

## Object Storage Service

# Product Introduction

**Issue** 04  
**Date** 2023-07-31



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# 1 About OBS

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## OBS Overview

**Object Storage Service (OBS)** is a scalable service that provides secure, reliable, and cost-effective cloud storage for massive amounts of data.

OBS provides unlimited storage capacity for objects of any format, catering to the needs of common users, websites, enterprises, and developers. There is no limitation on the storage capacity of the entire OBS system or of a single bucket, and any number of objects can be stored. As a web service, OBS supports APIs over Hypertext Transfer Protocol (HTTP) and Hypertext Transfer Protocol Secure (HTTPS). You can use OBS Console or OBS tools to access and manage data stored in OBS anytime, anywhere. With OBS SDKs and APIs, you can easily manage data stored in OBS and develop upper-layer applications.

Huawei Cloud deploys OBS infrastructures in multiple regions across the globe, delivering high scalability and reliability. You can deploy OBS in specific regions for faster access at an affordable price.

## Product Architecture

OBS basically consists of **buckets** and **objects**.

A bucket is a container for storing objects in OBS. Each bucket is specific to a region and has specific storage class and access permissions. A bucket is accessible through its **access domain name** over the Internet.

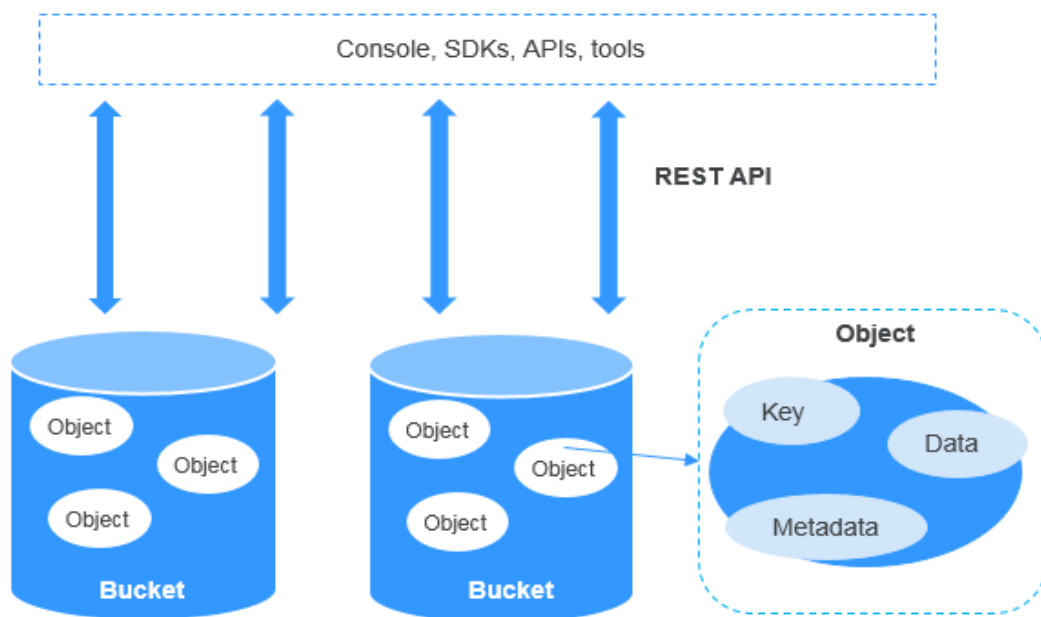
An object is the fundamental storage unit in OBS. An object consists of the following:

- A key that specifies the name of an object. An object key is a UTF-8 string up to 1,024 characters long. Each object is uniquely identified by a key within a bucket.
- Metadata that describes an object. The metadata is a set of key-value pairs that are assigned to objects stored in OBS. There are two types of metadata:
  - System-defined metadata is automatically assigned by OBS for processing objects. Such metadata includes Date, Content-Length, Last-Modified, ETag, and more.

- You can specify custom metadata to describe the object when you upload an object to OBS.
- Data that refers to the content of an object.

By means of secondary development based on OBS REST APIs, OBS Console, SDKs, and a variety of tools are provided for you to use OBS. You can also use OBS SDKs and APIs to develop applications customized for your business needs.

**Figure 1-1** Product architecture



## Storage Classes

OBS offers the storage classes below to meet your requirements for storage performance and cost. For transitions between storage classes, see . For more information about billing for different storage classes, see .

- **Standard:** The Standard storage class features low latency and high throughput. It is therefore good for storing frequently (multiple times per month) accessed files or small files (less than 1 MB). Its application scenarios include big data analytics, mobile apps, hot videos, and social apps.
- **Infrequent Access:** The Infrequent Access storage class is for storing data that is infrequently (less than 12 times per 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. This storage class has the same durability, low latency, and high throughput as the Standard storage class, with a lower cost, but its availability is slightly lower than the Standard storage class.
- **Archive:** The Archive storage class is ideal for storing data that is rarely (once per year) accessed. Its application scenarios include data archive and long-term backups. This storage class is secure, durable, and inexpensive, so it can be used to replace tape libraries. To keep cost low, it may take hours to restore data from the Archive storage class.

