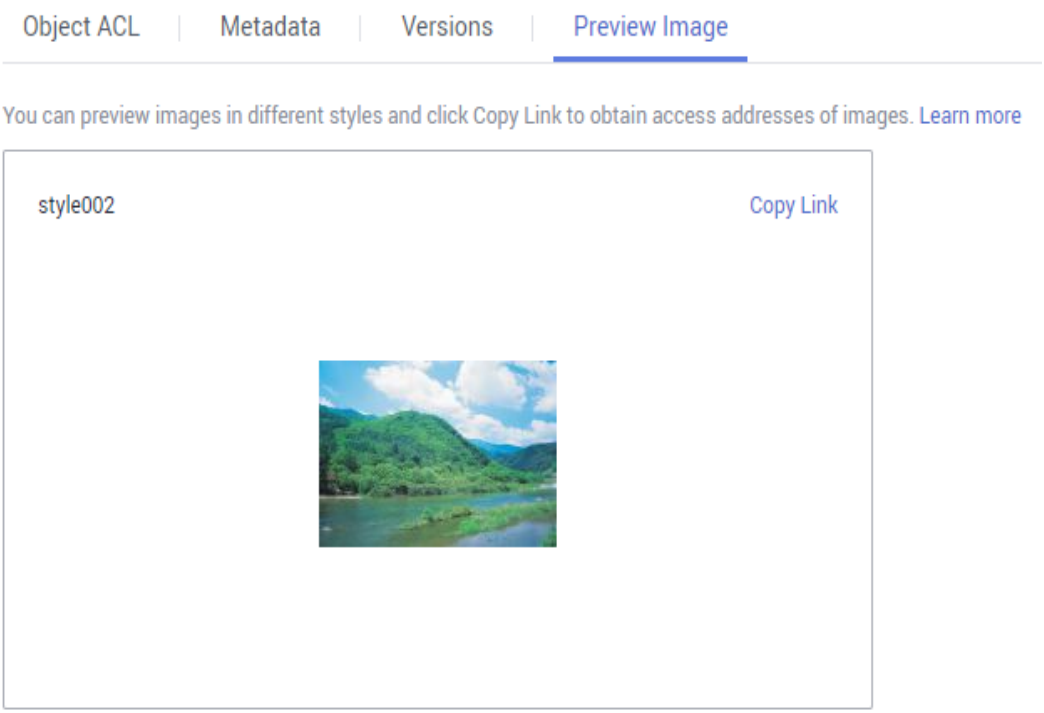
Step 11 Click **OK** to save the style. The new style **style002** will be displayed in the style list.

Step 12 In the navigation pane, choose **Objects**. Click **mountain.jpg** in the object list to go to the file details page.

Step 13 Click the **Preview Image** tab to preview the effect of the image with style **style002** applied.

Figure 9-12 Preview Image



Step 14 In the image style card, click **Copy Link**. When **Copied successfully.** is prompted, you will have the address for accessing the image with the style applied.

----End

9.1.10 Rotating Images

Setting the Rotation

You can edit code on **OBS Console** or make an API call to rotate images clockwise.

Table 9-9 describes the parameters.

This operation is represented by **rotate**.

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Table 9-9 Rotation description

Parameter	Value Description	Code Example
value	It defines the angle of a clockwise rotation and ranges from **0** to **360**. The default value is **0**, which means the image is not rotated. A larger value means the image is clockwise rotated by a larger angle.	image/rotate,90

NOTE

- After rotation, dimensions of an image may increase.

Examples of Setting the Rotation

Set the width to **100** and the rotation angle to **90**.

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,w_100/rotate,90

Set the width to **100** and the rotation angle to **220**.

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,w_100/rotate,220

Setting the Adaptive Orientation

You can use the GUI or code mode on **OBS Console** or make an API call to use adaptive orientation.

Images shot by cameras or smartphones may contain **EXIF Data**, like an orientation parameter. Since an image's rotation information is recorded in the orientation parameter, a browser can automatically rotate the image to the right position based on the orientation parameter.

With adaptive orientation configured, images that contain the orientation parameter will be rotated automatically. For details, see **Table 9-10**.

This operation is represented by **auto-orient**.

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Table 9-10 Adaptive orientation description

Parameter	Value Description	Code Example
value	The value can be **0** or **1** (default value). **0**: Adaptive orientation is not configured. The image will not rotate automatically and will keep the default orientation. **1**: Adaptive orientation is configured. The image will rotate automatically before being resized.	image/resize,w_100/auto-orient,0

NOTE

- The adaptive orientation can be configured only when the height and width of an image are both smaller than 4,096.
- If an image's EXIF data does not contain any rotation parameters or the image has no EXIF data at all, the **auto-orient** parameter does not work for the image.

Example of Setting the Adaptive Orientation

- Set the width of an image to **100**, and do not configure the adaptive orientation.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,w_100/auto-orient,0

Flipping Images

You can edit code on **OBS Console** or make an API call to flip images.

Images can be flipped horizontally or vertically. **Table 9-11** describes the parameters.

This operation is represented by **flip**.

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Table 9-11 Flipping description

Parameter	Value Description	Code Example
value	If this parameter is set to **vertical**, an image is flipped vertically. If this parameter is set to **horizontal**, an image is flipped horizontally.	image/flip,vertical

NOTE

- After flipping, dimensions of an image may increase.

Examples of Flipping Images

Flip an image horizontally.

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/flip,horizontal

Figure 9-13 Flipping an image horizontally

Flip an image vertically.

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/flip,vertical

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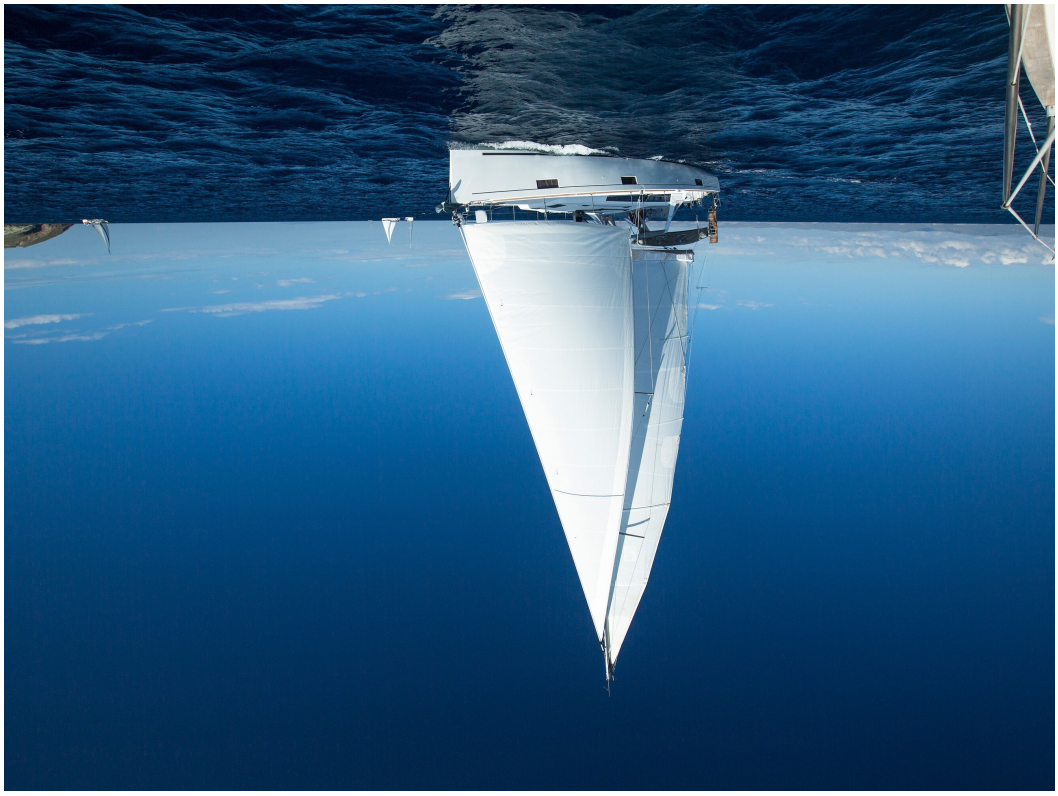
Figure 9-14 Flipping an image vertically



9.1.11 Cropping Images

Common Cropping

You can edit code on **OBS Console** or make an API call to crop images.

You can start at any point on an image and crop the image into a rectangle with specified width and height. **Table 9-12** describes the parameters.

This operation is represented by **crop**.

Table 9-12 Common cropping parameters

Parameter	Value Description	Code Example
g	The location where cropping starts. **g** can be set to **tl**, **top**, **tr**, **left**, **center**, **right**, **bl**, **bottom**, or **br**. **Figure 9-15** shows a 3×3 grid illustrating these values. Each value locates at the top left corner of the cell.	image/crop,x_10,y_10,w_200,h_200,g_br
h	Cropping height. Its value ranges from **0** to *Original height*.	

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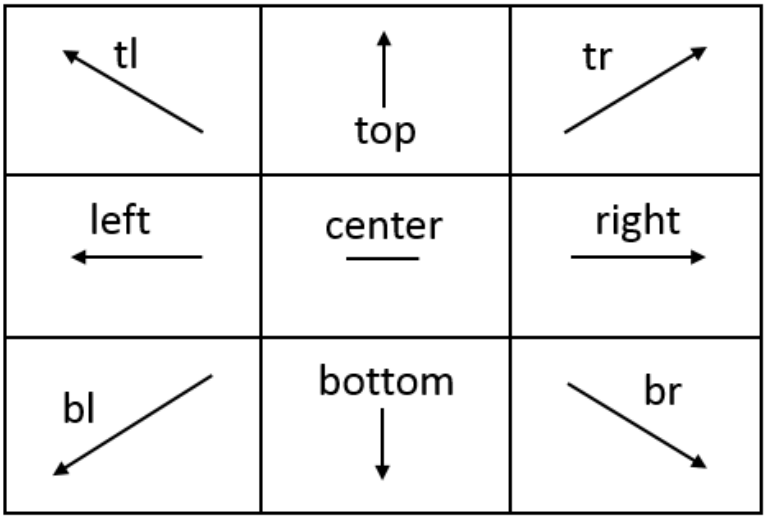
Parameter	Value Description	Code Example
w	Cropping width. Its value ranges from **0** to *Original width*.	
x	x-coordinate of the start point. The top left corner is the default origin. The parameter value ranges from **0** to *Original image width*.	
y	y-coordinate of the start point. The top left corner is the default origin. The parameter value ranges from **0** to *Original image height*.	

Figure 9-15 shows the cropping origins.

Figure 9-15 3×3 grid of cropping origins



NOTE

- If x is larger than the origin width, or y is larger than the origin height, the cropping cannot be executed and a fault will be returned.
- If h is larger than the origin height and w is larger than the original width, the image will be cropped to the boundaries.

Examples of Common Cropping

- Set the start point of cropping to **(1000, 500)**, and set both the width and height to **1000**.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/crop,x_1000,y_500,w_1000,h_1000

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- Set the start point of cropping to **(10, 10)** in the bottom right (**br**) cell, and set both the width and height to **200**.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/crop,x_10,y_10,w_200,h_200,g_br

Inscribed Circles

You can edit code on **OBS Console** or make an API call to get an inscribed circle of an image.

Choose the image center as the center of a circle, and crop the image according to the specified radius. The image then is cropped into a circle. **Table 9-13** describes the parameters.

This operation is represented by **circle**.

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Table 9-13 Inscribed circle parameters

Parameter	Value Description	Code Example
r	Radius specified for the inscribed circle. Its value ranges from **0** to *Half of the image's short side*.	image/circle,r_100

NOTE

- If the output format is set to JPG, the area outside the inscribed circle is white. If the output format is set to a vector format such as PNG, WebP, or BMP, the area outside the inscribed circle is transparent. PNG is the recommended output format.
- Even if **r** is larger than half of the short side, the generated inscribed circle is still the image's largest inscribed circle (with a radius equal to half of the short side).

Example of Making an Inscribed Circle

Set the radius to **100** and output format to **jpg** (with the area outside the inscribed circle being white).

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/circle,r_100

Indexcropping

You can edit code on **OBS Console** or make an API call to indexcrop images.

Set the top left corner of the image as the starting point. Set x-axis overlapping with the width, and y-axis overlapping with the height. Crop the image into several consecutive partitions horizontally or vertically, each having equal width or height. Get the partition you want according to the index. **Table 9-14** describes the parameters.

This operation is represented by **indexcrop**.

Table 9-14 Indexcropping parameters

Parameter	Value Description	Code Example
x	Width of each partition in horizontal cropping, ranging from **1** to *Original image width*. **x** and **y** cannot be chosen at the same time.	image/indexcrop,x_1000,i_0

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Parameter	Value Description	Code Example
y	Height of each partition in vertical cropping, ranging from **1** to *Original image height*. **x** and **y** cannot be chosen at the same time.	
i	If there are *n* partitions in total, the value of **i** ranges from **0** to *n–1*. When **i** is set to **0**, you obtain the first partition. If you set **i** to a value larger than *n–1*, the original image will be returned.	

Examples of Indexcropping

- Indexcrop an image into partitions with a width of **1000** horizontally and choose the first partition.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/indexcrop,x_1000,i_0

- Indexcrop an image into partitions with a width of **600** horizontally and choose the first partition.

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https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/indexcrop,x_600,i_0

Rounded Corner Cropping

You can edit code on **OBS Console** or make an API call to round corners of an image.

This operation allows you to cut off the corners of an image based on the specified radiuses. You can configure the radius of image corners to round in two ways. For details, see **Table 9-15**.

This operation is represented by **rounded-corners**.

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Table 9-15 Rounded corner parameters

Parameter	Value Description	Code Example
r	It indicates both horizontal and vertical radiuses of image corners you will round. You can configure it by using the number of pixels (for example, **200**) or the percentage (for example, **25p**). The number of pixels ranges from **1** to **4096**. If this number is greater than half of the original image's short side, the half of the short side is applied. The percentage ranges from **1p** to **50p**. **r** cannot be used together with **rx** or **ry**.	image/rounded-corners,r_100
rx	It indicates the horizontal radius of image corners you will round. You can configure it by using the number of pixels (for example, **200**) or the percentage (for example, **25p**). The number of pixels ranges from **1** to **4096**. If this number is greater than half of the original image's short side, the half of the short side is applied. The percentage ranges from **1p** to **50p**. **rx** must be used together with **ry**.	image/rounded-corners,rx_100,ry_200
ry	It indicates the vertical radius of image corners you will round. You can configure it by using the number of pixels (for example, **200**) or the percentage (for example, **25p**). The number of pixels ranges from **1** to **4096**. If this number is greater than half of the original image's short side, the half of the short side is applied. The percentage ranges from **1p** to **50p**. **ry** must be used together with **rx**.	

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NOTE

If the output image format is JPG, the cut-out corner area is white. If the output image format is PNG, WebP, or BMP, the cut-out corner area is transparent. You are advised to save rounded corner images in PNG.

Examples of Rounded Corner Cropping

- Round the corners of image **example.jpg** based on the horizontal and vertical radiuses of **100** and save the new image as PNG.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/rounded-corners,r_100/format,png

- Round the corners of image **example.jpg** based a horizontal radius of **100** and a vertical radius of **200**.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/rounded-corners,rx_100,ry_200

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9.1.12 Watermarking Images

Public Parameters

You can use the GUI or code mode on **OBS Console** or make an API call to configure public parameters for watermarking.

You can add a text or image watermark to the original image.

The Base64 code for URL transmission applies to paths of content and fonts of text watermarks, or paths of image watermarks. It is not advisable to put standard Base64 code directly into the URL for transmission. In Base64 encoding for URL transmission, contents are coded into character strings by standard Base64 code. After verifying these strings, replace the plus sign (+) with hyphen (-), and slash (/) with underline (_). For details about encoding, see those specified in RFC4648.

This operation is represented by **watermark**.

Public parameters are those applicable to both image watermarks and text watermarks. You can add these two types of watermarks to the same image. **Table 9-16** describes the parameters.

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Table 9-16 Public parameters

Parameter	Value Description	Code Example
g	Optional. **g** represents the watermark location. It can be set to **tl**, **top**, **tr**, **left**, **center**, **right**, **bl**, **bottom**, or **br**. The default value is **tl**. **Figure 9-16** shows a 3×3 grid illustrating these values. Each value locates at the top left corner of the cell.	image/watermark,image_aW1hZ2UtZGVtby9sb2dvLnBuZw==,g_br,t_90,x_10,y_10
x	Optional. **x** represents the horizontal distance from the image edge. By default, the origin is at the top left corner. The value ranges from **0** to **4096**, in pixels. The default value is **10**.	
y	Optional. **y** represents the vertical distance from the image edge. By default, the origin is at the top left corner. The value ranges from **0** to **4096**, in pixels. The default value is **10**.	
voffset	Optional. **voffset** represents the vertical offset from the horizontal centerline of the image. It moves a watermark upward or downward from the horizontal centerline of the image. The value ranges from **-1000** to **1000**, in pixels. The default value is **0**. **voffset** is meaningful only when **g** is set to **left**, **center**, or **right**.	
align	Optional. **align** represents the alignment of the text and image watermarks. The value can be **0** (default value), **1**, or **2**. • **0**: top alignment • **1**: center alignment • **2**: bottom alignment	

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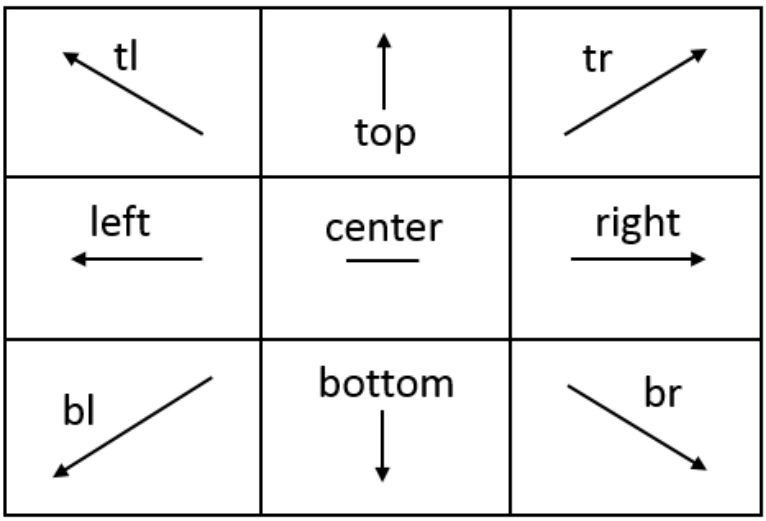
Parameter	Value Description	Code Example
order	Optional. **order** represents the placement order of the text and image watermarks. The value can be **0** (default value) or **1**. • **0**: image watermark in front of the text watermark • **1**: text watermark in front of the image watermark	
t	Optional. It represents the transparency of a watermark. Its value ranges from **0** to **100**. The default value is **100**, indicating the watermark is not transparent at all.	
interval	Optional. It represents the distance between a text watermark and an image watermark. Its value ranges from **0** to **1000**.	

Figure 9-16 shows a 3×3 grid illustrating the watermark locations.

Figure 9-16 3×3 grid of watermark locations



NOTE

If both a text watermark and an image watermark are added to the same image, you can configure **x**, **y**, and **voffset** to adjust the watermark locations and their layout.

Image Watermarks

You can pre-process an image watermark before adding it to an image.

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The pre-processing operations include those described in **Resizing Images**, **Rotating Images**, and **Cropping Images**, but cropping an image watermark into an inscribed circle is not allowed. When resizing an image watermark, you can scale it to a specific percentage of the original image size.

Table 9-17 describes the image watermark parameters.

Table 9-17 Image watermark parameters

Parameter	Value Description	Code Example
image	Mandatory. It indicates the watermark image path. The watermark image path is *bucketName*/*objectName* (encoding required) or *bucketName*/*objectName*?**x-image-process**=*image*/*command* (encoding required). **NOTICE** The content must be URL-safe Base64 encoded in the **encodedObject = url_safe_base64_encode(object)** format. For example, object **panda.png** will be encoded as **cGFuZGEucG5n**.	image/resize,w_400/watermark,image_aW1h Z2UtZGVtby9sb2dvLnBuZz94LWltYWdlLXByb 2Nlc3M9aW1hZ2UvcmVzaXplLFBfMzA=,t_90, g_br,x_10,y_10
P	It indicates the percentage of the original image the image watermark will be scaled to. The value ranges from **1** to **100**. **NOTICE** **P** used here for resizing is case-sensitive. To adjust the size of an image watermark, see **Resizing Images** (except the **p** parameter).	image-demo/logo.png?x-image-process=image/resize,P_50

Examples of Making API Calls to Add Image Watermarks

- Use the watermark image **logo.png** (path: **hw-image-demo/logo.png**) and make the image watermark located at the bottom right, with a transparency of **90** and default horizontal and vertical margins of **10**.