An object uploaded to a bucket inherits the storage class of the bucket by default. You can also specify a storage class for an object when you upload it.

Changing the storage class of a bucket does not change the storage classes of existing objects in the bucket, but newly uploaded objects will inherit the new storage class.

**Table 1-1** Comparison between storage classes

Compared Item	Standard	Infrequent Access	Archive
Feature	Top-notch performance, high reliability and availability	Reliable, inexpensive, and real-time storage access	Long-term retention of archived data at a low cost
Application scenarios	Cloud application, data sharing, content sharing, and hot data storage	Web disk applications, enterprise backup, active archiving, and data monitoring	Archive, medical image storage, video material storage, and replacement of tape libraries
<b>Designed durability</b>	99.999999999%	99.999999999%	99.999999999%
<b>Designed durability (multi-AZ)</b>	99.999999999%	99.999999999%	Multi-AZ not supported
<b>Designed availability</b>	99.99%	99%	99%
<b>Designed availability (multi-AZ)</b>	99.995%	99.5%	Multi-AZ not supported
Minimum storage duration	Not required	30 days	90 days
<b>Data restore</b>	N/A	Billed for each GB retrieved.	Data can be restored at a standard or an expedited speed. Billed for each GB restored.

 **NOTE**

Minimum storage duration refers to the least time that will be charged for object storage. This means that objects will be charged for a minimum storage duration even if they are not stored for that long. For instance, if an Infrequent Access object is stored in OBS for 20 days (shorter than the minimum storage duration of 30 days) and then deleted, you will be billed for a storage duration of 30 days.

## How to Access OBS

OBS provides various resource management tools. You can use any of the tools listed in [Table 1-2](#) to access and manage resources in OBS.

**Table 1-2** OBS resource management tools

Tool	Description	How to Use
OBS Console	OBS Console is a web-based GUI for you to easily manage OBS resources.	<a href="#">Console Operation Guide</a>
APIs	OBS offers the REST API for you to access it from web applications with ease. By making API calls, you can upload and download data anytime, anywhere over the Internet.	<a href="#">API Reference</a>

# 2 Advantages

## Comparison Between OBS and On-Premises Storage Servers

In this information era, it becomes increasingly difficult for conventional on-premises storage servers to deal with the fast growing data of enterprises. [Table 2-1](#) compares OBS with on-premises storage servers.

**Table 2-1** Comparison between OBS and on-premises storage servers

Item	OBS	On-Premises Storage Server
Storage capacity	OBS provides unlimited storage capacity, with data centers deployed across the world. All services and storage nodes are deployed in distributed clusters. You can expand each node or cluster separately, and you never have to worry about running out of space.	Such servers provide confined storage space due to the limited capacity of the hardware devices they use. When the storage space is not sufficient, you need to buy extra disks for manual expansion.
Security	OBS uses HTTPS and SSL protocols and encrypts data during uploads. To keep data transmission and access safe, OBS uses access key IDs (AKs) and secret access keys (SKs) to authenticate user identities and adopts IAM permissions, bucket policies, access control lists (ACLs), and uniform resource locator (URL) validation.	The owner and users are exposed to security risks from cyber attacks, technical vulnerabilities, and accidental operations.

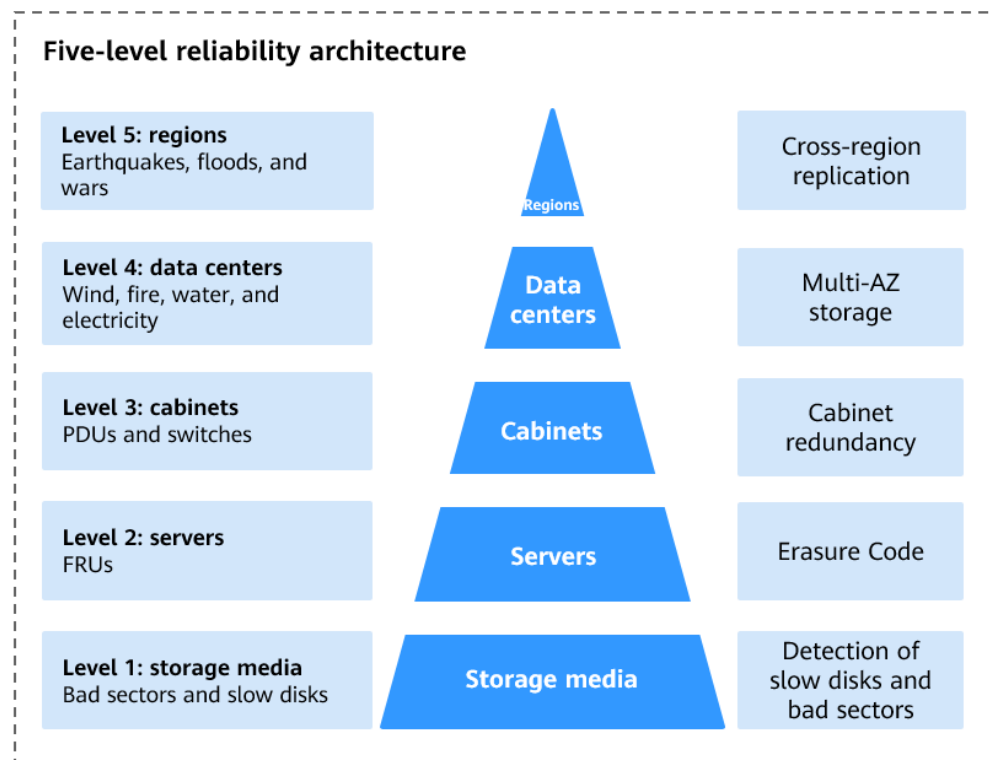


Item	OBS	On-Premises Storage Server
Reliability	The OBS five-level reliability architecture ensures up to 99.9999999999% of durability and up to 99.995% of continuity, much higher than those of the conventional architecture.	Due to limited investment, on-premises storage servers cannot ensure reliability at all levels of media, servers, cabinets, data centers, and regions. Once there is a failure or disaster, it may cause irreversible data loss to enterprises.
Costs	OBS is an out-of-the-box service that has no initial capital investment or time or labor costs and frees you from O&M.  You only need to pay as you go. OBS offers tiered-pricing, meaning the more you use, the more you will save.	The initial deployment of on-premises servers requires high investments and a long construction period, but it quickly lags behind as enterprise businesses change so fast. Additional expenditures are required to ensure security.

## OBS Advantages

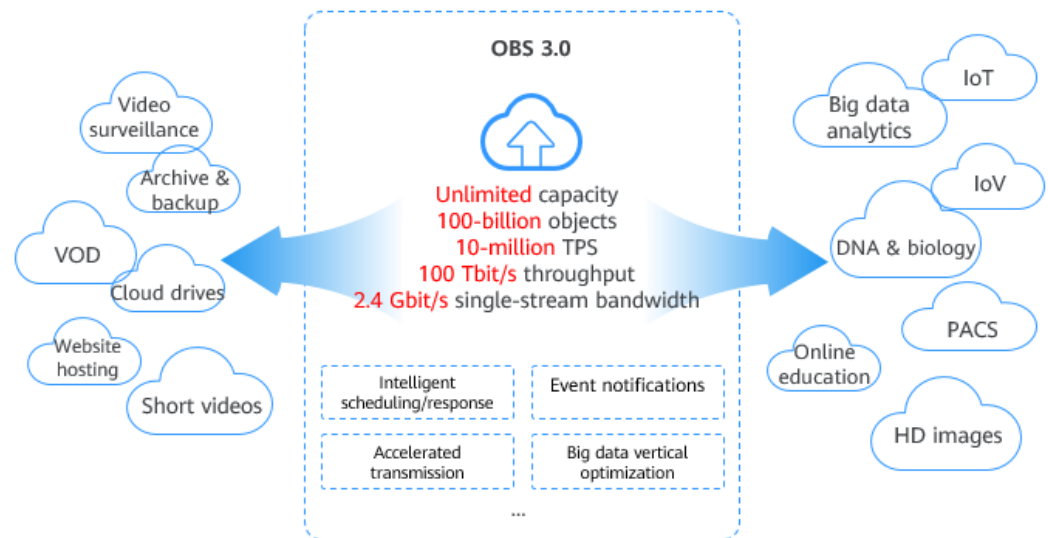
- Data durability and service continuity:** OBS provides storage for cloud albums of Huawei mobile phones to support access of hundreds of millions of users. It delivers a data durability of up to 99.9999999999% and service continuity of up to 99.995% by using cross-region replication, cross-AZ disaster recovery, device and data redundancy in an AZ, slow disk or bad sector detection, and other technologies.

Figure 2-1 Five-level reliability architecture of OBS



- **Multi-level protection and authorization management:** OBS has passed the Trusted Cloud Service (TRUCS) certification. Measures, including versioning, server-side encryption, URL validation, virtual private cloud (VPC)-based network isolation, access log audit, and fine-grained access control are provided to keep data secure and trusted.
- **100-billion level objects, 10-million level concurrency:** With intelligent scheduling and response, optimized data access paths, and technologies such as transmission acceleration, and big data vertical optimization, you can store hundreds of billions of objects in OBS, and still experience smooth concurrency, ultra-high bandwidth, and low latency.