  Relevant parameters:

  Watermark image: **hw-image-demo/logo.png**

  Safe Base64 code: **aHctaW1hZ2UtZGVtby9sb2dvLnBuZw==**

  Watermark position (bottom right): **g_br**

  Transparency: **t_90**

  Horizontal and vertical margins: **x_10,y_10**

  Request URL:

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/watermark,image_aHctaW1hZ2UtZGVtby9sb2dvLnBuZw==,g_br,t_90,x_10,y_10

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Figure 9-17 Example 1

- Use the watermark image **logo.png** (path: **hw-image-demo/logo.png**) and resize the image watermark by setting its width to **50**. Keep other parameters the same as those in the previous example.

  Relevant parameters:

  Watermark image: **hw-image-demo/logo.png?x-image-process=image/resize,w_50**

  Safe Base64 code: **aHctaW1hZ2UtZGVtby9sb2dvLnBuZz94LWltYWdlLXByb2Nlc3M9aW1hZ2UvcmVzaXplLHdfNTA=**

  Watermark position (bottom right): **g_br**

  Transparency: **t_90**

  Horizontal and vertical margins: **x_10,y_10**

  Request URL:

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/watermark,image_aHctaW1hZ2UtZGVtby9sb2dvLnBuZz94LWltYWdlLXByb2Nlc3M9aW1hZ2UvcmVzaXplLHdfNTA=,g_br,t_90,x_10,y_10

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Figure 9-18 Example 2

- Use the watermark image **logo.png** (path: **hw-image-demo/logo.png**) and resize the image watermark to 50 percent of the original image's size. Keep other parameters the same as those in the previous example.

  Relevant parameters:

  Watermark image: **hw-image-demo/logo.png?x-image-process=image/resize,P_50**

  Safe Base64 code: **aHctaW1hZ2UtZGVtby9sb2dvLnBuZz94LWltYWdlLXByb2Nlc3M9aW1hZ2UvcmVzaXplLFBfNTA=**

  Watermark position (bottom right): **g_br**

  Transparency: **t_90**

  Horizontal and vertical margins: **x_10,y_10**

  Request URL:

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/watermark,image_aHctaW1hZ2UtZGVtby9sb2dvLnBuZz94LWltYWdlLXByb2Nlc3M9aW1hZ2UvcmVzaXplLFBfNTA=,g_br,t_90,x_10,y_10

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Figure 9-19 Example 3

Example of Using the OBS Console GUI Mode to Add Image Watermarks

To add an image watermark to an image, you can create a watermark style on **OBS Console** and then apply it to the image. The following gives an example of creating a watermark style on OBS Console:

Step 1 Log in to **OBS Console** and click the required bucket name. In the navigation pane, choose **Data Processing** > **Image Processing**.

Step 2 Click **Create** to go to the style editing page.

Step 3 On the editing page, specify a style name, choose **GUI** for **Edit Mode**, and click **Watermark**.

NOTE

A style name consists of letters (uppercase or lowercase), digits, periods (.), underscores (_), and hyphens (-) and contains 1 to 256 characters, for example, **rotate_0001**.

Step 4 Configure the following watermark parameters.

- **Watermark Type**: Choose **Image watermark**.
- **Watermark Image Path**: Enter **e-share/image-demo/logo.png**.
- **Image Size (%)**: Set this parameter based on whether the watermark image is zoomed out.
- **Brightness**: Retain the default value **0**.
- **Contrast**: Retain the default value **0**.
- **Transparency**: Set this parameter to **90**.

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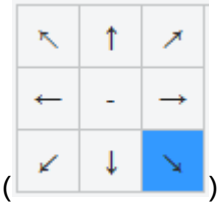
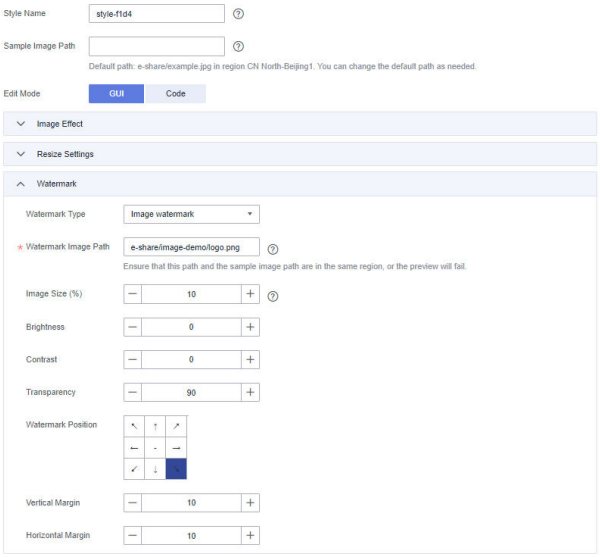


- **Watermark Position**: Select the arrow at the bottom right ( ).
- **Vertical Margin**: Retain the default value **10**.
- **Horizontal Margin**: Retain the default value **10**.

Figure 9-20 Configuring an image watermark



Step 5 Click **OK** to save the style. The new style will be displayed in the style list.

You can use the new watermark style to process images by referring to **Step 4: Using the Image Style**.

----End

Text Watermarks

You can configure the size, font, and color for text images. **Table 9-18** describes the parameters.

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Table 9-18 Text watermark parameters

Parameter	Value Description	Code Example
text	Mandatory for adding text watermarks **NOTICE** The content must be URL-safe Base64 encoded in the **encodeText = url_safe_base64_encode(fontText)** format, with a maximum of 64 characters (16 full-width characters at most).	image/watermark,text_SGVsbG8g5Zu- 54mH5pyN5YqhIQ,size_60,color_FF0000,type_ ZmFuZ3poZW5nc2h1c29uZw==,g_center,rotate_30
size	Optional. It represents the size of a text watermark, ranging from **0** (exclusive) to **1000** (inclusive). The default value is **40**.	
type	Optional. It represents the font of a text watermark. Available values are those shown in **Table 9-19**. The default value is **wqy-zenhei** (**d3F5LXplbmhlaQ** after encoding). **NOTICE** - The content must be URL-safe Base64 encoded in the **encodeText = url_safe_base64_encode(fontType)** format. - Line breaks are currently not supported.	
color	Optional. It represents the color of a text watermark. The value is a six-digit hexadecimal code, from **000000** (default value, representing black) to **FFFFFF**.	
shadow	Optional. It represents the transparency of a text watermark. The value ranges from **0** (exclusive) to **100** (inclusive).	
fill	Optional. It represents the filling effect of a text watermark. The value can be **0** or **1**. • **0**: filling not applied • **1**: filling applied	
rotate	Optional. It represents the clockwise rotation angle of a text watermark. The value ranges from **0** (exclusive) to **360** (exclusive).	

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Table 9-19 Text font encoding

Parameter	Value After URL-Safe Base64 Encoding	Value Description	Remarks
droidsansfallback	ZHJvaWRzYW5zZmFsbGJhY2s=	DroidSansFallback	According to Request for Comments (RFC), the fuller "=" can be omitted, and the value becomes **ZHJvaWRzYW5zZmFsbGJhY2s**.
fangzhengfangsong	ZmFuZ3poZW5nZmFuZ3Nvbmc=	FZFongSong	According to RFC, the fuller "=" can be omitted, and the value becomes **ZmFuZ3poZW5nZmFuZ3Nvbmc**.
fangzhengheiti	ZmFuZ3poZW5naGVpdGk=	FZSimHei	According to RFC, the fuller "=" can be omitted, and the value becomes **ZmFuZ3poZW5naGVpdGk**.
fangzhengkaiti	ZmFuZ3poZW5na2FpdGk=	FZKaiTi	According to RFC, the fuller "=" can be omitted, and the value becomes **ZmFuZ3poZW5na2FpdGk**.
fangzhengshusong	ZmFuZ3poZW5nc2h1c29uZw==	FZShuSong	According to RFC, the fuller "=" can be omitted, and the value becomes **ZmFuZ3poZW5nc2h1c29uZw**.
wqy-microhei	d3F5LW1pY3JvaGVp	WenQuanYi Micro Hei	-
wqy-zenhei	d3F5LXplbmhlaQ==	WenQuanYi Zen Hei	According to RFC, the fuller "=" can be omitted, and the value becomes **d3F5LXplbmhlaQ**.

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Examples of Making API Calls to Add Text Watermarks

- Add the text watermark **Hello** to an image, with the text size set to **60**, color to red, and font to FZShuSong.

  Relevant parameters:

  Safe Base64 code: **SGVsbG8g5Zu**, namely **text_SGVsbG8g5Zu**

  Text size: **size_60**

  Text color: **color_FF0000**

  Text font: **type_ZmFuZ3poZW5nc2h1c29uZw==**

  Request URL:

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/watermark,text_SGVsbG8g5Zu,size_60,color_FF0000,type_ZmFuZ3poZW5nc2h1c29uZw==

- Clockwise rotate a text watermark through an angle of 30 degrees and add it to the center of an image. Keep other parameters the same as those in the previous example.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/watermark,text_SGVsbG8g5Zu,size_60,color_FF0000,type_ZmFuZ3poZW5nc2h1c29uZw==,g_center,rotate_30

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- Add image and text watermarks at the same time. Add text watermark **Hello** at the bottom right, with the size set to **60**, shadow to **50**, and color to red.

  Add image watermark **logo.png**, with both horizontal and vertical margins set to **10**.

  Set the transparency of both text and image watermarks to **50** and put the image watermark in front and the text watermark behind, in the bottom alignment.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/watermark,image_aHctaW1hZ2UtZGVtby9sb2dvLnBuZw==,text_SGVsbG8g5Zu,size_60,color_FF0000,shadow_50,type_ZmFuZ3poZW5nc2h1c29uZw==,g_br,x_10,y_10,align_2,order_0

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- Add an image watermark first and then a text watermark. Add text watermark **Hello** at the bottom right, with the size set to **60** and color to red.

  Add image watermark **logo.png**, with a horizontal margin of **40** and a vertical margin of **10**.

  Set the transparency of the image watermark to **90**.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/watermark,image_aHctaW1hZ2UtZGVtby9sb2dvLnBuZw==,g_br,t_90,x_45,y_10/watermark,text_SGVsbG8g5Zu,size_60,color_FF0000,type_ZmFuZ3poZW5nc2h1c29uZw==,g_br,x_0,y_330

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Adding a Text Watermark in the GUI Mode on OBS Console

This case describes how to add a FZShuSong text watermark to the top left of an image in the GUI mode on **OBS Console**.

Step 1 In the bucket list of **OBS Console**, click the desired bucket to go to the **Objects** page.

Step 2 Click **Upload Object** to open the **Upload Object** dialog box.

Step 3 Click **add files** marked by red box in **Figure 9-21** to open the local file browser.

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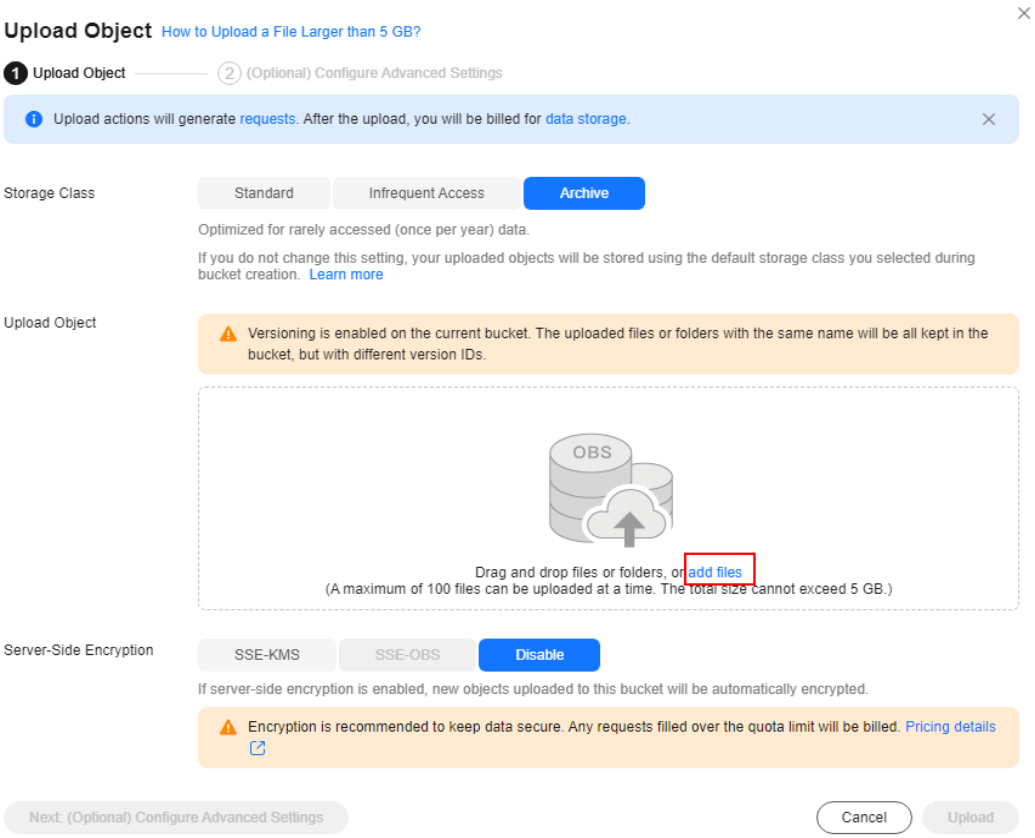
Figure 9-21 Uploading an image



Step 4 Select the image that you want to upload and click **Open**.

Step 5 Click **Upload** to upload the image. The uploaded image is displayed in the object list.

Step 6 In the navigation pane, choose **Data Processing** > **Image Processing**.

Step 7 Click **Create** to go to the style editing page shown in **Figure 9-22**.

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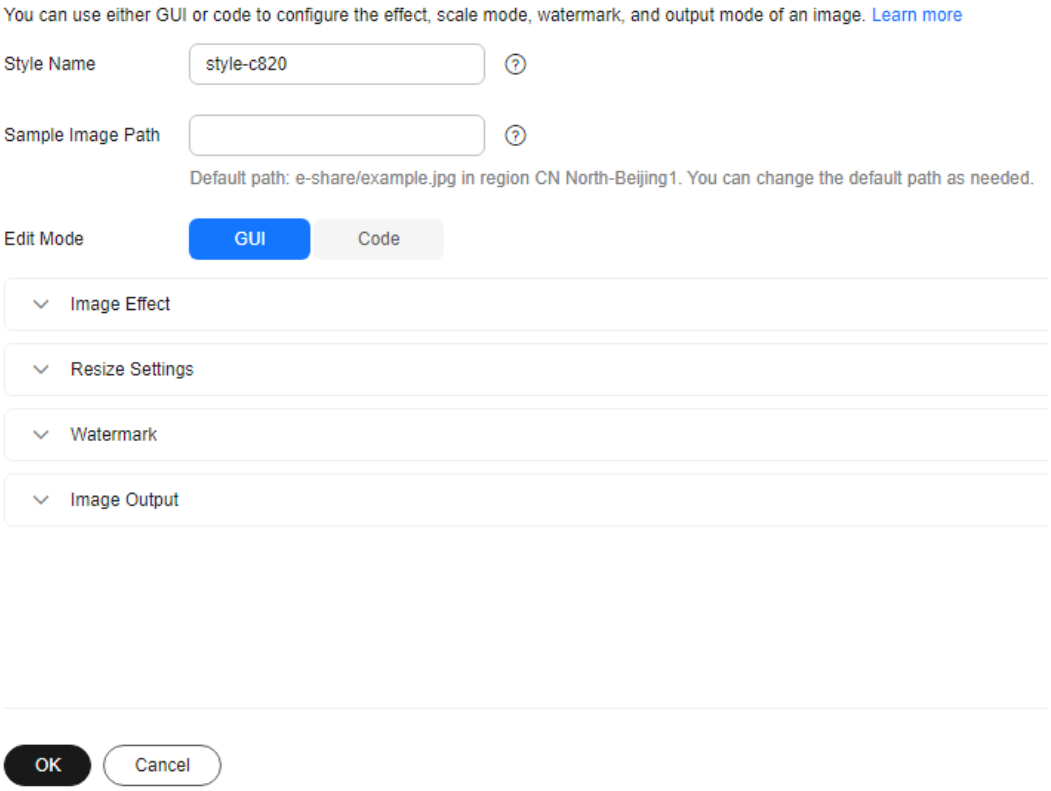
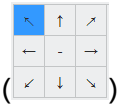
Figure 9-22 Creating a style



Step 8 Set **Style Name** to **obs-111** and choose **GUI** for **Edit Mode**.

Step 9 Expand **Watermark**.

1. Choose **Text watermark** for **Watermark Type**.
2. Specify **Content** to **Hello**.
3. Choose **FZShuSong** for **Text Font**.
4. Set **Text Size** to **600**.
5. Keep the default value **100** for **Watermark Transparency**.
6. Select the top left sign () for **Watermark Position**.
7. Keep **Text Shadow** ( ) disabled.
8. Keep the default value **10** for both **Vertical Margin** and **Horizontal Margin**.

The style effect will be displayed on the right in real time. **Figure 9-23** shows the final style effect.

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Figure 9-23 Effect of style **obs-111**

Step 10 Click **OK** to save the style. The new style **obs-111** will be displayed in the style list.

Step 11 In the navigation pane, choose **Objects**. Click **mountain.jpg** in the object list to go to the file details page.

Step 12 Click the **Preview Image** tab to preview the effect of the image with style **obs-111** applied.

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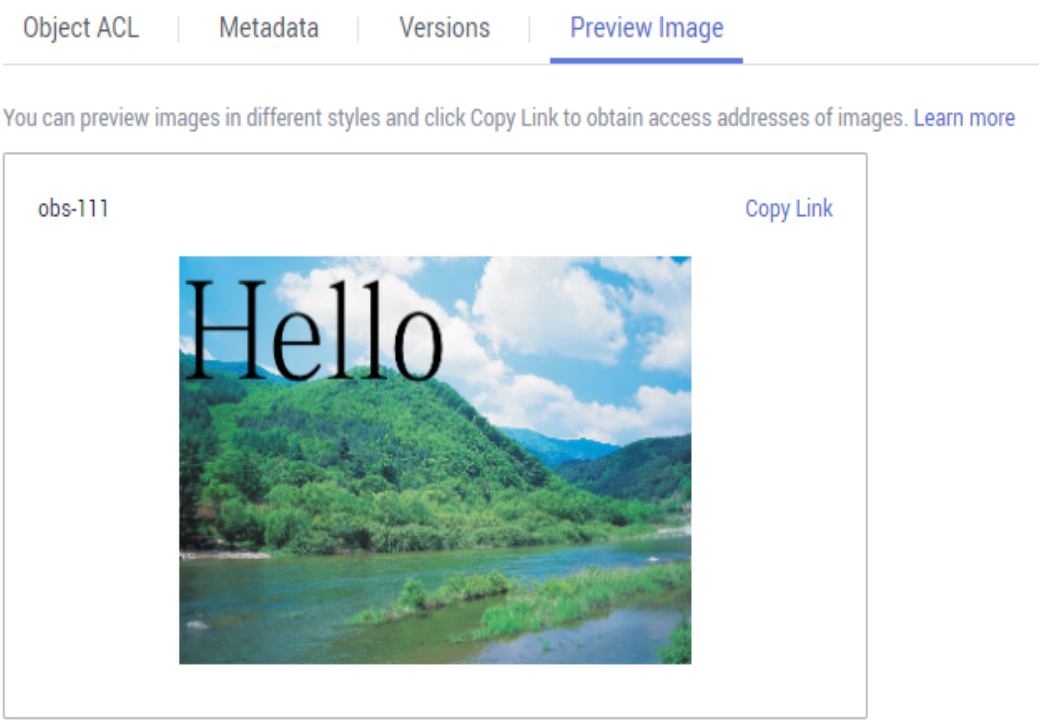
Figure 9-24 Preview Image



Step 13 In the image style card, click **Copy Link**. When **Copied successfully.** is prompted, you will have the address for accessing the image with the style applied.

----End

9.1.13 Converting Formats and Interlacing Images

Converting Formats

You can use the GUI or code mode on **OBS Console** or make an API call to convert images to different formats:

- Supported original formats: JPG, JPEG, PNG, BMP, WebP, GIF, and TIFF
- Supported target formats: JPG, PNG, BMP, and WebP (described in **Table 9-20**)

This operation is represented by **format**.

Table 9-20 Format conversion

Parameter	Value Description	Code Example
jpg	The image is saved in JPG format. If the original image is in vector format such as WebP, BMP, or PNG, the transparent part will be padded to white.	image/format,jpg

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Parameter	Value Description	Code Example
webp	The image is saved in WebP format.	image/format,webp
bmp	The image is saved in BMP format.	image/format,bmp
png	The image is saved in PNG format.	image/format,png

Example of Converting Formats

- Save a JPG image as a PNG image.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/format,png

Interlaced Image Loading

You can edit code on **OBS Console** or make an API call to load images in an interlaced way.