**Figure 2-2** Access to numerous objects at high-level concurrency



- **Easy use and management:** OBS provides standard REST APIs, SDKs in different programming languages, and data migration tools to help you quickly move your workloads to cloud. Storage resources are linearly, infinitely scalable, without compromising performance. You do not have to plan storage capacity beforehand or worry expansion or reduction. When needed, you can ask Huawei Cloud to perform online upgrade or capacity expansion on your behalf.
- **Tiered storage and on-demand use:** Both pay-per-use and yearly/monthly billing are available for OBS. Data in each of the Standard, Infrequent Access, and Archive storage classes is separately metered and charged, which reduces storage costs.

# 3 Application Scenarios

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## Big Data Analytics

### Scenario Description

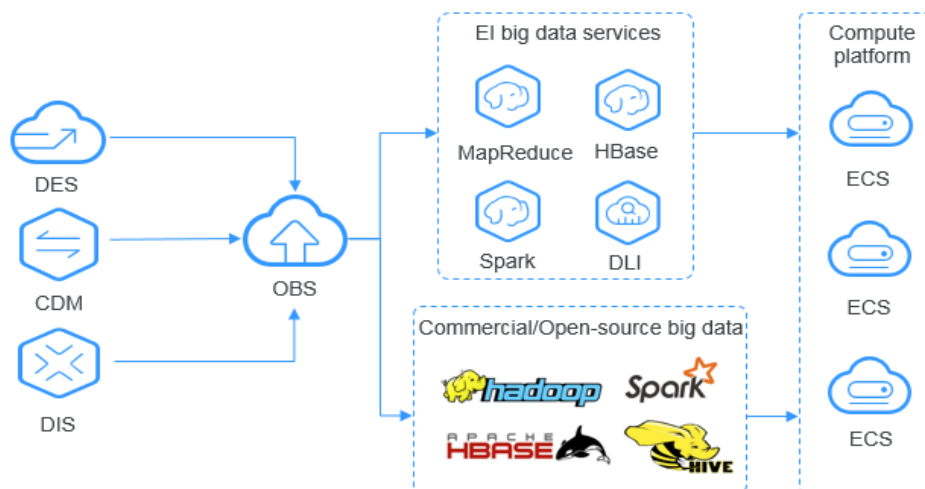
OBS enables inexpensive big data solutions that feature high performance with zero service interruptions. It eliminates the need for capacity expansion. Such solutions are designed for scenarios that involve mass data storage and analysis, query of historical data details, analysis of numerous behavior logs, and statistical analysis of public transactions.

- Mass data storage and analysis: storage of petabytes of data, batch data analysis, and data query in milliseconds
- Query of historical data details: account statement audit, analysis on device energy consumption history, playback of trails, analysis on vehicle driving behavior, and refined monitoring
- Analysis of numerous behavior logs: analysis of learning habits and logs
- Statistical analysis on public transactions: crime tracking, associated case queries, traffic congestion analysis, and scenic spot popularity statistics

You can migrate data to OBS with Data Express Service (DES), and then use Huawei Cloud big data services like MapReduce Service (MRS) or open-source computing frameworks such as Hadoop and Spark to analyze data stored in OBS. Such analysis results will be returned to your programs or applications on Elastic Cloud Servers (ECSs).

### Recommended Services

MRS, ECS, and DES

**Figure 3-1** Big data analytics

## Static Website Hosting

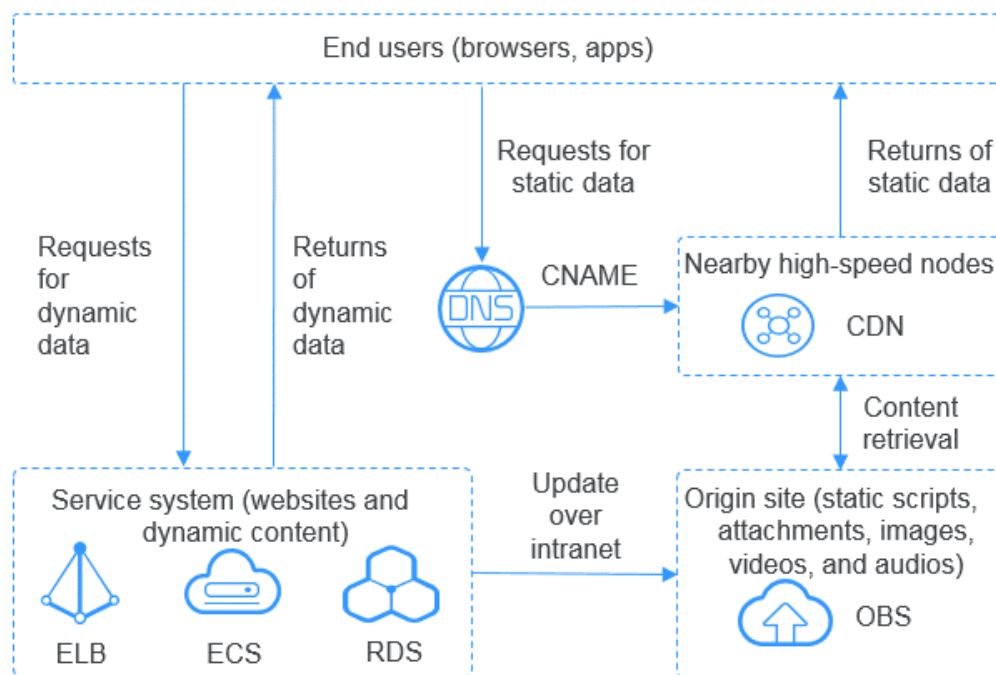
### Scenario Description

OBS provides a website hosting function that is cost-effective, highly available, and scalable to traffic changes. By combining the OBS static website hosting, CDN, and ECS, you can quickly build a website or an application system with separate static and dynamic content.