With format conversion, images are generated in baseline JPEG format by default. If you want to generate an image in progressive JPEG, use the **interlace** parameter. **Table 9-21** describes the parameters.

- Display of baseline JPG images: from top to bottom
- Display of progressive JPEG images: from blurry to clearer and clearer

This operation is represented by **interlace**.

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Table 9-21 Interlaced loading

Parameter	Value Description	Code Example
value	The value can be **0** or **1**. **0**: The output is a JPG image that is displayed from top to bottom. **1**: The output is a JPEG image in an interlaced display.	image/format,jpg/interlace,1

Examples of Interlaced Image Loading

- Create a JPG image in an interlaced display.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/format,jpg/interlace,1

- Create a JPG image that is displayed from top to bottom.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/format,jpg/interlace,0

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9.1.14 Changing Image Quality

You can edit code on **OBS Console** or make an API call to change the quality of a JPG or WebP image.

To save space, you can compress JPG images. **Table 9-22** describes the parameters.

This operation is represented by **quality**.

Table 9-22 Image compression parameters

Parameter	Value Description	Code Example
q	Relative quality of the image. The image is compressed to q% of the original. The value ranges from **1** to **100**. Formula for compression: Target quality = Original quality × q% For example, if the original image quality is 100% and the relative quality is 80%, then the target image quality is 80%. If the original quality is 80% and the relative quality is 80%, then the target quality is 64%.	image/ resize,w_100,h_100/ quality,q_80

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Parameter	Value Description	Code Example
Q	Absolute quality of the image. The image is compressed into Q%. Q is irrelevant to and does not depend on the original image. The value ranges from **1** to **100**. Formulas for compression: • Original quality > Q%: target quality = Q% • Original quality = Q%: target quality = original quality = Q% • Original quality < Q%: target quality = original quality For example, if the original image quality is 100% and the absolute quality is 80%, then the target image quality is 80%. If the original quality is 70% and the absolute quality is 80%, then the target quality is 70%.	

NOTE

- **q** is valid only for JPG images.
- If both **q** and **Q** are used, the output is based on **Q**.

Examples

- Resize the image by setting the height and width both to **100** and generate a JPG image with a relative quality of 80%.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,w_100,h_100/quality,q_80

- Resize the image by setting the height and width both to **100** and generate a JPG image with an absolute quality of 80%.

  https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,w_100,h_100/quality,Q_80

9.1.15 Slimming Images

You can edit code on **OBS Console** or make an API call to slim images.

Slimming is a simplified image compression, which generates images with an absolute quality of 75%. You do not need to configure any parameter. You can slim images just by running a command.

This operation is represented by **imageslim**.

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NOTE

- Only JPG images can be slimmed.
- It is recommended that you slim images after other image processing operations.

Example

Resize an image by setting the width and height both to **100** and then slim the resized image.

- Original image: **https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg**

- Resize the image by setting the width and height both to **100** using the code image/resize,w_100,h_100.
- Slim the image using the code imageslim.

Resizing and slimming

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,w_100,h_100/imageslim

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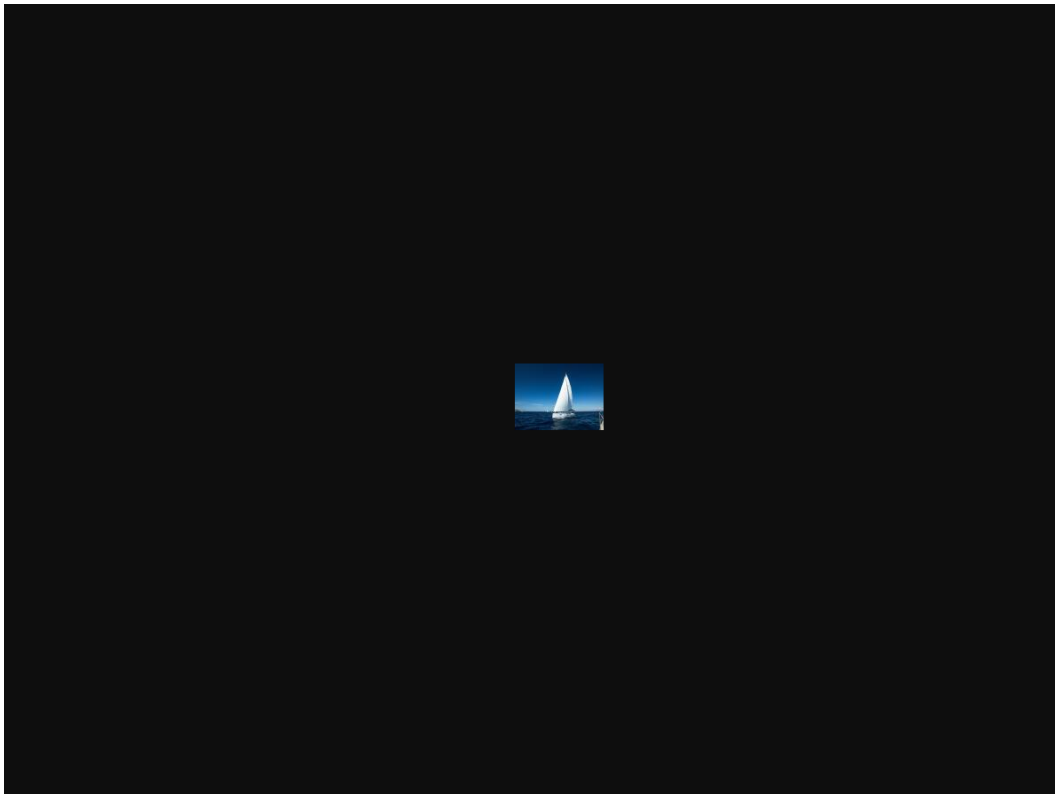
Figure 9-25 Image after being resized and slimmed



9.1.16 Image Processing Persistency

Image processing persistency allows the images after processing to be synchronously stored in a specified OBS bucket, so that you can directly access the stored images to save time.

You can use image processing persistency only by making API calls. In an image processing request, the persistency should be configured in the *Parameter name*=*Parameter value* format. **Table 9-23** describes the parameters.

Table 9-23 Image processing persistency parameters

Parameter	Value	Description
x-image-save-object	*objectName*	Mandatory It specifies the name of the processed image that will be stored in the bucket. An object name: • cannot contain the following special characters: \ : * ? " < > | • must be 1 to 1023 characters long.

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Parameter	Value	Description
x-image-save-bucket	*bucketName*	Optional It specifies the bucket that will store the processed image. If this parameter is not specified, the processed image will be saved in the bucket where the original image is processed. The bucket must be an existing one in OBS and its name must be 1 to 64 characters long.

Java Sample Code

```
ObsClient obsClient = null;
String endPoint = "obs-endpoint";  // Current region
// Hard-coded or plaintext AK and SK are risky. For security purposes, encrypt your AK and SK and store them in the configuration file or environment variables.
// In this example, the AK and SK are stored in environment variables for identity authentication. Before running this example, configure environment variables ACCESS_KEY_ID and SECRET_ACCESS_KEY.
// Obtain an AK and SK pair on the management console. For details, see https://support.huaweicloud.com/intl/en-us/usermanual-ca/ca_01_0003.html.
String ak = System.getenv("ACCESS_KEY_ID");
String sk = System.getenv("SECRET_ACCESS_KEY");
try {
    ObsConfiguration config = new ObsConfiguration();
    config.setEndPoint(endPoint);
    obsClient = new ObsClient(ak,sk ,config);
    TemporarySignatureRequest request = new TemporarySignatureRequest();
    request.setObjectKey("test.jpeg");  // Original object name before processing
    Map<String, Object> queryParams = new HashMap<>();
    queryParams.put("x-image-process", "image/resize,w_100");
    String objectName = "your saves objectName";  // Name of the processed object
    // Optional parameters
    String bucketName = "your saves Bucket";  // Bucket that stores the processed object
    queryParams.put("x-image-save-object",
Base64.getUrlEncoder().encodeToString(objectName.getBytes(StandardCharsets.UTF_8)));
    queryParams.put("x-image-save-bucket",
Base64.getUrlEncoder().encodeToString(bucketName.getBytes(StandardCharsets.UTF_8)));
    request.setQueryParams(queryParams);
    request.setBucketName("your bucket");  // Bucket that stores the original object
    TemporarySignatureResponse response = obsClient.createTemporarySignature(request);
    //URL to access
    response.getSignedUrl();
 } catch (Exception e) {
...//Handle exceptions.
 } finally {
     if (obsClient != null) {
         obsClient.close();
      }
 }
```

Python Sample Code

```
from obs import ObsClient
import os
import traceback
import requests
import base64

# Obtain an AK and SK pair using environment variables or import the AK and SK pair in other ways. Using hard coding may result in leakage.
# Obtain an AK and SK pair on the management console. For details, see https://support.huaweicloud.com/intl/en-us/usermanual-ca/ca_01_0003.html.
ak = os.getenv("AccessKeyID")
```

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```
sk = os.getenv("SecretAccessKey")
# (Optional) If you use a temporary AK and SK pair and a security token to access OBS, obtain them from environment variables.
security_token = os.getenv("SecurityToken")
# Set server to the endpoint corresponding to the bucket. CN-Hong Kong (ap-southeast-1) is used here as an example. Replace it with the one in use.
server = "https://obs.ap-southeast-1.myhuaweicloud.com"
# Create an ObsClient instance.
# If you use a temporary AK and SK pair and a security token to access OBS, you must specify security_token when creating an instance.
obsClient = ObsClient(access_key_id=ak, secret_access_key=sk, server=server)
try:
    # Generate a signed URL for image persistency.
    # Name of the bucket that stores the original object
    bucketName = 'originBucketName';
    # Original object name
    objectKey = 'test.png';

    # Name of the object after processing
    targetObjectName ="save.png"
    # (Optional) Name of the bucket that stores the new object
    targetBucketName ="saveBucketName"
    queryParams={}
    queryParams["x-image-process"]="image/resize,w_100"
    queryParams["x-image-save-object"]=base64.urlsafe_b64encode(targetObjectName.encode()).decode()
    # Optional parameter
    queryParams["x-image-save-bucket"]=base64.urlsafe_b64encode(targetBucketName.encode()).decode()

    res = obsClient.createSignedUrl(method='GET', bucketName=bucketName, objectKey=objectKey, queryParams=queryParams, expires=3600)
    print('signedUrl:', res.signedUrl)
    print('actualSignedRequestHeaders:', res.actualSignedRequestHeaders)
    // Make a GET request for image persistency.
    r = requests.get(resp.signedUrl)
    print(r)
except:
    print(traceback.format_exc())
```

Node.js Sample Code

```
// Import the OBS library.
const ObsClient = require('esdk-obs-nodejs');
const https = require('https');
const http = require('http');
const urlLib = require('url');

// Hard-coded or plaintext AK and SK are risky. For security purposes, encrypt your AK and SK and store them in the configuration file or environment variables.
// In this example, the AK and SK are stored in environment variables for identity authentication. Before running this example, configure environment variables ACCESS_KEY_ID and SECRET_ACCESS_KEY.
// Obtain an AK and SK pair on the management console. For details, see https://support.huaweicloud.com/intl/en-us/usermanual-ca/ca_01_0003.html.
const ak = process.env.ACCESS_KEY_ID;
const sk = process.env.SECRET_ACCESS_KEY;
const server = "obs-endpoint";  // Current region

// Create an ObsClient instance.
const obsClient = new ObsClient({
    access_key_id: ak,
    secret_access_key: sk,
    server: server
});

// Name of the bucket that stores the original object
const bucketName = 'originBucketName';
// Original object name
const objectKey = 'test.png';
const method = 'GET';
```

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```
// Name of the object after processing
const targetObjectName = "save.png";
// (Optional) Name of the bucket that stores the new object
const targetBucketName = 'saveBucketName';

// Base64 encoding
function encodeBase64Url(str) {
  return Buffer.from(str, 'utf8')
    .toString('base64')
    .replace(/\+/g, '-')
    .replace(/\//g, '_')
    .replace(/=+$/g, '')
}

const queryParams = {
    "x-image-process": "image/resize,w_100",
    "x-image-save-object": encodeBase64Url(targetObjectName),
    // Optional parameter
    "x-image-save-bucket": encodeBase64Url(targetBucketName)
}

const res = obsClient.createSignedUrlSync({
    Method: method,
    Bucket: bucketName,
    Key: objectKey,
    QueryParams: queryParams
});

// Make a GET request for image persistency.
const url = urlLib.parse(res.SignedUrl);
const request = server.startsWith('http://') ? http : https;
const req = request.request({
    method: method,
    host: url.hostname,
    port: url.port,
    path: url.path,
    rejectUnauthorized: false,
    headers: res.ActualSignedRequestHeaders || {}
});
```

PHP Sample Code

```
// Import the dependency library.
require 'vendor/autoload.php';
// Import the SDK code library during the installation with source code.
// require 'obs-autoloader.php';
// Declare the namespace.
use Obs\ObsClient;
use GuzzleHttp\Client;
use GuzzleHttp\Exception\ClientException;
// Create an ObsClient instance.
$obsClient = new ObsClient ( [
    //Obtain an AK and SK pair using environment variables or import an AK and SK pair in other ways.
Using hard coding may result in leakage.
    //Obtain an AK/SK pair on the management console. For details, see https://support.huaweicloud.com/
intl/en-us/usermanual-ca/ca_01_0003.html.    'key' => getenv('ACCESS_KEY_ID'),
    'secret' => getenv('SECRET_ACCESS_KEY'),
    'endpoint' => 'https://your-endpoint',
    'signature' => 'obs'
] );

function base64url_encode($data) {
    $base64 = base64_encode($data);
    $base64url = strtr($base64, '+/', '-_');
    return rtrim($base64url, '=');
}

// Name of the bucket that stores the original object
$bucketName = 'originBucketName';
```

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```
// Original object name
$objectKey = 'test.png';
$method = 'GET';
// Name of the object after processing
$targetObjectName = "save.png";
// (Optional) Name of the bucket that stores the new object
$targetBucketName = 'saveBucketName';
// Specify the validity period of the URL to 3,600 seconds.
$expires = 3600;
// Download the object.
$resp = $obsClient->createSignedUrl( [
    'Method' => $method,
    'Bucket' => bucketname,
    'Key' => $objectKey,
    'Expires' => $expires,
    'QueryParams' => [
        "x-image-process" => 'image/resize,w_100',
        'x-image-save-object' => base64url_encode($targetObjectName),
        'x-image-save-bucket' => base64url_encode($targetBucketName)
    ]
] );
printf("SignedUrl:%s\n", $resp ['SignedUrl']);
$url = $resp['SignedUrl'];
$httpClient = new Client(['verify' => false ]);

try{
    $response = $httpClient -> request('GET', $url, ['headers'=> $resp['ActualSignedRequestHeaders']]);
    printf("%s using temporary signature url:\n", 'Get object');
    printf("\t%s successfully.\n", $url);
    printf("\tStatus:%d\n", $response -> getStatusCode());
    printf("\tContent:%s\n", $response -> getBody() -> getContents());
    $response -> getBody()-> close();
}catch (ClientException $ex){
    printf("%s using temporary signature url:\n", 'Get object');
    printf("\t%s failed!\n", $url);
    printf('Exception message:%s', $ex ->getMessage());
}
```

NOTE

- Object and bucket names must be URL-safe Base64 encoded in the **encodedObject = url_safe_base64_encode(name)** format. For example, object **panda.png** will be encoded as **cGFuZGEucG5n**. After Base64 encoding, if the name contains plus signs (+) and slashes (/), replace them with hyphens (-) and underscores (_), respectively.
- If a signature matching error is reported, check whether the AK and SK pair is correct and whether the accessed URL is the same as the signature URL generated by the code.
- Currently, image persistency with the range header is not supported.

9.1.17 Removing Image Metadata

You can edit code on **OBS Console** or make an API call.

The following operation is used to remove image metadata.

This operation is represented by **strip**.

Example

Remove image metadata.

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/strip

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9.1.18 Ignoring Errors and Returning Original Images

You can edit code on **OBS Console** or make an API call.

The following operation will ignore errors such as invalid request parameters and excessive image processing, and directly return the original images.

This operation is represented by **ignore-error**.

Table 9-24 Parameter description

Parameter	Value Description	Code Example
value	The value can be **0** (default) or **1**. If the value is set to **0**, errors will not be ignored. If there is an error, the server returns an error message. If the value is set to **1**, errors will be ignored. If an error occurs, for example, the request parameter is invalid or the image processing exceeds the limit, the server ignores the error and returns the original image.	image/ignore-error,1

Example

Ignore errors.

https://hw-image-demo.obs.ap-southeast-1.myhuaweicloud.com/example.jpg?x-image-process=image/resize,h_10000,h_10000/ignore-error,1

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Figure 9-26 Returned original image when there is an invalid parameter

9.2 Online Decompression

You can compress files into a ZIP package, upload it to OBS for auto decompression online, and store it in a specified directory.

Uploading a large number of small files at a time by using a ZIP package saves time and efforts. For batch upload constraints, see **OBS Batch Upload**.

If the package you uploaded matches the configured decompression policy, it will be automatically decompressed upon upload. A decompression policy does not apply to the ZIP packages that already exist in OBS before the policy is created.

You can create online decompression policies or replicate existing policies from another bucket.

Prerequisites

You have been assigned the **Tenant Administrator** role.

Constraints

Permissions

- To configure, obtain, or delete online decompression policies, you must have the **Tenant Administrator** permission assigned by using IAM.
- Online decompression requires that you create an IAM agency to delegate OBS to access data in the bucket. The permissions the agency should assign

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to OBS include **obs:object:PutObject**, **obs:object:GetObject**, and **obs:object:AbortMultipartUpload**.

Package and file size

- A single ZIP package cannot exceed **1 GB** in size.
- A single ZIP package can contain a maximum of 65,536 files.
- A single decompressed file cannot exceed 40 GB in size.

Time

- Decompressing a ZIP package takes 10 minutes at most.

Functions

- Currently, only ZIP packages are supported.
- ZIP package names cannot contain Chinese punctuation marks, special characters, or special codes.
- To decompress the ZIP package that contains other ZIP packages, the event type of the online decompression policy must be set to **ObjectCreated:*** or **ObjectCreated:CompleteMultipartUpload**.
- Currently, no notification will be sent to users after decompression tasks are complete.
- Currently, only deflate-compressed ZIP packages can be decompressed. Deflate is different from the compression algorithms (such as Store and Normal) provided by WinRAR.
- The total length of the decompression path plus the name of any decompressed file cannot exceed 512 characters.
- Currently, encrypted ZIP packages cannot be decompressed.
- Federated users cannot use the online decompression function. For more information about federated users, see **What Are the Relationships Between a Huawei Cloud Account, HUAWEI ID, IAM User, and Federated User?** and **Identity Providers**.

Precautions

- You are advised to set a precise prefix for a decompression policy. In the same bucket, trigger conditions (including events, prefixes, or suffixes) of different decompression policies cannot overlap with each other.

  For example, there are two decompression policies **event-0001** and **event-0002** in a bucket. If the prefix of **event-0001** is **aa**, the prefix of **event-0002** cannot be **aaaa**, because **aa** is contained in **aaaa**.
- If the prefix is left blank, the decompression policy applies to all the ZIP packages in the bucket by default. This may trigger cyclic decompression if a package contains other packages.

  For example, package **AA.zip** contains another package **BB.zip**. If the prefix is left blank, the system continues to decompress **BB.zip** after decompressing **AA.zip**. This issue will not happen if a prefix is set in the policy.
- You must set a directory for storing the decompressed files. If the directory is not set, decompressed files will be stored in the home directory of the current bucket.

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- You are advised to encode file or folder names using UTF-8. Otherwise, names of decompressed files or folders may contain garbled characters, or the decompression may be interrupted.
- If you want ZIP packages in the Archive storage class to be automatically decompressed upon upload, ensure that Direct Reading has been enabled for the bucket. ZIP packages in the Deep Archive storage class will not be automatically decompressed after they are uploaded to an OBS bucket.
- A ZIP package decompression will fail if it takes more than 10 minutes.

Creating an Online Decompression Policy

You can use **OBS Console** or APIs to create an online decompression policy.

Using OBS Console

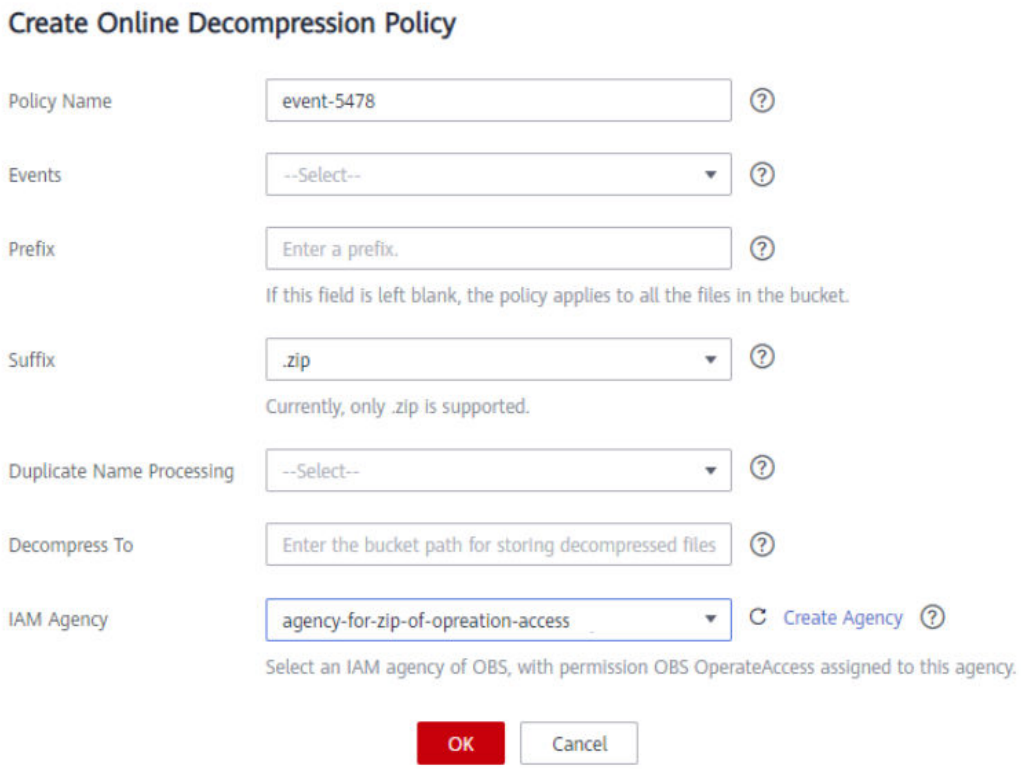
Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Data Processing** > **Online Decompression**. The **Online Decompression** page is displayed.

Step 4 Click **Create**.

Figure 9-27 Creating an online decompression policy



Step 5 Configure the online decompression policy. **Table 9-25** describes the related parameters.

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Table 9-25 Parameter description

Parameter	Description
Policy Name	Enter a policy name that is easy to remember. The value can contain 1 to 256 characters, and only uppercase letters, lowercase letters, digits, underscores (_), and hyphens (-) are allowed, for example, **event_0001**.
Events	Events that you want to trigger the online decompression policy for. Currently, the following event types are supported: • **ObjectCreated**: all object creation operations, including PUT, POST, COPY, and part assembling • **Put**: object upload using PUT • **Post**: object upload using POST • **Copy**: object copying using COPY • **CompleteMultipartUpload**: assembling of parts in a multipart upload **NOTE** To decompress the ZIP package that contains other ZIP packages, set the event type to **ObjectCreated** or **CompleteMultipartUpload**.
Prefix	Optional. If this parameter is configured, the decompression policy applies to the packages whose name contains this prefix. The prefix cannot start with a slash (/) or contain double slashes (//), or contain special characters (\ : * ? " < > |). The total length of the prefix and suffix cannot exceed 512 characters. • With this parameter configured, ZIP packages whose name contains the specified prefix will trigger online decompression. • With this parameter left blank, the decompression policy applies to all the uploaded ZIP packages. **CAUTION** – You are advised to configure a prefix. Otherwise, cyclic decompression may occur if a package contains other packages. – The configured prefix must contain all levels of the directory for storing the object. For example, there is an object **example123** that is stored under **bucket/file/example123**. If you want **example** to be the prefix, set the prefix to **file/example**.
Suffix	If this parameter is specified, the decompression policy applies to the packages whose name contains this suffix. Currently, **.zip** is the default and only value.

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Parameter	Description
Duplicate Name Processing	It specifies how the decompressed objects are processed if they have the same names as the existing objects in the bucket. • **Do not decompress**: Retains the existing objects, and does not decompress the objects with the same name. • **Rename the file**: Renames the decompressed objects with the CRC32 value. • **Overwrite**: Overwrites the existing objects in the bucket.
Decompress To	Optional, this parameter specifies the path for storing decompressed files. It cannot contain special characters (\:*?\"<>|), start or end with a period (.), or contain two or more consecutive slashes (/). The value can contain 0 to 1,023 characters. • With this parameter configured, the path must end with a slash (/). After a ZIP package is decompressed, the decompressed files are stored in the folder with the same name as the path. If there is no such a folder in the bucket, OBS automatically creates one for storing the files. • With this parameter left blank, decompressed objects are stored in the home directory of the bucket.
IAM Agency	Select an IAM agency of OBS, with the **OBS OperateAccess** permission assigned. If no such agency is available, create one.

Step 6 Click **OK**. The online decompression policy is created.

----End

Using APIs

Setting an Online Decompression Policy

Replicating Online Decompression Policies

You can use **OBS Console** to replicate online decompression policies.

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Data Processing** > **Online Decompression**. The **Online Decompression** page is displayed.

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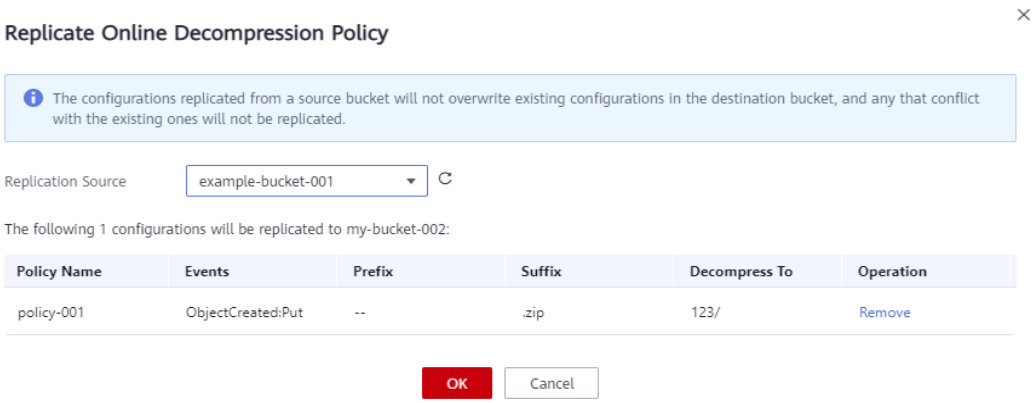
Step 4 Click **Replicate**.

Step 5 Select a replication source, which is the bucket whose online decompression policies you want to replicate.

NOTE

- The online decompression policies replicated from a source bucket will not overwrite existing policies in the destination bucket, and any that conflict with the existing ones will not be replicated.
- Both source and destination buckets must be of the 3.0 version.
- You can remove the policies that you do not want to replicate.
- There can be 10 online decompression policies at most in a bucket. If the number of policies you will replicate plus the number of existing policies in the destination bucket exceeds 10, the replication will fail. Before replicating the policies, delete some if necessary.

Figure 9-28 Replicating online decompression policies



Step 6 Click **OK** to replicate the online decompression policies to the destination bucket.

----End

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10 Monitoring and Logging

10.1 Using Cloud Eye to Monitor OBS Buckets

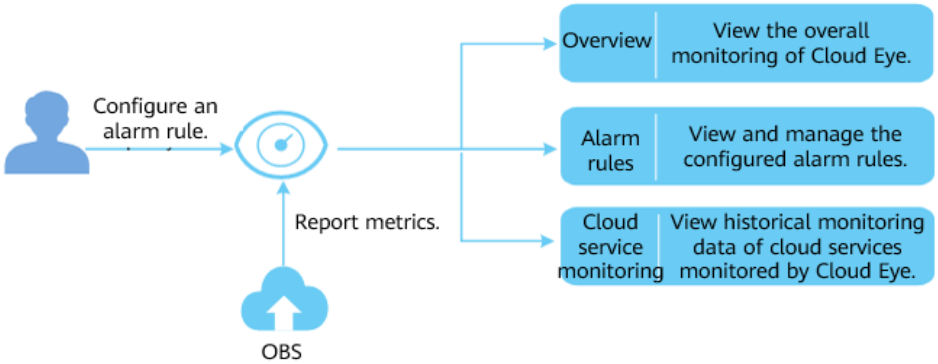
10.1.1 Monitoring OBS

Scenarios

In the use of OBS, you may send PUT and GET requests that generate upload and download traffic, or receive error responses from the server. Huawei Cloud provides Cloud Eye to help you monitor OBS and better understand your bucket statuses. To keep informed of the requests, traffic, and error responses in a timely manner, you can use Cloud Eye to perform automatic and real-time monitoring over your buckets.

You do not need to separately subscribe to Cloud Eye. It starts automatically once you create a resource (a bucket, for example) in OBS. For more information about Cloud Eye, see **What Is Cloud Eye?**

Figure 10-1 Cloud Eye monitoring



Setting Alarm Rules

In addition to automatic and real-time monitoring, you can configure alarm rules in Cloud Eye to receive alarm notifications when there are exceptions.

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For details about how to configure alarm rules for monitoring over OBS, see **Creating an Alarm Rule**.

On Cloud Eye, you can configure alarm rules for events. When specified events happen, you will receive alarm notifications. For details, see **Creating an Alarm Rule and Notification for Event Monitoring**.

Viewing OBS Monitoring Metrics

Cloud Eye monitors **OBS metrics** in real time. You can view monitoring details of each metric on the console of Cloud Eye.

For details about how to view OBS monitoring metrics, see **Viewing a Cloud Service Dashboard**.

Cloud Eye monitors **OBS events** in real time. You can view the monitoring data on the Cloud Eye console. For details, see **Viewing Event Monitoring Data**.

10.1.2 OBS Monitoring Metrics

Functions

This section defines the namespace, list, and dimensions of monitoring metrics reported by OBS to Cloud Eye. You can use the **Cloud Eye console** or **API** to search for monitoring metrics and alarms generated by OBS.

NOTE

Cloud Eye can monitor dimensions nested to a maximum depth of four levels (levels 0 to 3). 3 is the deepest level. For example, if the monitored dimension of a metric is **bucket_name,api_name**, **bucket_name** indicates level 0 and **api_name** indicates level 1.

Namespace

SYS.OBS

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Monitoring Metrics

Table 10-1 OBS metrics (for requests)

Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
get_request_count	GET Requests	Number of GET requests made to all buckets and objects in the buckets of a region.	≥ 0	Count	N/A	bucket_name	1 minute
put_request_count	PUT Requests	Number of PUT requests made to all buckets and objects in the buckets of a region.	≥ 0	Count	N/A	bucket_name	1 minute
post_request_count	POST Requests	Number of POST requests made to all buckets and objects in the buckets of a region.	≥ 0	Count	N/A	bucket_name	1 minute
head_request_count	HEAD Requests	Number of HEAD requests made to all buckets and objects in the buckets of a region.	≥ 0	Count	N/A	bucket_name	1 minute
delete_request_count	DELETE Requests	Number of DELETE requests made to all buckets and objects in the buckets of a region.	≥ 0	Count	N/A	bucket_name	1 minute
first_byte_latency	First Byte Download Delay	Average time from receiving a GET request to the time that the system starts to respond in a measurement period.	≥ 0	ms	N/A	bucket_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
request_count_4xx	4XX Status Codes	Number of requests whose status code returned by the server is 4*xx*.	≥ 0	Count	N/A	tenant_id bucket_name bucket_name, api_name	1 minute
request_count_5xx	5XX Status Codes	Number of requests whose status code returned by the server is 5*xx*.	≥ 0	Count	N/A	tenant_id bucket_name bucket_name, api_name	1 minute
total_request_latency	Average Request Latency	Average time from receiving a request to the time that the system response ends in a measurement period.	≥ 0	ms	N/A	tenant_id bucket_name bucket_name, api_name	1 minute
total_request_callback_latency	Average Request Callback Latency	Average time required for calling a specific API in a request.	≥ 0	ms	N/A	bucket_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
request_count_per_second	Total TPS	Average number of requests per second in a statistical period.	≥ 0	Count/s	N/A	tenant_id bucket_name bucket_name, domain_name	1 minute
request_count_get_per_second	GET Request TPS	Average number of GET requests per second in a statistical period.	≥ 0	Count/s	N/A	tenant_id bucket_name bucket_name, domain_name	1 minute
request_count_put_per_second	PUT Request TPS	Average number of PUT requests per second in a statistical period.	≥ 0	Count/s	N/A	tenant_id bucket_name bucket_name, domain_name	1 minute
request_count_delete_per_second	DELETE Request TPS	Average number of DELETE requests per second in a statistical period.	≥ 0	Count/s	N/A	tenant_id bucket_name bucket_name, domain_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
request_count_post_per_second	POST Request TPS	Average number of POST requests per second in a statistical period.	≥ 0	Count/s	N/A	tenant_id bucket_name bucket_name, domain_name	1 minute
request_count_head_per_second	HEAD Request TPS	Average number of HEAD requests per second in a statistical period.	≥ 0	Count/s	N/A	tenant_id bucket_name bucket_name, domain_name	1 minute
request_success_rate	Request Success Rate	Used to measure the availability of the storage service system. It refers to the percentage of non-server error requests (with status code 5*xx* returned) in the total request count. It is calculated as follows: (1 – 5*xx* requests/ Total requests) x 100%	≥ 0, ≤ 100	%	N/A	tenant_id bucket_name bucket_name, api_name bucket_name, domain_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
effective_request_rate	Valid request rate	Validity of client requests. Percentage of the valid requests in the total requests. It is calculated as follows: (Number of client requests whose returned status code is 2*xx* or 3*xx*/Total number of requests) x 100%	≥ 0, ≤ 100	%	N/A	tenant_id bucket_name bucket_name, api_name	1 minute
request_break_rate	Request interruption rate	Percentage of the number of requests interrupted by a client to the total number of requests. It is calculated as follows: (Number of requests interrupted by a client/Total number of requests) x 100%	≥ 0, ≤ 100	%	N/A	tenant_id bucket_name bucket_name, api_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
request_code_count	HTTP status code count	Measures the number of requests with status codes returned by the server. For details about the response status codes, see **HTTP Status Codes**.	≥ 0	Count	N/A	bucket_name bucket_name,api_name bucket_name,http_code bucket_name,api_name,http_code	1 minute
api_request_count_per_second	API request TPS	Average number of specific API requests sent to all buckets and objects of a tenant per second within a statistical period. For details about the supported APIs, see **Request APIs**.	≥ 0	Count/s	N/A	bucket_name bucket_name,api_name	1 minute
request_count_monitor_2XX	2xx Status Codes	Times that the server responds to requests whose status codes are 2*xx*.	≥ 0	Count	N/A	tenant_id bucket_name bucket_name,domain_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
request_count_monitor_3XX	3xx Status Codes	Times that the server responds to requests whose status codes are 3*xx*.	≥ 0	Count	N/A	tenant_id bucket_name bucket_name, domain_name	1 minute
request_count_monitor_4XX	4XX Status Codes	Times that the server responds to requests whose error codes are 4*xx*	≥ 0	Count	N/A	tenant_id bucket_name bucket_name, domain_name	1 minute
request_count_monitor_5XX	5XX Status Codes	Times that the server responds to requests whose error codes are 5*xx*	≥ 0	Count	N/A	tenant_id bucket_name bucket_name, domain_name	1 minute
download_bytes	Total Download Bandwidth	Total size of objects downloaded per second in a measurement period.	≥ 0	byte/s	1024 (IEC)	tenant_id bucket_name bucket_name, domain_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
download_bytes_extranet	Download Bandwidth (Internet)	Total size of objects downloaded over the Internet per second in a measurement period.	≥ 0	byte/s	1024 (IEC)	tenant_id bucket_name bucket_name, domain_name	1 minute
download_bytes_intranet	Download Bandwidth (Intranet)	Total size of objects downloaded over the Intranet per second in a measurement period.	≥ 0	byte/s	1024 (IEC)	tenant_id bucket_name bucket_name, domain_name	1 minute
upload_bytes	Total Upload Bandwidth	Total size of objects uploaded per second in a measurement period.	≥ 0	byte/s	1024 (IEC)	tenant_id bucket_name bucket_name, domain_name	1 minute
upload_bytes_extranet	Upload Bandwidth (Internet)	Total size of objects uploaded over the Internet per second in a measurement period.	≥ 0	byte/s	1024 (IEC)	tenant_id bucket_name bucket_name, domain_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
upload_bytes_intranet	Upload Bandwidth (Intranet)	Total size of objects uploaded over the Intranet per second in a measurement period.	≥ 0	byte/s	1024 (IEC)	tenant_id bucket_name bucket_name, domain_name	1 minute
cdn_bytes	CDN Pull Bandwidth	The object size that CDN pulls per second from an origin server over the Internet in a given measurement period.	≥ 0	Byte/s	1024 (IEC)	tenant_id bucket_name	1 minute
download_traffic	Total Download Traffic	Total size of objects downloaded in a measurement period.	≥ 0	byte	1024 (IEC)	tenant_id bucket_name bucket_name, domain_name	1 minute
download_traffic_extranet	Download Traffic (Internet)	Total size of objects downloaded over the Internet in a measurement period.	≥ 0	byte	1024 (IEC)	tenant_id bucket_name bucket_name, domain_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
download_traffic_intranet	Download Traffic (Intranet)	Total size of objects downloaded over the Intranet in a measurement period.	≥ 0	byte	1024 (IEC)	tenant_id bucket_name bucket_name, domain_name	1 minute
download_traffic_infrequent_access	Download Traffic (Infrequent Access)	Total size of Infrequent Access objects downloaded in a measurement period.	≥ 0	Byte	1024 (IEC)	tenant_id bucket_name	1 minute
upload_traffic	Total Upload Traffic	Total size of objects uploaded in a measurement period.	≥ 0	byte	1024 (IEC)	tenant_id bucket_name bucket_name, domain_name	1 minute
upload_traffic_extranet	Upload Traffic (Internet)	Total size of objects uploaded over the Internet in a measurement period.	≥ 0	byte	1024 (IEC)	tenant_id bucket_name bucket_name, domain_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
upload_traffic_intranet	Upload Traffic (Intranet)	Total size of objects uploaded over the Intranet in a measurement period.	≥ 0	byte	1024 (IEC)	tenant_id bucket_name bucket_name, domain_name	1 minute
cdn_traffic	CDN Pull Traffic	The total traffic generated when CDN pulls data from an origin server over the Internet in a given measurement period	≥ 0	Byte	1024 (IEC)	tenant_id bucket_name	1 minute
upload_transfer_rate	Average Upload Rate	Size of objects uploaded per second in a measurement period.	≥ 0	Bytes/s	1024 (IEC)	bucket_name	1 minute
download_transfer_rate	Average Download Rate	Size of objects downloaded per second.	≥ 0	Bytes/s	1024 (IEC)	bucket_name	1 minute
request_get_size_le_1MB_latency	GET Request Latency (Object ≤ 1 MB)	Average latency of GET requests against objects no larger than 1 MB in a measurement period.	≥ 0	ms	N/A	bucket_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
request_get_size_between_1MB_4MB_latency	GET Request Latency (1 MB < Object ≤ 4 MB)	Average latency of GET requests against objects that are larger than 1 MB but no larger than 4 MB in a measurement period.	≥ 0	ms	N/A	bucket_name	1 minute
request_get_size_between_4MB_10MB_latency	GET Request Latency (4 MB < Object ≤ 10 MB)	Average latency of GET requests against objects that are larger than 4 MB but no larger than 10 MB in a measurement period.	≥ 0	ms	N/A	bucket_name	1 minute
request_get_size_between_10MB_100MB_latency	GET Request Latency (10 MB < Object ≤ 100 MB)	Average latency of GET requests against objects that are larger than 10 MB but no larger than 100 MB in a measurement period.	≥ 0	ms	N/A	bucket_name	1 minute
request_get_size_gt_100MB_latency	GET Request Latency (Object > 100 MB)	Average latency of GET requests against objects larger than 100 MB in a measurement period.	≥ 0	ms	N/A	bucket_name	1 minute
request_put_size_le_1MB_latency	PUT Request Latency (Object ≤ 1 MB)	Average latency of PUT requests against objects no larger than 1 MB in a measurement period.	≥ 0	ms	N/A	bucket_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
request_put_size_between_1MB_4MB_latency	PUT Request Latency (1 MB < Object ≤ 4 MB)	Average latency of PUT requests against objects that are larger than 1 MB but no larger than 4 MB in a measurement period.	≥ 0	ms	N/A	bucket_name	1 minute
request_put_size_between_4MB_10MB_latency	PUT Request Latency (4 MB < Object ≤ 10 MB)	Average latency of PUT requests against objects that are larger than 4 MB but no larger than 10 MB in a measurement period.	≥ 0	ms	N/A	bucket_name	1 minute
request_put_size_between_10MB_100MB_latency	PUT Request Latency (10 MB < Object ≤ 100 MB)	Average latency of PUT requests against objects that are larger than 10 MB but no larger than 100 MB in a measurement period.	≥ 0	ms	N/A	bucket_name	1 minute
request_put_size_gt_100MB_latency	PUT Request Latency (Object > 100 MB)	Average latency of PUT requests against objects larger than 100 MB in a measurement period.	≥ 0	ms	N/A	bucket_name	1 minute
upload_server_request_latency	Total Server-Side Upload Latency	Average time required for uploading objects on the OBS server.	≥ 0	ms	N/A	bucket_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
upload_total_request_latency	Total E2E Upload Latency	Average end-to-end time required for uploading objects.	≥ 0	ms	N/A	bucket_name	1 minute
download_server_request_latency	Total Server-Side Download Latency	Average time required for downloading objects on the OBS server.	≥ 0	ms	N/A	bucket_name	1 minute
download_total_request_latency	Total E2E Download Latency	Average end-to-end time required for downloading objects.	≥ 0	ms	N/A	bucket_name	1 minute
request_size_le_1MB_latency_p99	P99 Request Latency (Object ≤ 1 MB)	P99 latency of the requests for objects no larger than 1 MB.	≥ 0	ms	N/A	bucket_name	1 minute
request_size_between_1MB_4MB_latency_p99	P99 Request Latency (1 MB < Object ≤ 4 MB)	P99 latency of the requests for objects from 1 MB (exclusive) to 4 MB.	≥ 0	ms	N/A	bucket_name	1 minute
request_size_between_4MB_10MB_latency_p99	P99 Request Latency (4 MB < Object ≤ 10 MB)	P99 latency of the requests for objects from 4 MB (exclusive) to 10 MB.	≥ 0	ms	N/A	bucket_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
request_size_between_10MB_100MB_latency_p99	P99 Request Latency (10 MB < Object ≤ 100 MB)	P99 latency of the requests for objects from 10 MB (exclusive) to 100 MB.	≥ 0	ms	N/A	bucket_name	1 minute
request_size_gt_100MB_latency_p99	P99 Request Latency (Object > 100 MB)	P99 latency of the requests for objects larger than 100 MB.	≥ 0	ms	N/A	bucket_name	1 minute
request_size_le_1MB_latency_p95	P95 Request Latency (Object ≤ 1 MB)	P95 latency of the requests for objects no larger than 1 MB.	≥ 0	ms	N/A	bucket_name	1 minute
request_size_between_1MB_4MB_latency_p95	P95 Request Latency (1 MB < Object ≤ 4 MB)	P95 latency of the requests for objects from 1 MB (exclusive) to 4 MB.	≥ 0	ms	N/A	bucket_name	1 minute
request_size_between_4MB_10MB_latency_p95	P95 Request Latency (4 MB < Object ≤ 10 MB)	P95 latency of the requests for objects from 4 MB (exclusive) to 10 MB.	≥ 0	ms	N/A	bucket_name	1 minute
request_size_between_10MB_100MB_latency_p95	P95 Request Latency (10 MB < Object ≤ 100 MB)	P95 latency of the requests for objects from 10 MB (exclusive) to 100 MB.	≥ 0	ms	N/A	bucket_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
request_size_gt_100MB_latency_p95	P95 Request Latency (Object > 100 MB)	P95 latency of the requests for objects larger than 100 MB.	≥ 0	ms	N/A	bucket_name	1 minute
request_size_le_1MB_latency_p90	P90 Request Latency (Object ≤ 1 MB)	P90 latency of the requests for objects no larger than 1 MB.	≥ 0	ms	N/A	bucket_name	1 minute
request_size_between_1MB_4MB_latency_p90	P90 Request Latency (1 MB < Object ≤ 4 MB)	P90 latency of the requests for objects from 1 MB (exclusive) to 4 MB.	≥ 0	ms	N/A	bucket_name	1 minute
request_size_between_4MB_10MB_latency_p90	P90 Request Latency (4 MB < Object ≤ 10 MB)	P90 latency of the requests for objects from 4 MB (exclusive) to 10 MB.	≥ 0	ms	N/A	bucket_name	1 minute
request_size_between_10MB_100MB_latency_p90	P90 Request Latency (10 MB < Object ≤ 100 MB)	P90 latency of the requests for objects from 10 MB (exclusive) to 100 MB.	≥ 0	ms	N/A	bucket_name	1 minute
request_size_gt_100MB_latency_p90	P90 Request Latency (Object > 100 MB)	P90 latency of the requests for objects larger than 100 MB.	≥ 0	ms	N/A	bucket_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
request_count_monitor_6XX	6XX Status Codes	Number of requests whose status code returned by the server is 6*xx*.	≥ 0	Count	N/A	tenant_id bucket_name bucket_name, domain_name	1 minute
request_count_monitor_7XX	7XX Status Codes	Number of requests whose status code returned by the server is 7*xx*.	≥ 0	Count	N/A	tenant_id bucket_name bucket_name, domain_name	1 minute
get_mirror_range_bandwidths	Range Retrieval Bandwidth (Mirroring-based Back to Source)	Bandwidth for retrieving object ranges with mirroring-based back to source	≥ 0	Byte/s	1024 (IEC)	tenant_id	1 minute
get_mirror_fetch_bandwidths	Fetch Bandwidth (Mirroring-based Back to Source)	Bandwidth for fetches triggered by mirroring-based back to source	≥ 0	Byte/s	1024 (IEC)	tenant_id	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
get_mirror_fetch_task_status	Fetch Status (Mirroring-based Back to Source)	Status of asynchronous fetches triggered by mirroring-based back to source. A value of 1 indicates that asynchronous fetches can be triggered, while a value less than 1 indicates that asynchronous fetches cannot be triggered.	≤ 1	Count	N/A	tenant_id	1 minute
standard_request_upload_bandwidths	Avg. Bandwidth for Uploading Standard Objects	Average size of all Standard objects uploaded using PUT and POST per second in a measurement period	≥ 0	Byte/s	1024 (IEC)	bucket_name	1 minute
infrequent_request_upload_bandwidths	Avg. Bandwidth for Uploading Infrequent Access Objects	Average size of all Infrequent Access objects uploaded using PUT and POST per second in a measurement period	≥ 0	Byte/s	1024 (IEC)	bucket_name	1 minute
archive_request_upload_bandwidths	Avg. Bandwidth for Uploading Archive Objects	Average size of all Archive objects uploaded using PUT and POST per second in a measurement period	≥ 0	Byte/s	1024 (IEC)	bucket_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
standard_request_delete_bytes	Avg. Bandwidth for Deleting Standard Objects	Average size of all Standard objects deleted using DELETE per second in a measurement period	≥ 0	Byte/s	1024 (IEC)	bucket_name	1 minute
infrequent_request_delete_bytes	Avg. Bandwidth for Deleting Infrequent Access Objects	Average size of all Infrequent Access objects deleted using DELETE per second in a measurement period	≥ 0	Byte/s	1024 (IEC)	bucket_name	1 minute
archive_request_delete_bytes	Avg. Bandwidth for Deleting Archive Objects	Average size of all Archive objects deleted using DELETE per second in a measurement period	≥ 0	Byte/s	1024 (IEC)	bucket_name	1 minute
standard_request_download_bandwidths	Avg. Bandwidth for Downloading Standard Objects	Average size of all Standard objects downloaded using GET per second in a measurement period	≥ 0	Byte/s	1024 (IEC)	bucket_name	1 minute
infrequent_request_download_bandwidths	Avg. Bandwidth for Downloading Infrequent Access Objects	Average size of all Infrequent Access objects downloaded using GET per second in a measurement period	≥ 0	Byte/s	1024 (IEC)	bucket_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
archive_request_download_bandwidths	Avg. Bandwidth for Downloading Archive Objects	Average size of all Archive objects downloaded using GET per second in a measurement period	≥ 0	Byte/s	1024 (IEC)	bucket_name	1 minute
standard_download_request_count	Standard Object Download Requests	Average number of GET requests for Standard objects per second in a measurement period	≥ 0	Count	N/A	bucket_name	1 minute
infrequent_download_request_count	Infrequent Access Object Download Requests	Average number of GET requests for Infrequent Access objects per second in a measurement period	≥ 0	Count	N/A	bucket_name	1 minute
archive_download_request_count	Archive Object Download Requests	Average number of GET requests for Archive objects per second in a measurement period	≥ 0	Count	N/A	bucket_name	1 minute
standard_upload_request_count	Standard Object Upload Requests	Average number of PUT and POST requests for Standard objects per second in a measurement period	≥ 0	Count	N/A	bucket_name	1 minute

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
infrequent_upload_request_count	Infrequent Access Object Upload Requests	Average number of PUT and POST requests for Infrequent Access objects per second in a measurement period	≥ 0	Count	N/A	bucket_name	1 minute
archive_upload_request_count	Archive Object Upload Requests	Average number of PUT and POST requests for Archive objects per second in a measurement period	≥ 0	Count	N/A	bucket_name	1 minute

Table 10-2 OBS metrics (for storage)

Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
capacity_total	Total Used Storage Space	Measures the storage space occupied by all data.	≥ 0	Bytes	1024 (IEC)	tenant_id bucket_name	30 minutes
capacity_standard	Used Space - Standard Storage	Measures the storage space occupied by Standard data.	≥ 0	Bytes	1024 (IEC)	tenant_id bucket_name	30 minutes

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
capacity_infrequent_access	Used Space - Infrequent Access Storage	Measures the storage space occupied by Infrequent Access data.	≥ 0	Bytes	1024 (IEC)	tenant_id bucket_name	30 minutes
capacity_archive	Used Space - Archive Storage	Measures the storage space occupied by Archive data.	≥ 0	Bytes	1024 (IEC)	tenant_id bucket_name	30 minutes
capacity_deep_archive	Used Space - Deep Archive Storage	Measures the storage space occupied by Deep Archive data.	≥ 0	Byte	1024 (IEC)	tenant_id bucket_name	30 minutes
capacity_standard_single_az	Standard Storage (Single-AZ)	Space occupied by Standard data stored in a single AZ	≥ 0	Byte	1024 (IEC)	tenant_id bucket_name	30 minutes
capacity_standard_multi_az	Standard Storage (Multi-AZ)	Space occupied by Standard data stored in multiple AZs	≥ 0	Byte	1024 (IEC)	tenant_id bucket_name	30 minutes
capacity_infrequent_access_single_az	Infrequent Access Storage (Single-AZ)	Space occupied by Infrequent Access data stored in a single AZ	≥ 0	Byte	1024 (IEC)	tenant_id bucket_name	30 minutes
capacity_infrequent_access_multi_az	Infrequent Access Storage (Multi-AZ)	Space occupied by Infrequent Access data stored in multiple AZs	≥ 0	Byte	1024 (IEC)	tenant_id bucket_name	30 minutes

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
object_num_all	Total Number of Objects	Total number of objects (including folders and all file versions) stored in all storage classes	≥ 0	Count	N/A	tenant_id bucket_name	30 minutes
object_num_standard_total	Number of Objects - Standard Storage	Total number of objects (including folders and all file versions) stored in the Standard storage class	≥ 0	Count	N/A	tenant_id bucket_name	30 minutes
object_num_infrequent_access_total	Number of Objects - Infrequent Access Storage	Total number of objects (including folders and all file versions) stored in the Infrequent Access storage class	≥ 0	Count	N/A	tenant_id bucket_name	30 minutes
object_num_archive_total	Number of Objects - Archive Storage	Total number of objects (including folders and all file versions) stored in the Archive storage class	≥ 0	Count	N/A	tenant_id bucket_name	30 minutes
object_num_deep_archive_total	Number of Objects - Deep Archive Storage	Total number of objects (including folders and all file versions) stored in the Deep Archive storage classes	≥ 0	Count	N/A	tenant_id bucket_name	30 minutes
object_num_standard_single_az	Standard Objects (Single-AZ)	Total number of Standard objects (including folders and all object versions) stored in a single AZ	≥ 0	Count	N/A	tenant_id bucket_name	30 minutes

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Metric ID	Metric	Description	Value Range	Unit	Conversion Rule	Dimension	Monitoring Period (Original Metric)
object_num_standard_multi_az	Standard Objects (Multi-AZ)	Total number of Standard objects (including folders and all object versions) stored in multiple AZs	≥ 0	Count	N/A	tenant_id bucket_name	30 minutes
object_num_infrequent_access_single_az	Infrequent Access Objects (Single-AZ)	Total number of Infrequent Access objects (including folders and all object versions) stored in a single AZ	≥ 0	Count	N/A	tenant_id bucket_name	30 minutes
object_num_infrequent_access_multi_az	Infrequent Access Objects (Multi-AZ)	Total number of Infrequent Access objects (including folders and all object versions) stored in multiple AZs	≥ 0	Count	N/A	tenant_id bucket_name	30 minutes

If a monitored object has multiple dimensions, the dimensional level of specific metrics is required when you use APIs to query the metrics.

For example, to collect statistics on the number of requests (request_code_count) with status code 400 for accessing bucket **test-bucket**, the dimension of the metric is **bucket_name,http_code**, where **bucket_name** indicates level 0 and **http_code** indicates level 1.

- To query a single metric by calling an API, the **http_code** dimension is used as follows:
  ```
  dim.0=bucket_name,test-bucket&dim.1=http_code,400
  ```
  test-bucket and **400** are dimension values of **bucket_name** and **http_code**, respectively. For details about how to obtain the values, see **Dimensions**.
- To query multiple metrics by calling an API, the **http_code** dimension is used as follows:
  ```
  "dimensions": [
              {
                 "name": "bucket_name",
                 "value": "test-bucket"
              },
              {
  ```

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```
            "name": "http_code",
            "value": "400"
        }
    ]
```