The dynamic data on end user browsers and apps directly interacts with the service systems deployed on Huawei Cloud. Requests for dynamic data are sent to service systems for processing and then returned to end users. The static data is stored in OBS. Business systems can process static data over the intranet. End users directly request and read the static data from OBS through nearby high-speed nodes.

### Recommended Services

Content Delivery Network (CDN) and Elastic Cloud Server (ECS)

**Figure 3-2** Static website hosting

## Online VOD

### Scenario Description

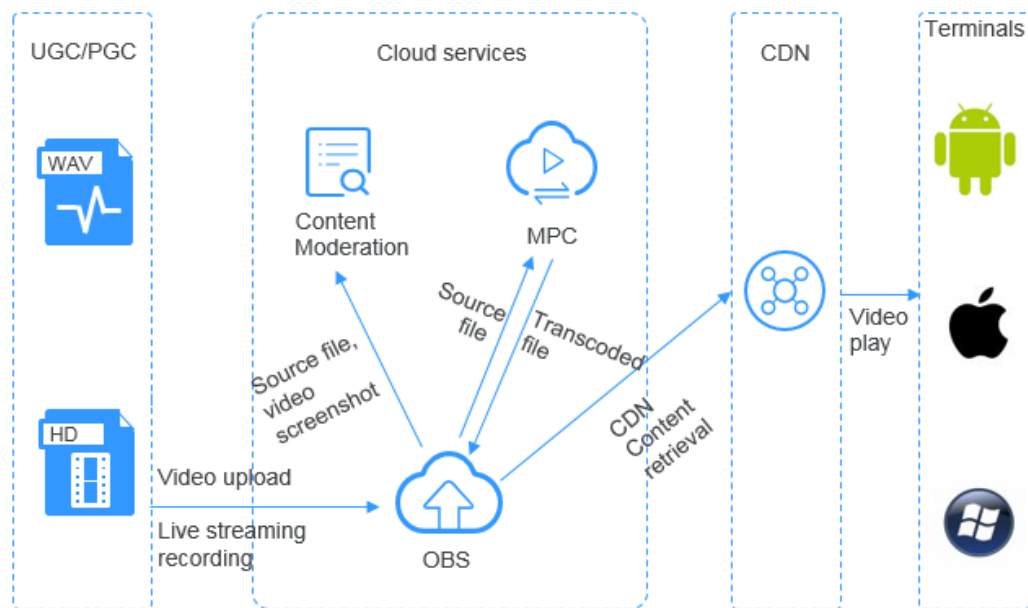
The OBS storage system is scalable, highly reliable, and cost-effective, featuring high concurrency and low latency. Working with the MPC, Content Moderation, and CDN services, OBS can help you quickly construct a fast, secure, and highly available online VOD platform.

OBS serves as the origin server of VOD services. Normal Internet users or professional content creators can upload their video files to OBS, use Content Moderation to review video content, and use MPC to transcode source video files. The processed video content then is played on devices after CDN acceleration.

### Recommended Services

Content delivery network (CDN), Media Processing Center (MPC), and Content Moderation

**Figure 3-3 VOD**



## DNA Sequencing

### Scenario Description

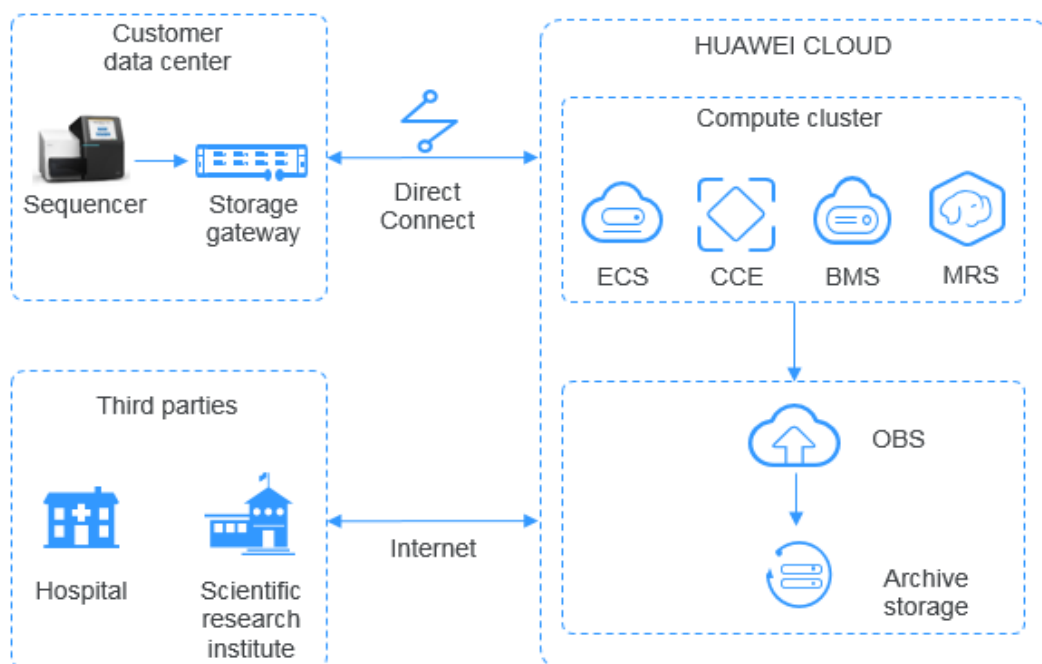
OBS is a reliable, cost-effective system for storing massive amounts of data and features high concurrency and low latency. It works with compute services on Huawei Cloud to help you easily build a DNA sequencing platform.

You can use Direct Connect to automatically upload data from the sequencer in your data center to Huawei Cloud. You can then perform data analysis on the compute cluster (including ECS, CCE, and MRS services), and the analysis results will be stored in OBS. After an analysis is completed, the source DNA data will be automatically stored in the Archive storage class in OBS, and the sequencing results can be distributed to hospitals and scientific research institutes over the Internet.

### Recommended Services

Elastic Cloud Server (ECS), Bare Metal Server (BMS), MapReduce Service (MRS), Cloud Container Engine (CCE), and Direct Connect (DC)

**Figure 3-4** DNA sequencing



## Intelligent Video Surveillance

### Scenario Description

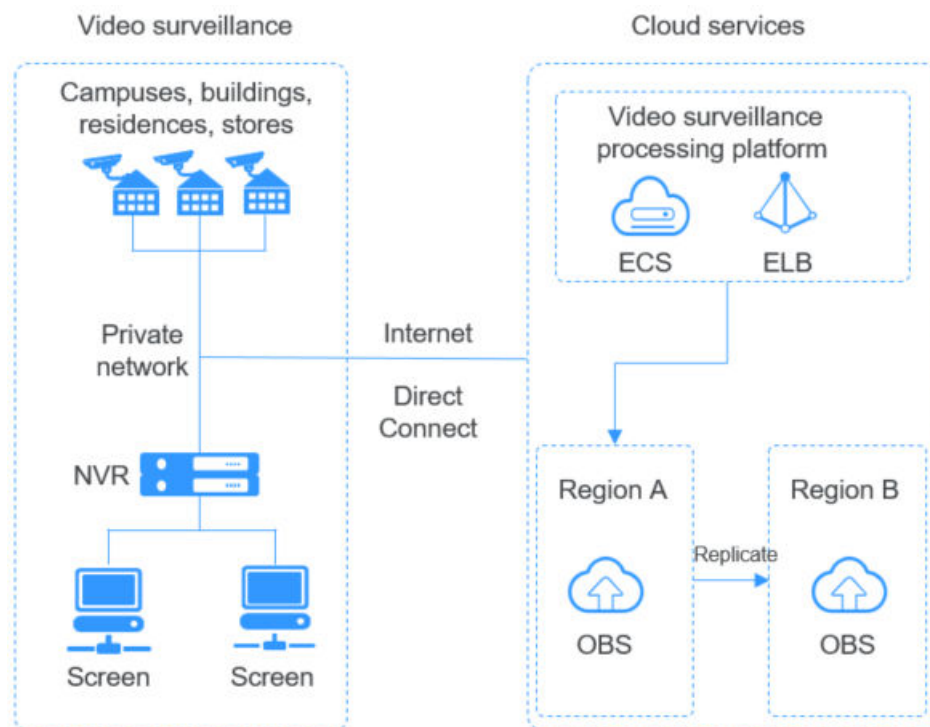
OBS provides reliable, inexpensive storage for virtually any amount of data. It has high performance and low latency and offers end-to-end solutions that cover device management, video surveillance, video processing, and more. Such solutions are ideal for individuals and enterprises alike.

### Recommended Services

Elastic Load Balance (ELB) and Elastic Cloud Server (ECS)



**Figure 3-5** Video surveillance



## Backup and Archiving

### Scenario Description

OBS offers a highly reliable, inexpensive storage system featuring high concurrency and low latency. It can hold massive amounts of data, meeting the archive needs for unstructured data of applications and databases.