test-bucket and **400** are dimension values of **bucket_name** and **http_code**, respectively. For details about how to obtain the values, see **Dimensions**.

Dimensions

Table 10-3 Dimensions

Key	Value
tenant_id	User dimension. The value is an account ID. To obtain the ID, see **Obtaining Account, IAM User, Project, User Group, Region, and Agency Information**.
bucket_name	Bucket dimension. The value is the bucket name. For details about the value, see **Listing Buckets**.
bucket_name,api_name	API dimension. For details about the value, see **Table 10-4**.
bucket_name,domain_name	Domain name dimension. The value is the domain name of the bucket to be accessed. For details about the value, see **Viewing Bucket Information**.
• tenant_id,http_code • bucket_name,http_code • bucket_name,api_name,http_code	HTTP return code dimension. For details about the values, see **Table 10-5**.

Request APIs

The following table lists the APIs supported by the **bucket_name,api_name** dimension in **Table 10-3**.

Table 10-4 Request APIs

ID	Name
LIST.BUCKETS	Listing Buckets
PUT.BUCKET	Creating a Bucket
LIST.BUCKET.OBJECTS	Listing Objects in a Bucket

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ID	Name
LIST.BUCKET.OBJECTVERSIONS	Listing Objects in a Bucket (Versioning)
HEAD.BUCKET	Obtaining Bucket Metadata
GET.BUCKET.LOCATION	Obtaining Bucket Location
LIST.BUCKET.UPLOADS	Listing Multipart Uploads
POST.OBJECT.MULTIDELETE	Batch Deleting Objects
POST.OBJECT	Uploading Objects - POST
PUT.PART	Uploading Parts
PUT.PART.COPY	Copying Parts
DELETE.UPLOAD	Canceling a Part
LIST.OBJECT.UPLOAD	Listing Uploaded Parts of an Object
POST.UPLOAD.COMPLETE	Completing a Multipart Upload
POST.UPLOAD.INIT	Initiating a Multipart Upload
PUT.OBJECT	Uploading Objects
APPEND.OBJECT	Appending an Object
PUT.OBJECT.COPY	Copying an Object
DELETE.OBJECT	Deleting an Object
GET.OBJECT	Downloading an Object
HEAD.OBJECT	Heading objects
POST.OBJECT.RESTORE	Restoring an Object
PUT.OBJECT.METADATA	Modifying Object Metadata

HTTP Status Codes

The following table lists the HTTP status codes supported by the **tenant_id,http_code**, **bucket_name,api_name,http_code**, and **bucket_name,http_code** dimensions in **Table 10-3**.

Table 10-5 HTTP status codes

HTTP Status Code	Description
400	Incorrect request packet format.
401	Failed to authenticate and authorize.

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HTTP Status Code	Description
403	Insufficient permission, access denied, limited MimeType, file type not allowed, or others
404	The requested resource does not exist.
405	The specified method is not allowed against the requested resource.
406	CRC32 check failed for the uploaded data.
413	Incorrect size of the uploaded object.
499	The traffic on the client is interrupted or data transmission on the client times out.
500	Internal error. Please try again later.
579	The object is successfully uploaded, but the callback fails.
599	The server fails to operate.
612	The specified resource does not exist or has been deleted.
614	The target resources already exist.
650	Access of monitoring callbacks to the origin server times out or fails.
701	The block expires, the segments are discontinuous, the total block size does not match the object size, or others.

10.1.3 Monitored OBS Events

Functions

You can configure alarm rules on Cloud Eye to monitor critical events or operation events related to your cloud resources. Once configured, Cloud Eye will notify you when the specified events happen.

Namespace

SYS.OBS

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Monitored Events

Table 10-6 OBS events that can be monitored

Event Name	Event ID	Severity	Description	Handling Suggestion	Impact
Delete bucket	deleteBucket	Major	An event is reported when a bucket deletion takes place.	Deleted buckets cannot be recovered. If you still need to use buckets, **create a bucket** again. **CAUTION** If you want to reuse the name of a deleted bucket for a new bucket, wait at least 30 minutes after the bucket is deleted.	Deleting buckets may affect your services. Before deleting a bucket, make sure that your services do not depend on it.
Delete bucket policy	deleteBucketPolicy	Major	An event is reported when a bucket policy deletion takes place.	• You can delete unwanted bucket policies. • If you delete a bucket policy by mistake, **create the bucket policy** again.	After a bucket policy is deleted, some users may fail to access the associated bucket and the objects in it.
Set bucket ACL	setBucketAcl	Minor	An event is reported when a bucket ACL configuration takes place.	If you do not want an account to access a bucket or the objects in it, you can delete the bucket ACL.	A bucket ACL grants an account the access to the bucket and the objects in it.
Set bucket policy	setBucketPolicy	Minor	An event is reported when a bucket policy configuration takes place.	If you do not need a bucket policy to perform fine-grained access control over a bucket and the objects in it, you can delete the bucket policy.	A bucket policy grants an account some operation permissions for the bucket or the objects in it under certain conditions.

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10.2 Using CTS to Audit OBS

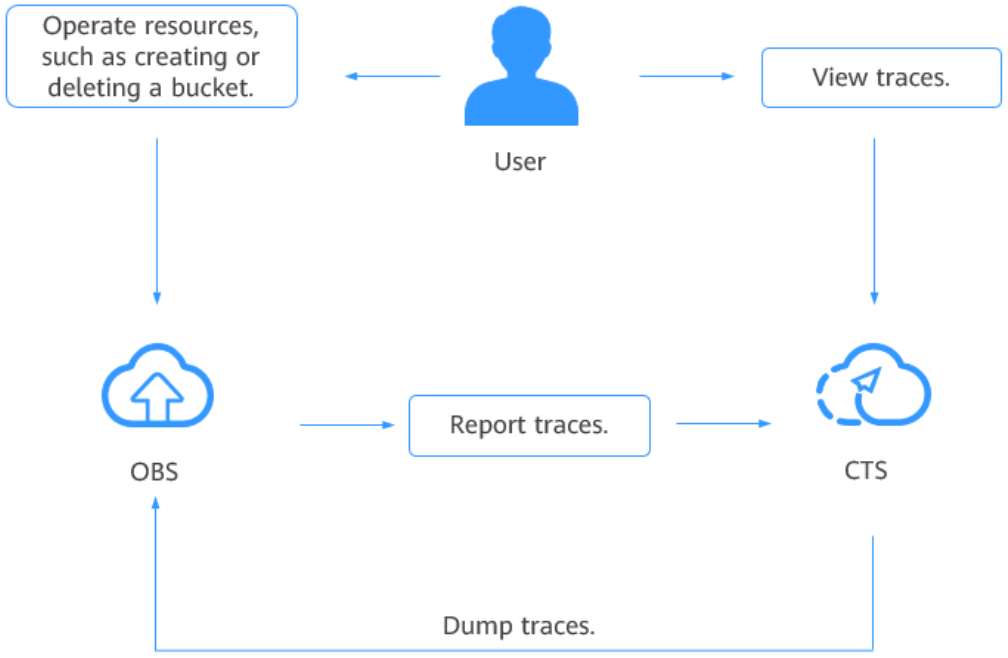
Cloud Trace Service (CTS) records operations on cloud resources in your account. You can use the logs to perform security analysis, track resource changes, audit compliance, and locate faults.

After you enable CTS and configure a tracker, CTS can record management and data traces of OBS for auditing.