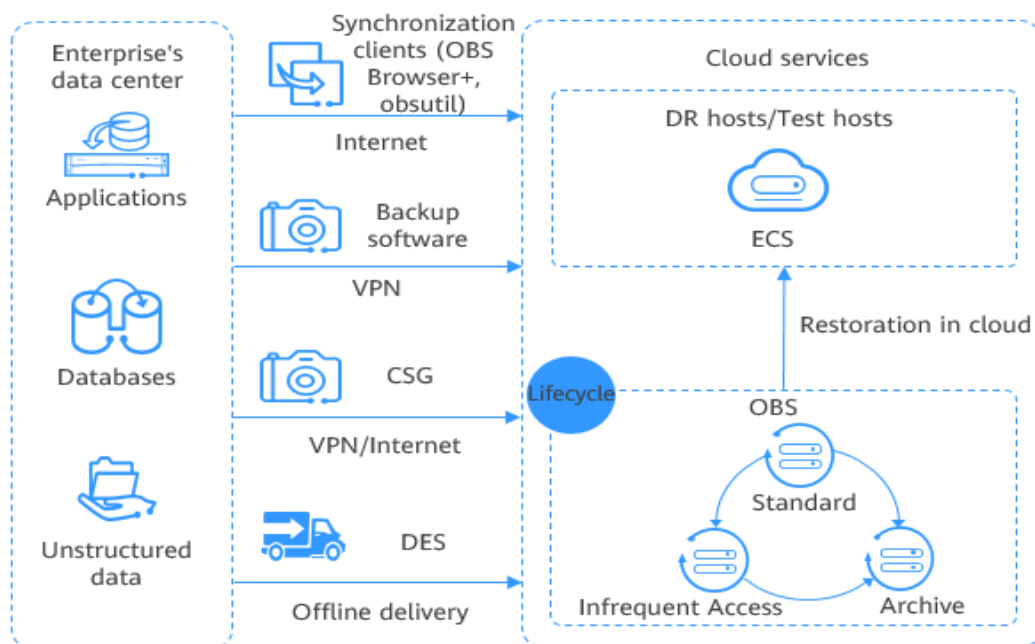
You can use the synchronization clients (such as OBS Browser+ and obsutil), Cloud Storage Gateway (CSG), DES, or mainstream backup software to back up your on-premises data to OBS. OBS also provides lifecycle rules to automatically transition objects between storage classes to save your money on storage. You can restore data from OBS to a DR or test host on the cloud.

- Synchronization clients: good for manual backup of a single database or program
- Backup software: applicable to automatic backup for multiple applications or hosts, delivering strong compatibility
- CSG: seamlessly compatible with on-premises backup systems
- DES: ideal for archiving massive volumes of data. It transfers data using Teleport devices and disks to cloud.

### Recommended Services

Data Express Service (DES) and Elastic Cloud Server (ECS)

**Figure 3-6 Backup and archiving**



## High-Performance Computing

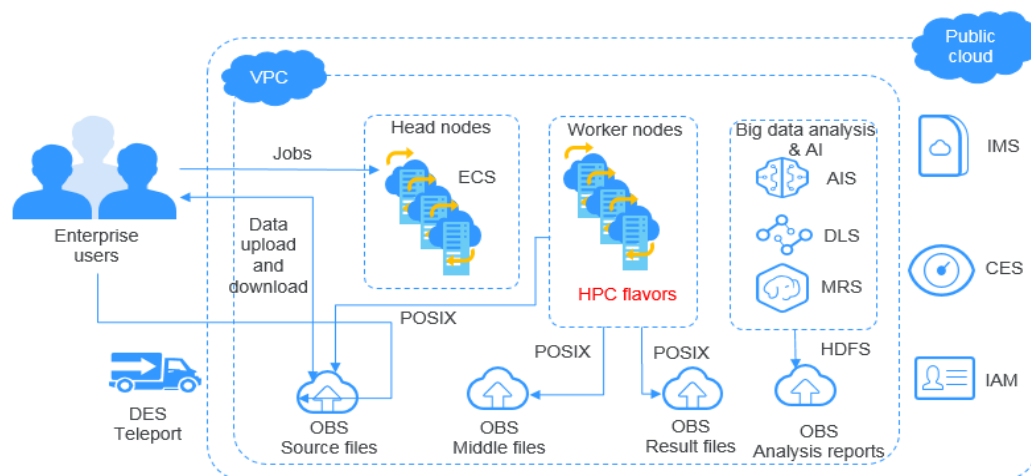
### Scenario Description

OBS works with cloud services such as ECS, AS, EVS, IMS, IAM, and Cloud Eye to provide reliable high-performance computing (HPC) solutions. These solutions have huge capacity and large single-stream bandwidth.

In HPC scenarios, enterprises can directly upload data to OBS or migrate data to OBS by using DES. The POSIX and HDFS of OBS allow you to mount buckets to HPC flavor nodes, as well as big data and AI applications. This facilitates high-performance computing by providing efficient and convenient data, write, and storage capabilities.