For details about how to enable and configure CTS, see **Getting Started**.

For details about OBS management and data traces that can be tracked by CTS, see **Cloud Trace Service**.

Figure 10-2 CTS



Procedure

Step 1 Log in to the **Cloud Eye console**.

Step 2 Configure the cloud audit for OBS by referring to **Configuring a Tracker** in the *Cloud Trace Service User Guide*.

----End

Table 10-7 OBS management operations logged by CTS

Tracker Type	Operation	Resource	Trace Name
Management	Creating a bucket	Bucket	createBucket

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Tracker Type	Operation	Resource	Trace Name
Management	Deleting a bucket	Bucket	deleteBucket
Management	Listing buckets	Bucket	listAllMyBuckets (If you use OBS Console to list buckets, relevant traces will be recorded in CN-Hong Kong or AP-Singapore. For Latin America, traces of listing buckets are recorded as follows: those in LA-Santiago are recorded in LA-Santiago, those in LA-Sao Paulo1, LA-Buenos Aires1, and LA-Lima1 are recorded in LA-Sao Paulo1, and those in LA-Mexico City1 and LA-Mexico City2 are recorded in LA-Mexico City2.)
Management	Obtaining bucket metadata	Bucket	headBucket
Management	Obtaining the bucket location	Bucket	getBucketLocation
Management	Listing objects in a bucket	Bucket	listObjects
Management	Listing initiated multipart uploads in a bucket	Bucket	listMultipartUploads
Management	Obtaining the storage usage of a bucket	Bucket	getBucketStorageInfo
Management	Configuring a CORS Rule for a Bucket	Bucket	setBucketCors
Management	Obtaining the CORS configuration of a bucket	Bucket	getBucketCors
Management	Deleting the CORS configuration of a bucket	Bucket	deleteBucketCors

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Tracker Type	Operation	Resource	Trace Name
Management	Configuring a user-defined domain name for a bucket	Bucket	setBucketCustomdomain
Management	Obtaining the user-defined domain name of a bucket	Bucket	getBucketCustomdomain
Management	Deleting the user-defined domain name of a bucket	Bucket	deleteBucketCustomdomain
Management	Configuring the bucket lifecycle rules	Bucket	setBucketLifecycle
Management	Obtaining the lifecycle configuration of a bucket	Bucket	getBucketLifecycle
Management	Deleting the lifecycle configuration of a bucket	Bucket	deleteBucketLifecycle
Management	Configuring the cross-region replication function for buckets	Bucket	setBucketReplication
Management	Obtaining the cross-region replication configuration of a bucket	Bucket	getBucketReplication
Management	Deleting the cross-region replication configuration of a bucket	Bucket	deleteBucketReplication
Management	Configuring the bucket tag	Bucket	setBucketTagging
Management	Obtaining the tags of a bucket	Bucket	getBucketTagging
Management	Deleting the tag configuration of a bucket	Bucket	deleteBucketTagging

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Tracker Type	Operation	Resource	Trace Name
Management	Configuring static website hosting for a bucket	Bucket	setBucketWebsite
Management	Obtaining the static website hosting configuration of a bucket	Bucket	getBucketWebsite
Management	Deleting the static website hosting configuration of a bucket	Bucket	deleteBucketWebsite
Management	Configuring a bucket policy	Bucket	setBucketPolicy
Management	Deleting a bucket policy	Bucket	deleteBucketPolicy
Management	Configuring a bucket ACL	Bucket	setBucketAcl
Management	Obtaining a bucket ACL	Bucket	getBucketAcl
Management	Configuring logging for a bucket	Bucket	setBucketLogging
Management	Obtaining the logging configuration of a bucket	Bucket	getBucketLogging
Management	Configuring event notifications for a bucket	Bucket	setBucketNotification
Management	Obtaining the event notification configuration of a bucket	Bucket	getBucketNotification
Management	Configuring a storage quota for a bucket	Bucket	setBucketQuota
Management	Obtaining the storage quota of a bucket	Bucket	getBucketQuota

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Tracker Type	Operation	Resource	Trace Name
Management	Configuring the storage class for a bucket	Bucket	setBucketStorageclass
Management	Obtaining the storage class of a bucket	Bucket	getBucketStorageclass
Management	Configuring versioning for a bucket	Bucket	setBucketVersioning
Management	Obtaining the versioning status of a bucket	Bucket	getBucketVersioning
Management	Configuring server-side encryption for a bucket	Bucket	setBucketEncryption
Management	Obtaining the server-side encryption configuration of a bucket	Bucket	getBucketEncryption
Management	Deleting the server-side encryption configuration of a bucket	Bucket	deleteBucketEncryption
Management	Obtaining the Block Public Access configuration of a bucket	Bucket	getBucketPublicAccess-Block
Management	Configuring Block Public Access for a bucket	Bucket	putBucketPublicAccess-Block
Management	Deleting the Block Public Access configuration of a bucket	Bucket	deleteBucketPublicAc-cessBlock
Management	Obtaining the public access status of a bucket policy	Bucket	getBucketPolicyPublic-Status
Management	Obtaining the public access status of a bucket	Bucket	getBucketPublicStatus

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Tracker Type	Operation	Resource	Trace Name
Management	Configuring an inventory for a bucket	Bucket	setBucketInventory-Configuration
Management	Obtaining the inventory configuration of a bucket	Bucket	getBucketInventory-Configuration
Management	Deleting the inventory configuration of a bucket	Bucket	deleteBucketInventory-Configuration
Management	Configuring direct reading for objects in a bucket	Bucket	setBucketDirectColdAccess
Management	Obtaining the Direct Reading policy of a bucket	Bucket	getBucketDirectColdAccess
Management	Deleting the Direct Reading policy of a bucket	Bucket	deleteBucketDirectColdAccess
Management	Configuring a back-to-source by mirroring rule	Bucket	setBucketBackToSource
Management	Obtaining a back-to-source by mirroring rule	Bucket	getBucketBackToSource
Management	Deleting a back-to-source by mirroring rule	Bucket	deleteBucketBackToSource
Management	Configuring a default WORM policy for a bucket	Bucket	setBucketObjectLock-Configuration
Management	Obtaining the default WORM policy of a bucket	Bucket	getBucketObjectLock-Configuration
Management	Sending an OPTIONS request to a bucket	Bucket	optionsBucket
Management	Configuring a bucket trigger	Bucket	putTriggerPolicy

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Tracker Type	Operation	Resource	Trace Name
Management	Deleting a bucket trigger	Bucket	deleteTriggerPolicy
Management	Creating a workflow template	Bucket	createWorkflowTemplate
Management	Deleting a workflow template	Bucket	deleteWorkflowTemplate
Management	Creating a workflow	Bucket	createWorkflow
Management	Deleting a workflow	Bucket	deleteWorkflow
Management	Updating a workflow	Bucket	updateWorkflow
Management	Creating a workflow	Bucket	directCreateWorkflow
Management	Enabling workflow authorization	Bucket	openWorkflowAuthorization
Management	Resuming a failed workflow instance	Bucket	restoreFailedWorkflowExecution
Management	Triggering a workflow using an API	Bucket	asyncAPIStartWorkflow
Management	Creating a public action template	Bucket	createMyActionTemplate
Management	Modifying a submitted public action template	Bucket	updateMyActionTemplate
Management	Deleting a submitted public action template	Bucket	deleteMyActionTemplate
Management	Disabling a submitted public action template	Bucket	forbidMyActionTemplate
Management	Agreeing to the service agreement	Bucket	openWorkflowAgreements

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Table 10-8 OBS data operations logged by CTS

Tracker Type	Operation	Resource	Trace Name
Data_Read	Downloading an object	Object	GET.OBJECT
Data_Read	Querying the object ACL	Object	GET.OBJECT.ACL
Data_Read	Querying the bucket website configuration	Object	GET.OBJECT.WEBSITE
Data_Read	Accessing an object through the website	Object	HEAD.OBJECT.WEBSITE
Data_Read	Querying the object metadata	Object	HEAD.OBJECT
Data_Read	Listing part data	Object	LIST.OBJECT.UPLOAD
Data_Write	Deleting an object	Object	DELETE.OBJECT
Data_Write	Canceling a part	Object	DELETE.UPLOAD
Data_Write	Queries the cross-domain requests for objects	Object	OPTIONS.OBJECT
Data_Write	Uploading an object	Object	POST.OBJECT
Data_Write	Deleting objects in batches	Object	POST.OBJECT.MULTIDELETE
Data_Write	Restoring Archive objects	Object	POST.OBJECT.RESTORE
Data_Write	Merging parts	Object	POST.UPLOAD.COMPLETE
Data_Write	Initializing multipart tasks	Object	POST.UPLOAD.INIT
Data_Write	Uploading an object	Object	PUT.OBJECT
Data_Write	Configuring the object ACL	Object	PUT.OBJECT.ACL
Data_Write	Copying an object	Object	PUT.OBJECT.COPY
Data_Write	Configuring the object storage class	Object	PUT.OBJECT.STORAGECLASS

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Tracker Type	Operation	Resource	Trace Name
Data_Write	Uploading a part	Object	PUT.PART
Data_Write	Copying a part	Object	PUT.PART.COPY

Follow-up Operations

You can click **Disable** under the **Operation** column on the right of a tracker to disable the tracker. After the tracker is disabled, the system will stop recording operations, but you can still view existing operation records.

You can click **Delete** under the **Operation** column on the right of a tracker to delete the tracker. Deleting a tracker has no impact on existing operation records. When you enable CTS again, you can view operation records that have been generated.

10.3 Using Logging to Record OBS Logs

10.3.1 Logging Overview

Scenarios

Bucket access generates a large number of logs, but OBS does not collect them by default. To analyze the characteristics, types, or trends of requests to a bucket, you can enable logging for the bucket. OBS will automatically create the log files according to certain naming rules and upload them to the specified log storage bucket (the current bucket or another bucket in the same region).

Constraints

You can store logs in the logged bucket or another bucket. However, the log storage bucket and logged bucket must belong to the same account and region.

Important Notes

After logging is configured for a bucket, its operation logs will appear in the log storage bucket in about fifteen minutes. Log files for a given period may not contain all requests made during that period. Some requests may appear in the log files of the previous or next period.

Log File Naming Rules

Log files follow this format: *<Log file name prefix>YYYY-mm-DD-HH-MM-SS-<UniqueString>*

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Table 10-9 Fields in a log file name

Field	Description
<Log file name prefix>	The log file name prefix a user specified
YYYY-mm-DD-HH-MM-SS	The time (UTC) when a log file was created
<UniqueString>	The character string automatically generated by OBS, which uniquely identifies a log file

- If *<Log file name prefix>* ends with a slash (/), the bucket's log files are stored in the folder named *<Log file name prefix>* in the target bucket. Each log file is named *YYYY-mm-DD-HH-MM-SS-<UniqueString>*.

  Figure 10-3 Log folder name

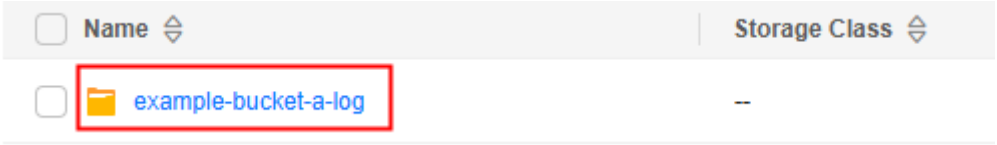
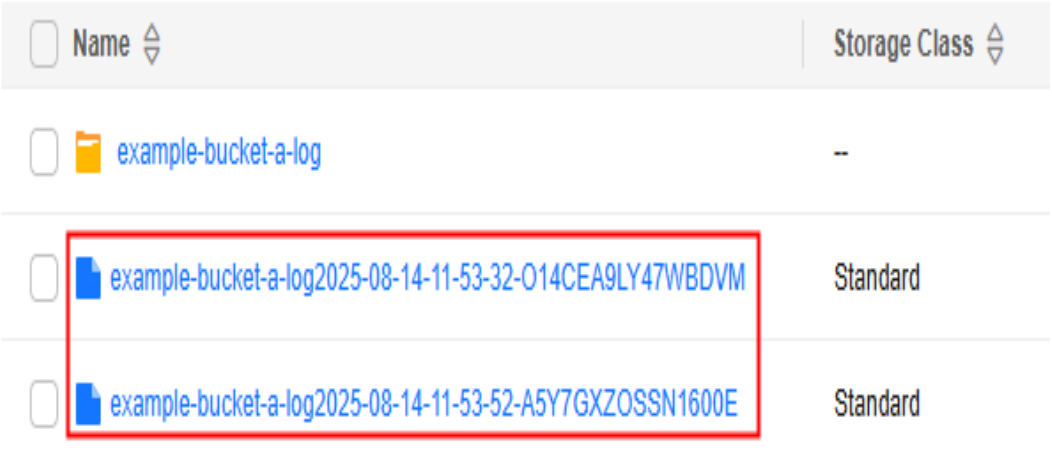
  

  Figure 10-4 Log file names

- If *<Log file name prefix>* does not end with a slash (/), the bucket's log files are stored in the root directory of the target bucket. Each log file is named *<Log file name prefix>YYYY-mm-DD-HH-MM-SS-<UniqueString>*.

  Figure 10-5 Log file names

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Log Fields

- **Example of log content**

  The following shows an example access log stored in the target bucket:

  ```
  787f2f92b20943998a4fe2ab75eb09b8 bucket [13/Aug/2015:01:43:42 +0000] xx.xx.xx.xx
  787f2f92b20943998a4fe2ab75eb09b8 281599BACAD9376ECE141B842B94535B
  REST.GET.BUCKET.LOCATION
  - "GET /bucket?location HTTP/1.1" 200 - 211 - 6 6 "-"  "HttpClient" - - - - "-"
  089fe8c2c380f4031f6dc0197fe99d4d HPTAAFZfyW0yD80idvjw
  ```

- **Log content format**

  The log content contains the entries listed in the following table.

  Table 10-10 Bucket log format

Parameter	Description	Example Value
BucketOwner	Account ID of the bucket owner	787f2f92b20943998a4fe2ab75eb09b8
BucketName	Bucket name	bucket
Time	UTC timestamp when OBS received the request	[13/Aug/2015:01:43:42 +0000]
Remote IP	IP address of the request source	192.168.7.132
Requester	Requester ID. The value can be: • **Anonymous**: indicating that the request was made by an anonymous user • *Account ID of the requester*: indicating that the request was made by an account or an IAM user	787f2f92b20943998a4fe2ab75eb09b8
RequestID	ID of the request for performing operations on the bucket	281599BACAD9376ECE141B842B94535B
Operation	Operation type of the request For common operations and their description, see **Table 10-11**.	REST.GET.BUCKET.LOCATION
Key	Name of the requested object	-
Request-URI	URI used in the request for operating OBS resources. For details about URIs, see **Constructing a Request**. **NOTE** If **query_string** is used for signature, the **Request-URI** will contain the signature information; otherwise, it will not.	GET /bucket?location HTTP/1.1

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Parameter	Description	Example Value
HTTPStatus	HTTP **status code** returned by OBS	200
ErrorCode	**Error code** returned by OBS. **-** indicates that no error code was returned.	-
BytesSent	Size of the HTTP response body Unit: byte **-** indicates that the HTTP response does not contain a body.	211
ObjectSize	Object size Unit: byte • When OBS deletes an object, it does not log the object's size. In the object deletion log, the value of **ObjectSize** is **0**. • If error code 4*XX* is returned, the value of **ObjectSize** is **-**, indicating that the specific object size is not displayed.	-
TotalTime	Total request duration Total request duration = Time when the last byte of the response was received – Time when the first byte of the request was sent	6
Turn-AroundTime	Time required by the OBS server to process the request, in ms Time required by the OBS server to process the request = Time when the first byte of the response was sent– Time when the last byte of the request was received	6
Referer	Referer header of the request The Referrer header is part of the HTTP request header. It indicates the URL from which the user navigated, helping the server identify the source of the request.	-

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Parameter	Description	Example Value
User-Agent	User-Agent header of the request The User-Agent header is part of the HTTP request header and identifies the client software that made the request. This header includes information about the browser, operating system, and device type. Servers can use that information to optimize response content or perform statistical analysis.	HttpClient
VersionID	Object version ID in the request. This parameter specifies the version of the object on which the operation is performed. In a bucket with versioning enabled, an object can have multiple versions. Each version has a unique version ID. For details, see **Versioning**.	-
STSLogUrn	Information about **federated identity authentication** and **agency authorization**	-
StorageClass	Current **storage class of the object**. The value can be: • **STANDARD**: the Standard storage class • **STANDARD_IA** (also **WARM**): the Infrequent Access storage class • **COLD**: the Archive storage class • **DEEP_ARCHIVE**: the Deep Archive storage class	STANDARD_IA

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Parameter	Description	Example Value
TargetStorageClass	**Storage class of the object** after the transition triggered by the lifecycle rule. The value can be: • **STANDARD**: the Standard storage class • **WARM**: the Infrequent Access storage class • **COLD**: the Archive storage class • **DEEP_ARCHIVE**: the Deep Archive storage class	GLACIER
DentryName	• For a parallel file system, this field indicates an internal identifier of a file or directory. Its value consists of a parent directory inode number and a file or directory name. • For a bucket, the value of this field is **-**.	12456/file.txt
IAMUserID	IAM user ID. The value can be: • *IAM user ID*: indicating that the request was made by a non-anonymous user • **Anonymous**: indicating that the request was made by an anonymous user	8f3b8c53d29244a780084f2b8c106c32
AccessKeyID	Access key ID of the requester. The value can be: • **-**: indicating that the request was made by an anonymous user • *Access key ID of the requester*: indicating that the request was made by a non-anonymous user	UDSIAMSTUBTEST002852

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Table 10-11 Common operations

Operation	Description	Operation	Description
REST.GET.SERVICE	Lists buckets.	REST.GET.ENCRYPTION	Obtains the bucket encryption configuration.
REST.PUT.BUCKET	Creates a bucket.	REST.DELETE.ENCRYPTION	Deletes the bucket encryption configuration.
REST.HEAD.BUCKET	Views the bucket information.	REST.PUT.OTM_DIRECT_COLD_ACCESS	Configures direct reading for Archive objects in a bucket.
REST.GET.BUCKETVERSIONS	Lists objects in a bucket.	REST.GET.OTM_DIRECT_COLD_ACCESS	Obtains the direct reading configuration of a bucket.
REST.GET.BUCKET	Obtains the bucket metadata.	REST.DELETE.OTM_DIRECT_COLD_ACCESS	Deletes the direct reading configuration of a bucket.
REST.GET.BUCKET.LOCATION	Obtains the bucket location.	REST.PUT.BUCKET.WEBSITE	Configures static website hosting for a bucket.
REST.DELETE.BUCKET	Deletes a bucket.	REST.GET.BUCKET.WEBSITE	Obtains the static website hosting configuration of a bucket.
REST.PUT.POLICY	Configures a bucket policy.	REST.DEL.BUCKET.WEBSITE	Deletes the static website hosting configuration of a bucket.
REST.GET.POLICY	Obtains a bucket policy.	REST.PUT.BUCKET.CORS	Configures CORS for a bucket.
REST.DELETE.POLICY	Deletes a bucket policy.	REST.GET.BUCKET.CORS	Obtains the CORS configuration of a bucket.
REST.PUT.ACL	Configures an ACL for a bucket or an object.	REST.DEL.BUCKET.CORS	Deletes the CORS configuration of a bucket.

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Operation	Description	Operation	Description
REST.GET.ACL	Obtains a bucket ACL or an object ACL.	REST.OPTIONS.BUCKET	Sends an OPTIONS request to a bucket.
REST.PUT.LOGGING_STATUS	Configures logging for a bucket.	REST.OPTIONS.OBJECT	Sends an OPTIONS request to an object.
REST.GET.LOGGING_STATUS	Obtains the logging configuration of a bucket.	REST.PUT.OBJECT	Uploads an object with PUT.
REST.PUT.BUCKET.LIFECYCLE	Configures a lifecycle rule for a bucket.	REST.POST.OBJECT	Uploads an object with POST.
REST.GET.LIFECYCLE	Obtains the lifecycle configuration of a bucket.	REST.COPY.OBJECT	Copies an object.
REST.DEL.LIFECYCLE	Deletes the lifecycle configuration of a bucket.	REST.GET.OBJECT	Obtains the object content.
REST.PUT.VERSIONING	Configures versioning for a bucket.	REST.HEAD.OBJECT	Obtains the object metadata.
REST.GET.VERSIONING	Obtains the versioning status of a bucket.	REST.DELETE.OBJECT	Deletes an object.
REST.GET.BUCKET.STORAGE.POLICY	Obtains the storage class of a bucket.	REST.TRANSITION.STORAGECLASS.OBJECT	Changes the storage class of an object.
REST.PUT.BUCKET.STORAGE.POLICY	Configures a storage class for a bucket.	OP_MULTIPLE_DELETEOBJECT	Batch deletes objects (the batch operation itself).
REST.PUT.REPLICATION	Configures cross-region replication for a bucket.	REST.POST.RESTORE	Restores an Archive object.

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Operation	Description	Operation	Description
REST.DELETE.REPLICATION	Deletes the cross-region replication configuration of a bucket.	REST.APPEND.OBJECT	Appends data to an object.
REST.GET.REPLICATION	Obtains the cross-region replication configuration of a bucket.	REST.MODIFY.OBJECT.META	Modifies the object metadata.
REST.PUT.TAGGING	Adds tags to a bucket.	REST.TRUNCATE.OBJECT	Truncates an object.
REST.GET.TAGGING	Obtains the tags of a bucket.	REST.RENAME.OBJECT	Renames an object.
REST.DEL.TAGGING	Deletes the tags of a bucket.	REST.GET.UPLOADS	Lists the initiated multipart uploads in a bucket.
REST.PUT.BUCKET_QUOTA	Configures a storage quota for a bucket.	REST.POST.UPLOADS	Initiates a multipart upload.
REST.GET.BUCKET.QUOTA	Obtains the storage quota of a bucket.	REST.PUT.PART	Uploads a part.
REST.GET.BUCKET.STORAGEINFO	Queries the storage usage of a bucket.	REST.COPY.PART	Copies a part.
REST.PUT.BUCKET.INVENTORY	Configures inventories for a bucket.	REST.GET.UPLOAD	Lists uploaded parts.
REST.GET.BUCKET.INVENTORY	Obtains or lists inventories of a bucket.	REST.POST.UPLOAD	Assembles parts.
REST.DELETE.BUCKET.INVENTORY	Deletes inventories of a bucket.	REST.DELETE.UPLOAD	Aborts a multipart upload.
REST.PUT.CUSTOMDOMAIN	Configures a user-defined domain name for a bucket.	REST.CLEAR.EXPIRE.UPLOAD	Deletes expired parts.

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Operation	Description	Operation	Description
REST.GET.CUSTOMDOMAIN	Obtains the user-defined domain name of a bucket.	REST.DELETE.CUSTOMDOMAIN	Deletes the user-defined domain name of a bucket.
REST.PUT.ENCRYPTION	Configures encryption for a bucket.	-	-

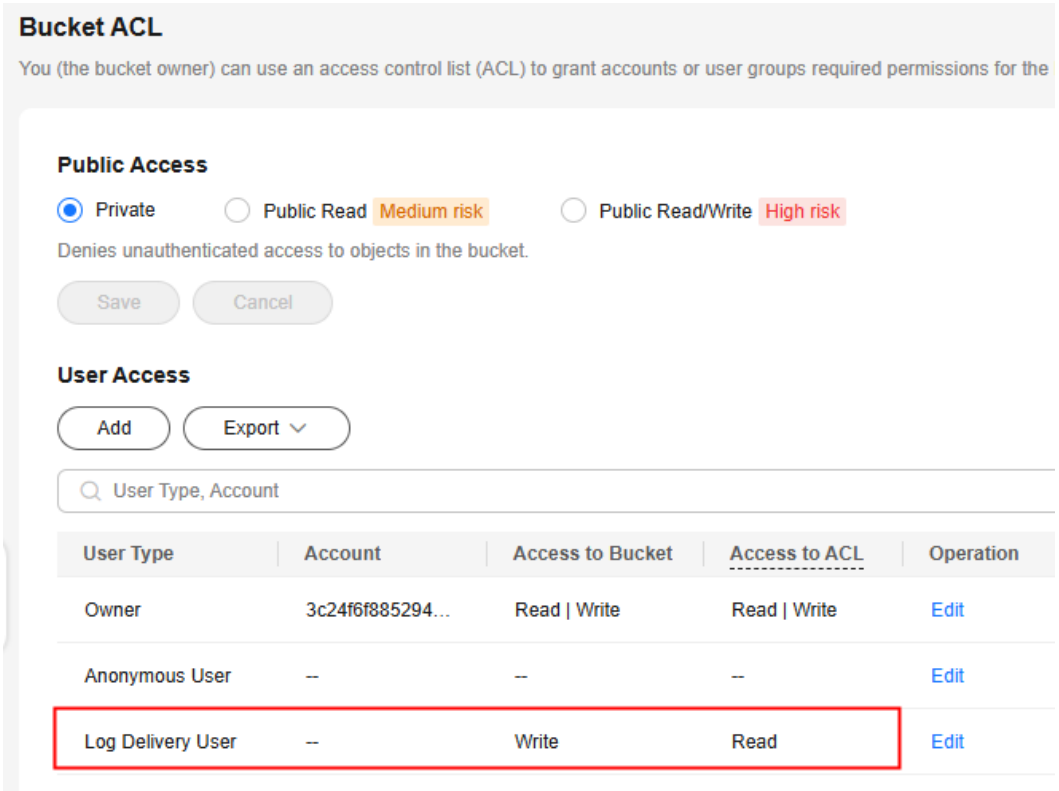
Billing for Bucket Logs

- Uploading and storing bucket logs will incur costs for PUT requests and storage. For details, see **OBS Billing**.
- If log files are stored in the logged bucket, OBS creates additional logs for writing log files to the bucket. The additional logs will take up extra storage. This leads to higher costs and makes it harder to locate required logs. Therefore, you are advised to store log files in a bucket other than the logged bucket.
- You can delete unnecessary log files to reduce storage costs. **Configuring lifecycle rules** for scheduled deletion is recommended.

Permissions Related to Bucket Logging

- **Enabling logging will automatically grant log delivery users the write and ACL read permissions for the log storage bucket.**

  If you manually disable such permissions, bucket logging will fail.



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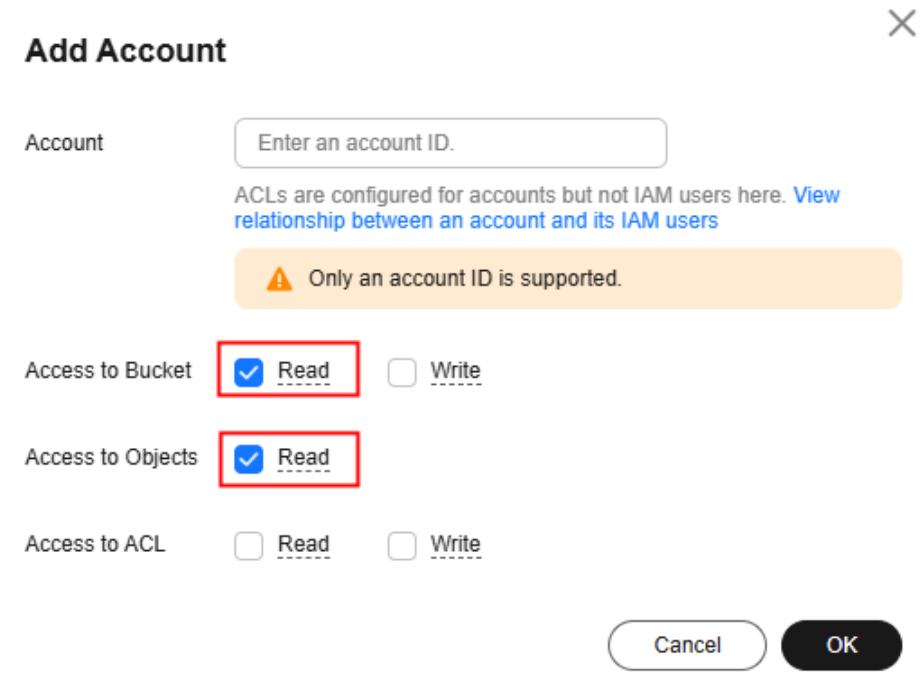
- OBS creates log files and uploads them to a specified bucket. To perform these operations, OBS must be granted required permissions. Therefore, before configuring logging for a bucket, you need to create an IAM agency for OBS and add this agency when configuring logging for the bucket. To create an agency, see **Creating an Agency for Uploading Logs**.
  - By default, you only need to grant the agency the upload permission (**obs:object:PutObject**) for the log storage bucket. The following is an example of a custom IAM policy in JSON. *mybucketlogs* indicates the name of the log storage bucket.

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "obs:object:PutObject"
            ],
            "Resource": [
                "OBS:*:*:object:mybucketlogs/*"
            ]
        }
    ]
}
```

- If the log storage bucket has Server-Side Encryption enabled, the agency also requires the **KMS Administrator** permission for the region where the bucket is located.
- **If you want other users to access log files stored in the log storage bucket, grant permissions to them in either of the following ways:**
  - Configuring the bucket ACL

    This method is applicable to accounts, but not to IAM users. To grant permissions to IAM users, **use bucket policies**.

    To access log files in a bucket, an account only requires the read permissions for the bucket and objects in it. For details, see **Configuring a Bucket ACL**.



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- Configuring a bucket policy
  - If you want other IAM users under your account (also the account of the log storage bucket owner) to read log files, **grant read permissions for specific objects to the IAM users**.
  - If you want IAM users under other accounts to read log files, **grant read permissions for specific objects to other accounts**.

10.3.2 Configuring Logging for a Bucket

When a bucket is accessed, OBS logs all the requests for the bucket. After logging is enabled for the bucket, OBS stores the logs either in the logged bucket or another bucket that belongs to the same account and region as the logged bucket. You can search and analyze these logs to trace and locate abnormal events. This section describes how to configure logging, verify the logging configuration, and disable logging for a bucket.

Configuring Logging for a Bucket

You can use **OBS Console**, APIs, or SDKs to configure logging for a bucket.

Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Overview**.

Step 4 In the **Basic Configurations** area, click **Logging**. The **Logging** dialog box is displayed.

Step 5 Select **Enable**. For details, see **Figure 10-6**.

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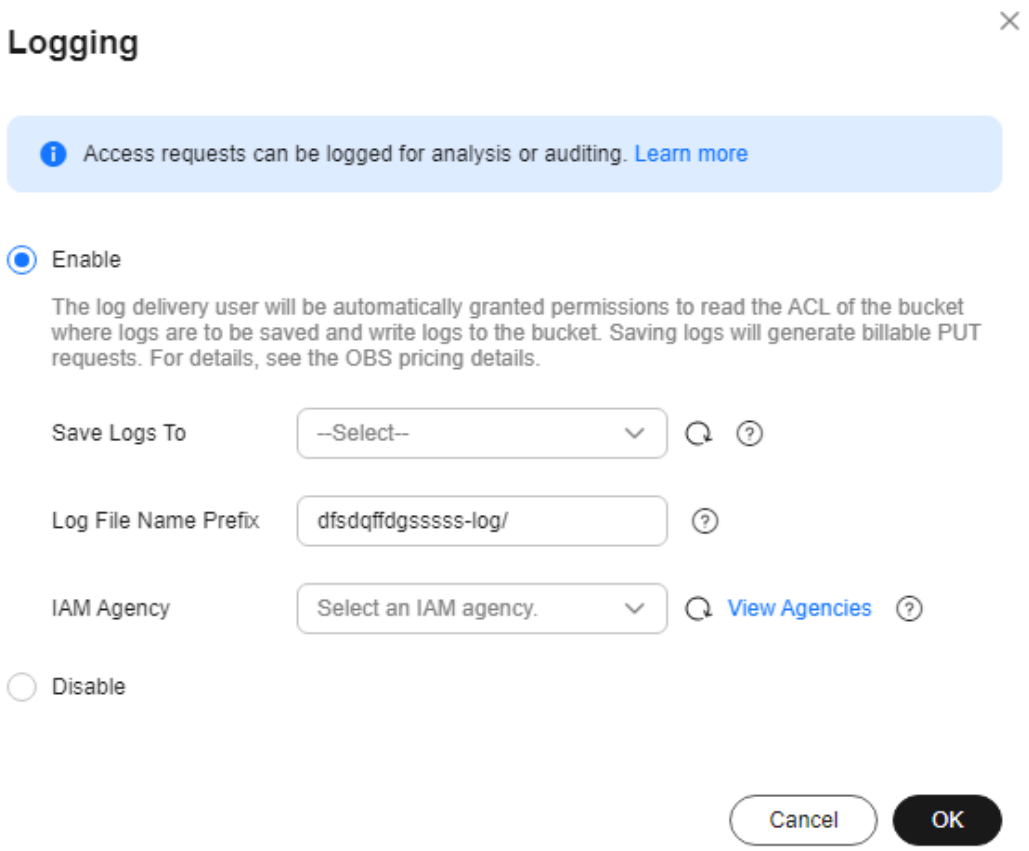
Figure 10-6 Logging



Step 6 Configure parameters.

Table 10-12 Parameters for configuring logging for the bucket

Parameter	Description
Save Logs To	Specifies the target bucket for storing log files of the source bucket. **You can select the source bucket or another bucket as the log storage bucket. If you choose another bucket, it must belong to the same account and region as the source bucket.** Once a log storage bucket is specified, OBS automatically grants log delivery users the write and ACL read permissions for that bucket.

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Parameter	Description
Log File Name Prefix	Specifies the prefix of the log file name. After logging is enabled, generated log files are named in the following format: *<Log File Name Prefix>YYYY-mm-DD-HH-MM-SS-<UniqueString>* • *<Log File Name Prefix>* is the prefix of the log file name, which is the parameter to be set here. – If *<Log file name prefix>* ends with a slash (/), the bucket's log files are stored in the folder named *<Log file name prefix>* in the target bucket. Each log file is named *YYYY-mm-DD-HH-MM-SS-<UniqueString>*, for example, **2025-06-03-07-18-11-WKK0T9O74VAWMHB7**. – If *<Log file name prefix>* does not end with a slash (/), the bucket's log files are stored in the root directory of the target bucket. Each log file is named *<Log file name prefix>YYYY-mm-DD-HH-MM-SS-<UniqueString>*, for example, **example-bucket-a-log2025-06-03-07-18-11-WKK0T9O74VAWMHB7**. • *YYYY-mm-DD-HH-MM-SS* indicates when the log file was generated. • *<UniqueString>* indicates a character string assigned by OBS.
IAM Agency	An agency is required to grant OBS permissions to upload log files to the log storage bucket. • By default, you only need to grant the agency the upload permission (**obs:object:PutObject**) for the log storage bucket. • If the log storage bucket has Server-Side Encryption enabled, the agency also requires the **KMS Administrator** permission for the region where the bucket is located. You can choose an existing IAM agency from the drop-down list or click **Create Agency** to create one. To create an agency, see **Creating an Agency for Uploading Logs**.

Step 7 Click **OK**.

After logging is configured for a bucket, its operation logs will appear in the log storage bucket in about fifteen minutes.

----End

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Using APIs

Configuring Logging for a Bucket

Using SDKs

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Verifying the Logging Configuration of a Bucket

After configuring logging for a bucket, you can use **OBS Console**, APIs, SDKs, or obsutil to verify the logging configuration. You can check whether OBS has generated log files and whether you have access to them.

Using OBS Console

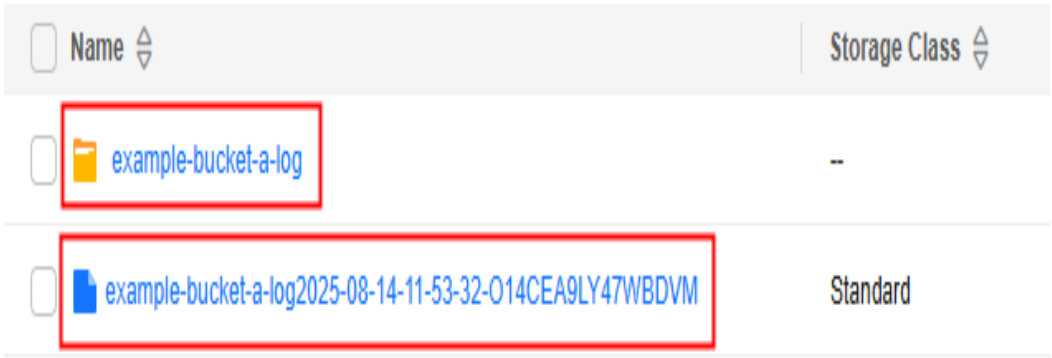
Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list of **OBS Console**, click the log storage bucket to go to the **Objects** page.

Step 3 Check whether log files exist.

Check whether log files exist or whether the folder for storing log files exists in the object list based on the configured log file name prefix and **log file naming rules**.

Figure 10-7 Checking the log folder or log files



Step 4 Check whether you can access the log files.

1. In the object list or in the log folder, click the name of a log file. The **Basic Information** page is displayed.
2. Click next to the link to copy the link of the log file.
3. Open this link in a browser.
   - If the log file can be downloaded, the account can access log files.
   - If the log file cannot be downloaded, the account does not have the permission to access log files. In this case, **grant read permissions for**

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specific objects to an IAM user or **grant read permissions for specific objects to other accounts**.

----End

Using APIs

1. **Check whether log files exist.**

   Use the **API for listing objects in a bucket** to list all objects in the bucket. Then, check whether log files exist in the list based on the log file name prefix and **log file naming rules**.

2. **Download log files.**

   Use the **API for downloading objects** to download log files.

Using SDKs

1. **Check whether log files exist.**

   Use the following SDKs to list all objects in the bucket. Then, check whether log files exist in the list based on the log file name prefix and **log file naming rules**.

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

2. **Download log files.**

   Use the following SDKs to download log files.

Java	Python	C	Go	BrowserJS	.NET	Android	iOS	PHP	Node.js

Using the CLI Tool - obsutil

1. **Check whether log files exist.**

   List all objects in the bucket by referring to **Listing Objects**. Then, check whether log files exist in the list based on the log file name prefix and **log file naming rules**.

2. **Download log files.**

   Download log files by referring to **Downloading an Object**.

Disabling Logging for a Bucket

Uploading and storing bucket logs will incur costs for PUT requests and storage. If you no longer need to record logs, disable logging for the bucket. After logging is disabled, OBS stops recording new logs, but existing logs in the log storage bucket will be retained.

You can use **OBS Console** to disable logging for a bucket.

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Using OBS Console

Step 1 In the navigation pane of **OBS Console**, choose **Object Storage**.

Step 2 In the bucket list, click the bucket you want to operate. The **Objects** page is displayed.

Step 3 In the navigation pane, choose **Overview**.

Step 4 In the **Basic Configurations** area, click **Logging**. The **Logging** dialog box is displayed.

Step 5 Select **Disable** and then click **OK**.

----End

References

Creating an Agency for Uploading Logs

Step 1 In the **Logging** dialog box, click **Create Agency** to jump to the **Agencies** page on the **Identity and Access Management** console.

Step 2 Click **Create Agency**. On the displayed page, set the parameters related to the agency for uploading logs and retain the default settings for other parameters.

Table 10-13 Parameters

Parameter	Description
Agency Name	Name of the agency to be created The agency name cannot be left blank.
Agency Type	You can grant permissions to another account or cloud service for managing resources in your account. Select **Cloud service** for **Agency Type**.
Cloud Service	You can grant permissions to a cloud service for managing resources in your account. This parameter is mandatory when **Agency Type** is set to **Cloud service**. Select **Object Storage Service (OBS)** for **Cloud Service**.

Step 3 Click **OK**. In the **Agency Created** dialog box that is displayed, click **Cancel**. If the newly created agency is displayed in the agency list, the agency is created successfully.

Step 4 Create a custom policy to grant OBS permissions to the agency. If a policy that meets the requirements already exists, skip this step.

1. In the navigation pane of the **IAM console**, choose **Permissions** > **Policies/Roles**.
2. On the **Policies/Roles** page, click **Create Custom Policy** in the upper right corner.

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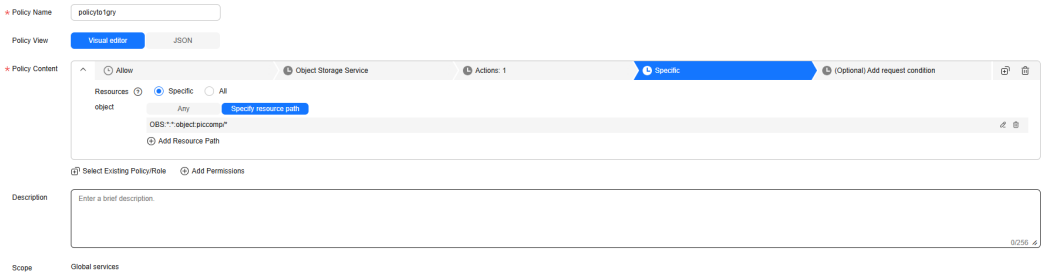
3. On the **Create Custom Policy** page, set the parameters as follows and retain the default settings for other parameters.

   Figure 10-8 Configuring a custom policy

   - **Policy Name**: Enter a name that is easy to remember.
   - **Select service**: Select **Object Storage Service (OBS)**.
   - **Actions**: Select **obs:object:PutObject**.
   - **Resources**: Select **Specific**.

     object: Select **Specify resource path**. The resource path format is **OBS:*:*:object:***Bucket name/Object name*.

     Replace *Bucket name* with the name of the log storage bucket. For example, **OBS:*:*:object:piccomp/*** indicates all objects in the log storage bucket **piccomp**.

4. Click **OK**. If the created custom policy is displayed in the policy list, the policy is created successfully.

Step 5 Grant OBS permissions to the created agency.

1. In the navigation pane of the **IAM console**, choose **Agencies**.
2. Click **Authorize** in the **Operation** column of the agency created in **Step 2**.
3. On the **Select Policy/Role** page, select the custom policy created in **Step 4** and click **Next**.
4. On the **Select Scope** page, select **All resources** and click **OK**.
5. In the **Information** dialog box that is displayed, click **OK**.
6. On the **Finish** page, click **Finish**.

Step 6 (Optional) If the log storage bucket has server-side encryption enabled, the agency also requires the **KMS Administrator** permission for the region where the bucket is located.

1. In the navigation pane of the **IAM console**, choose **Agencies**.
2. Click **Authorize** in the **Operation** column of the agency created in **Step 2**.
3. On the **Select Policy/Role** page, search for and select **KMS Administrator**. Then, click **Next**.
4. Select **Region-specific projects** for **Scope**, and select the project in the region where the log bucket resides.
5. Click **OK**.

----End

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11 Parallel File System

11.1 Parallel File System Overview

About Parallel File System

Parallel File System is a high-performance semantic file system provided by OBS. It aims to provide solutions for big data scenarios where OBS is used as the unified data lake storage. It features access latency in milliseconds, TB/s-level bandwidth, millions of IOPS, and high compatibility, performance, scalability, and reliability.

Different from the bucket structure, each directory in the access path of a parallel file system is independent. For example, **/dir01/dir02/example.txt** is a file and **/dir01/** and **/dir01/dir02/** are directories. In a hierarchical directory structure, you can just rename a single directory. You do not need to list and modify all files with a specific directory prefix.

For details about the differences between a parallel file system and a bucket, see **Compatibility Between OBS Bucket APIs and Parallel File Systems**.

Application Scenarios

Using OBS to Decouple Storage from Compute in Big Data Scenarios

Using Parallel File Systems

You can use the **console** and REST APIs to process files stored in a parallel file system anytime, anywhere and retrieve the processed files quickly.

The table below describes the ways to use parallel file systems in detail.

NOTE

The access permissions required for OBS buckets also apply to parallel file systems. Before accessing data in parallel file systems, make sure that you have the permissions.

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Table 11-1 Ways to use parallel file systems

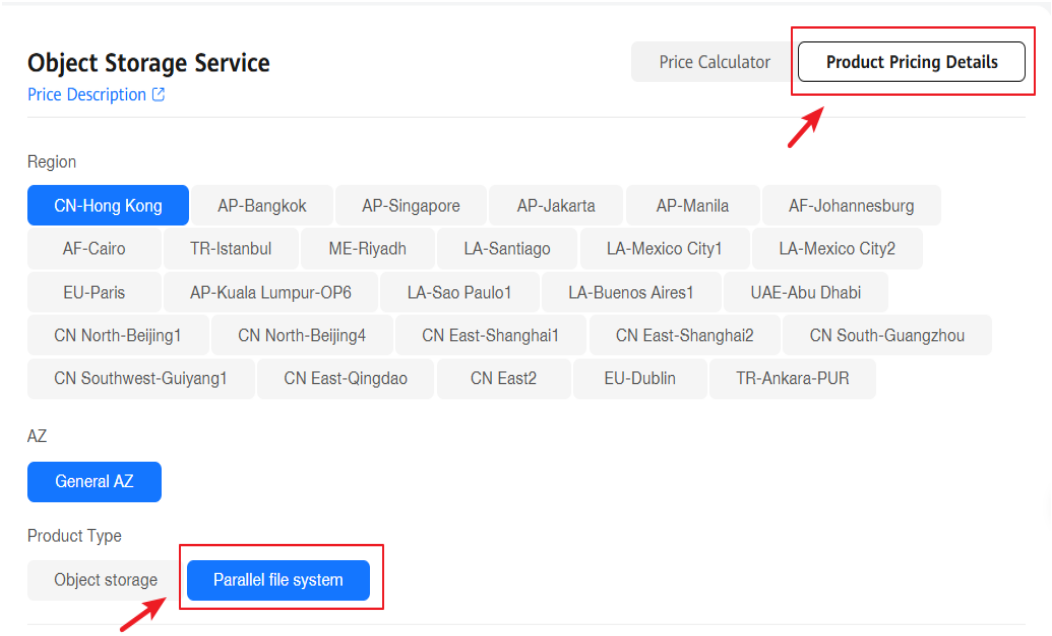
Tool	Function	Reference
Parallel file system **console**	On the **console**, you can create parallel file systems and manage them.	**Creating a Parallel File System**
OBS API	You can make API calls to use parallel file systems.	**Compatibility Between OBS Bucket APIs and Parallel File Systems**
OBSA-HDFS	In the big data scenario where OBS is used as the unified data lake storage, OBSA-HDFS is required for using parallel file systems.	**Using OBS to Decouple Storage from Compute in Big Data Scenarios** **OBSA-HDFS**
Other OBS tools	You can use tools provided by OBS, such as obsutil and OBS Browser+, to use parallel file systems. Parallel file systems do not support s3fs.	**OBS Tools**

Billing

The billing rules of parallel file systems are the same as those of OBS buckets. Both pay-per-use and yearly/monthly (resource packages) billing modes are supported. The resource packages you purchase can be used for both buckets and parallel file systems that meet the requirements. For details, see **Resource Package Overview**.

For the detailed billing rules, see **Figure 11-1** in **Product Pricing Details**.

Figure 11-1 Parallel file system pricing details



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11.2 Parallel File System Features

Compatibility Between OBS Bucket APIs and Parallel File Systems

You can call some OBS bucket APIs to use parallel file systems. There may be additional requirements when you call these APIs.

For details about the OBS bucket APIs, see **Object Storage Service API Reference**.

APIs for Basic Bucket Operations

Table 11-2 APIs for basic bucket operations

API	Compatible with Parallel File Systems	Differences
Listing buckets	√	The **x-obs-bucket-type:POSIX** header is required for obtaining the list of parallel file systems.
Creating a bucket	√	The **x-obs-fs-file-interface:Enabled** header is required for creating a parallel file system.
Listing objects in a bucket	√	-
Obtaining bucket metadata	√	-
Obtaining location of a bucket	√	-
Deleting a bucket	√	-

APIs for Advanced Bucket Settings

Table 11-3 APIs for advanced bucket settings

API	Compatible with Parallel File Systems	Differences
Configuring a bucket policy	√	-

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API	Compatible with Parallel File Systems	Differences
Obtaining a bucket policy	√	-
Deleting a bucket policy	√	-
Configuring a bucket ACL	√	-
Obtaining bucket ACL information	√	-
Configuring logging for a bucket	√	-
Obtaining a bucket logging configuration	√	-
Configuring bucket lifecycle rules	√	See **Lifecycle Management**
Obtaining bucket lifecycle rules	√	-
Deleting bucket lifecycle rules	√	-
Configuring versioning for a bucket	×	-
Obtaining bucket versioning status	×	-
Configuring event notification for a bucket	√	-
Obtaining the event notification configuration of a bucket	√	-
Configuring storage class for a bucket	×	-
Obtaining bucket storage class information	×	-
Configuring cross-region replication for a bucket	×	-

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API	Compatible with Parallel File Systems	Differences
Obtaining the cross-region replication configuration of a bucket	×	-
Deleting the cross-region replication configuration of a bucket	×	-
Configuring tags for a bucket	√	-
Obtaining bucket tags	√	-
Deleting bucket tags	√	-
Configuring bucket storage quota	√	-
Querying bucket storage quota	√	-
Querying information about used space in a bucket	√	-
Configuring bucket inventories	×	-
Obtaining bucket inventories	×	-
Listing bucket inventories	×	-
Deleting bucket inventories	×	-
Configuring a custom domain name for a bucket	√	-
Obtaining the custom domain name of a bucket	√	-
Deleting a custom domain name of a bucket	√	-

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API	Compatible with Parallel File Systems	Differences
Configuring bucket encryption	×	-
Obtaining bucket encryption configuration	×	-
Deleting the encryption configuration of a bucket	×	-
Configuring direct reading for Archive objects in a bucket	√	-
Obtaining direct reading configuration for Archive objects in a bucket	√	-
Deleting direct reading configuration for Archive objects in a bucket	√	-
Configuring mirroring-based back-to-source rules	×	-
Obtaining mirroring-based back-to-source rules	×	-
Deleting mirroring-based back-to-source rules	×	-
Configuring online decompression policies	×	-
Obtaining online decompression policies	×	-
Deleting online decompression policies	×	-
Configuring a default WORM policy for a bucket	×	-

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API	Compatible with Parallel File Systems	Differences
Obtaining the default WORM policy of a bucket	×	-
Configuring static website hosting for a bucket	×	-
Obtaining the static website hosting configuration of a bucket	×	-
Deleting the static website hosting configuration of a bucket	×	-
Configuring bucket CORS	√	-
Obtaining the CORS configuration of a bucket	√	-
Deleting the CORS configuration of a bucket	√	-
Checking bucket OPTIONS	×	-
Checking object OPTIONS	×	-

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APIs for Object Operations

Table 11-4 APIs for object operations

API	Compatible with Parallel File Systems	Differences
Uploading an object with PUT	√	• Headers not supported: **x-obs-storage-class**, **x-obs-website-redirect-location**, **success-action-redirect**, and **x-obs-expires** • Objects uploaded using this API cannot be directly stored in the Infrequent Access or Archive storage class and are stored in the Standard storage class by default. You can later change the storage class by using a lifecycle rule or modifying the metadata. • Directories that do not exist in the request path can be automatically created. For example, if you perform the following PUT operation and there is the **dir01** directory in the parallel file system but there are no **dir02** and **dir03** directories, the **dir02** and **dir03** directories are automatically created. That is, after the command is executed successfully, **dir02** and **dir03** directories and **file01** object are created. `PUT /dir01/dir02/dir03/file01 HTTP/1.1`
Uploading an object with POST	√	Headers not supported: **x-obs-storage-class**, **x-obs-website-redirect-location**, **success-action-redirect**, and **x-obs-expires**
Copying an object	√	Data can be replicated only between parallel file systems or buckets that are in the same cluster.
Downloading an object	√	-
Obtaining object metadata	√	-
Deleting an object	√	-
Batch deleting objects	√	-

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API	Compatible with Parallel File Systems	Differences
Restoring Archive objects	√	-
Appending data to an object	×	Parallel file systems do not support this API. You can obtain the file length by calling the API for obtaining object metadata and then call the API for modifying an object to append data.
Configuring object ACL	√	-
Obtaining an object ACL	√	-
Modifying object metadata	√	In a parallel file system, the storage class of a directory cannot be changed. To change the storage class of a file in the directory, modify the metadata of the file or use a lifecycle rule to change the storage class of files in batches.
Modifying an object	√	This API is only for parallel file systems and is not supported for OBS buckets.
Truncating an object	√	This API is only for parallel file systems and is not supported for OBS buckets.
Renaming an object	√	This API is only for parallel file systems and is not supported for OBS buckets.
Configuring object tags	×	-
Obtaining object tags	×	-
Deleting object tags	×	-
Configuring WORM retention for an object	×	-

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APIs for Multipart Uploads

Table 11-5 APIs for multipart uploads

API	Compatible with Parallel File Systems	Differences
Listing the initiated multipart uploads in a bucket	√	-
Initiating a multipart upload	√	-
Uploading parts	√	-
Copying parts	√	Copying parts is not supported for an appended file.
Listing uploaded parts	√	-
Assembling parts	√	-
Aborting the multipart upload task	√	-

Permissions Configuration

The use cases and main functions of object access control also work on files in parallel file systems. For more information, see **Permissions Configuration Guide**.

Differences Between File and Object Permission Configurations

To exactly match a specific directory, the resource path in the policy must end with a slash (/). When checking permissions, parallel file systems consider objects as directories. Since objects do not end with a slash (/), a parallel file system will add a slash (/) to the end of objects and then perform a policy matching.

IAM Permission Configuration Examples

Example 1: Grant a user the permissions required to download **dir_1**, excluding its subdirectories.

In the following configuration, the resource path ends with a slash (/). In such case, a success response can be returned when **dir_1** or **dir_1/** is contained in the URL of a head request.

Note that this configuration is not applied to subdirectories or files in **dir_1**. Therefore, a failure response will be returned if a head request is sent to **dir_1/file1**.

```
{
    "Version": "1.1",
```

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```
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "obs:object:GetObject",
      ],
      "Resource": [
        "obs:*:*:object:examplebucket/dir_1/",
      ]
    }
  ]
}
```

Example 2: Grant a user the permissions required to download **dir_1** and its subdirectories.

In the following configuration, the resource path uses prefix-based matching and ends with a wildcard (*). In such case, a success response can be returned when a head request is sent to **dir_1/file1**.

```
{
  "Version": "1.1",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "obs:object:GetObject",
      ],
      "Resource": [
        "obs:*:*:object:examplebucket/dir_1/*",
      ]
    }
  ]
}
```

Policy Configuration Examples

Example: Grant a user the permissions required to download **dir_1**, excluding its subdirectories.

In the following configuration, the resource path ends with a slash (/). In such case, a success response can be returned when **dir_1** or **dir_1/** is contained in the URL of a head request.

```
{
  "Statement":[
  {
    "Sid":"test",
    "Effect":"Allow",
    "Principal": {"ID": ["domain/b4bf1b36d9ca43d984fbcb9491b6fce9:user/
71f3901173514e6988115ea2c26d1999"]},
    "Action":["*"],
    "Resource":[
      "examplebucket/dir_1/",
    ]
  }
 ]
}
```

Lifecycle Management

The use cases and main functions of object lifecycle management also work on files in parallel file systems. For more information, see **Creating a Lifecycle Rule**.

To manage the lifecycle using SDKs, see **SDK Overview**.

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Differences Between File and Object Lifecycle Management

- You can configure lifecycle rules to manage files and directories. Directories cannot be transitioned to the Archive storage class, but empty directories can be deleted upon expiration.
- Parallel file systems do not support versioning. Therefore, you cannot configure deletion upon expiration or transition between storage classes for historical versions of objects.
- Each parallel file system can have a maximum of 20 lifecycle rules.
- The time applied for a lifecycle rule to work on a file is when the data of the file was last updated.
- Lifecycle rules cannot transition files to the Deep Archive storage.
- A lifecycle rule configured for a parallel file system has limits on how many directories it can apply to. It will take longer time to execute the actions defined in the rule if:
  a. There are over 100,000 level-1 subdirectories in each directory.
  b. There are over 10 million subdirectories (folders) matching the specified prefix in total.
  c. There are over 30 million files matching the specified prefix in total.

Notes for Lifecycle Management

- If renamed files or files in a renamed directory meet the conditions specified in a lifecycle rule, the rule applies based on the most recent data update, not the renaming time. In addition, the effective time of the lifecycle rule may be delayed for up to seven days.
- For a file copy on a client, the lifecycle rule determines when to expire the file copy or transition it to the Archive storage class based on the file copy creation time.
  - For example, if a file, **src.txt**, was created on January 1, 2019, and was then copied to the **des.txt** file by running the **cp -a src.txt des.txt** command on September 1, 2019. Then the lifecycle rule calculated when to perform the specified actions on the file copy based on September 1, 2019.
- A lifecycle rule scans directories periodically, starting from the deepest directory, and deletes those meeting expiration conditions. Empty directories that meet the conditions will be deleted, while non-empty ones will be ignored. Scan intervals (usually seven days) vary depending on cluster configurations. For this mechanism, a single-level directory that meets the expiration conditions will be deleted 0 to 7 days after it has been emptied. Accordingly, a two-level directory will be deleted 0 to 14 days after it has been emptied. Each time a directory level is added, the waiting time for deletion increases by seven days.
- If a file or directory is mistakenly stored under a path whose prefix matches the filter in a lifecycle rule, it must be removed at least 24 hours before the rule is scheduled to apply. If you remove the file or directory less than 24 hours before it will be processed by the lifecycle rule, the file or directory may still be processed.

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11.3 Constraints of PFS

Operations

- An existing OBS bucket cannot be changed to a parallel file system. For details about how to create a parallel file system, see **Creating a Parallel File System**.
- Custom domain names of parallel file systems cannot be configured on OBS Console. You can configure them using APIs by referring to **Configuring a Custom Domain Name**.

Functions

- **Image processing** cannot be used to process (such as slim, resize, or watermark) images stored in parallel file systems.
- Server-side encryption is not supported.
- Cross-region replication is not supported.
- Versioning is not supported.
- Bucket inventory is not supported.
- Static website hosting is not supported.
- Configuration of default storage class for a parallel file system is not supported.
- Deep Archive storage is not supported.
- A parallel file system can be mounted to multiple Linux servers for concurrent reads, but this is not recommended for concurrent writes.

Performance

- A parallel file system provides a maximum bandwidth of 16 Mbit/s per TB by default.

Naming

- In a parallel file system, a file name cannot contain two consecutive slashes (//). For example, if you name a file as **test//123.txt**, an error will be reported.

11.4 Creating a Parallel File System

You can create a parallel file system on OBS Console.

Procedure

Step 1 Log in to the parallel file system **console**.

Step 2 In the upper right corner of the page, click **Create Parallel File System**.

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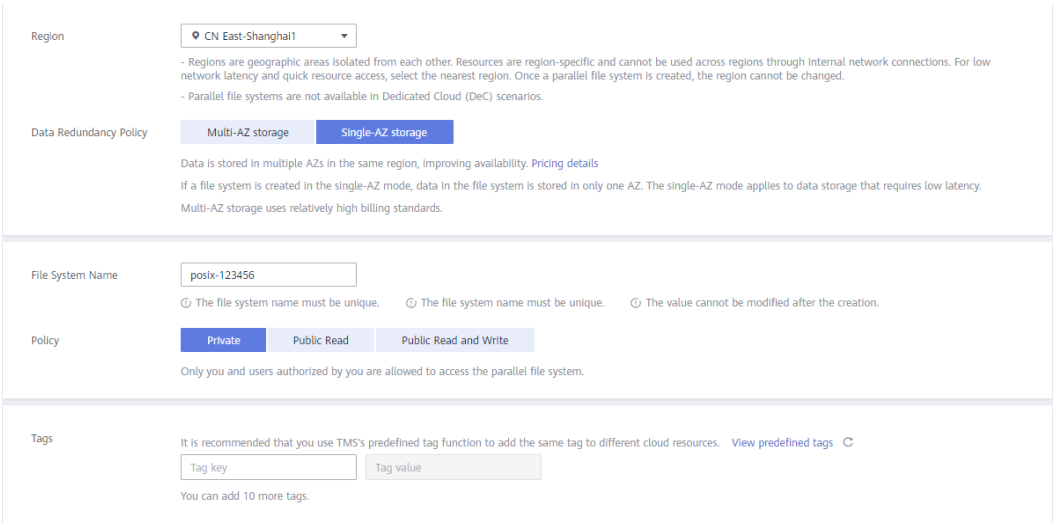
Figure 11-2 Creating a parallel file system



Step 3 Select a region and enter a name for the parallel file system.

NOTE

- Once a parallel file system is created, its name cannot be changed.
- URLs do not support uppercase letters and cannot distinguish between names containing uppercase or lowercase letters. Therefore, a parallel file system name can contain only lowercase letters, digits, periods (.), and hyphens (-). For example, if you attempt to access the parallel file system **MyFileSystem** using a URL, the file system name will be resolved to **myfilesystem**, causing an access error.

Step 4 Configure a data redundancy policy. If you select multi-AZ storage, data will be stored in multiple AZs for a higher reliability.

NOTE

Once a parallel file system is created, you cannot change the data redundancy policy, so take care when selecting a data redundancy policy.

Step 5 Configure a policy. You can select **Private**, **Public Read**, or **Public Read/Write** for the parallel file system.

Step 6 Configure direct reading. With direct reading enabled, you can directly download files in the Archive storage class without restoring them first. Direct reading is a billable function. For details, see **Product Pricing Details**.

Step 7 (Optional) Add tags. Tags are used to identify parallel file systems in OBS, for the purpose of classification. Each tag is represented by one key-value pair. For details about how to add a tag, see **Tags**.

Step 8 (Optional) Buy storage packages. By default, you are billed on a pay-per-use basis for using parallel file systems. You can also purchase **storage packages** to save more. After selecting a required package, go to the **Confirm** page to complete the purchase.

Storage packages can also be purchased after the parallel file system is created.

Step 9 Confirm the settings at the bottom of the page and click **Create Now**.

Step 10 View the file system you created just now in the parallel file system list.

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Then, you can use the parallel file system the same way you use a bucket. For details about how to use a parallel file system, see **Using Parallel File Systems**.

----End

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