### Recommended Services

Data Express Service (DES), Elastic Cloud Server (ECS), Auto Scaling (AS), Image Management Service (IMS), Cloud Eye, and Identity and Access Management (IAM)

**Figure 3-7** High-performance computing

## Enterprise Cloud Boxes (Web Disks)

### Scenario Description

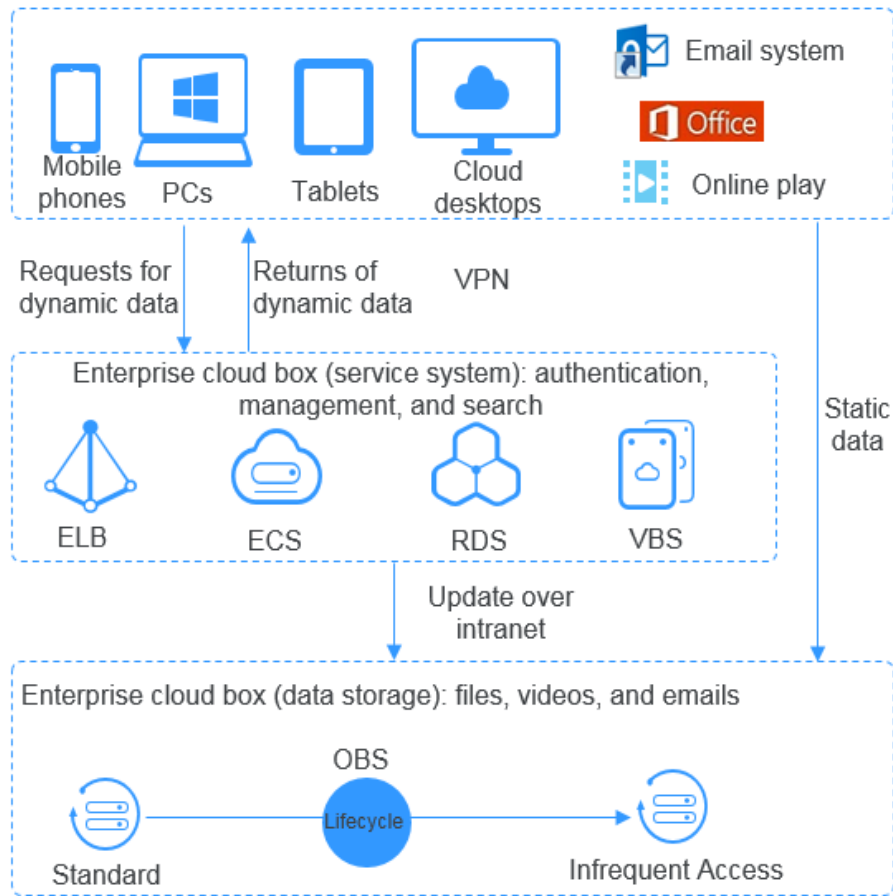
OBS works with cloud services such as ECS, ELB, RDS, and VBS to provide enterprise web disks with a reliable, inexpensive storage system featuring low latency and high concurrency. The storage capacity automatically scales as the volume of stored data grows.

Dynamic data on devices such as mobile phones, PCs, and tablets interacts with the enterprise cloud disk service system built on Huawei Cloud. Requests for dynamic data are sent to the service system for processing and then returned to devices, and the static data is stored in OBS. Service systems can process static data over the intranet. End users can directly request and read the static data from OBS. In addition, OBS provides the lifecycle management function to automatically change storage classes for objects, reducing storage costs.

### Recommended Services

Elastic Cloud Server (ECS), Elastic Load Balance (ELB), Relational Database Service (RDS), and Volume Backup Service (VBS)

Figure 3-8 Enterprise cloud boxes (web disks)



# 4 Functions

**Table 4-1** lists the basic functions of OBS.

It is recommended that you get familiar with the **basic concepts** of OBS before using OBS.

**Table 4-1** OBS functions

Function	Description	OBS 2.0	OBS 3.0
<b>Storage classes</b>	OBS offers the Standard, Infrequent Access, and Archive storage classes, to meet different requirements for storage performance and cost.	Supported	Supported
<b>Bucket management</b>	Buckets are containers that store objects in OBS. OBS provides easy bucket management. You can conveniently create, list, search for, view, and delete buckets.	Supported	Supported
<b>Object management</b>	Objects are the fundamental entities stored in OBS. You can perform the following operations on objects: upload, download, listing, searching, resumable transfer, and multipart uploads.	Supported	Supported
<b>Permission management</b>	OBS uses IAM permissions, bucket policies, object policies, and ACLs for access control. You can grant access to different accounts and users, and also configure policies or ACLs for buckets and objects to control read and write permissions for them.	Supported	Supported

Function	Description	OBS 2.0	OBS 3.0
<b>Server-side encryption</b>	To enhance data security, OBS uses server-side encryption to encrypt data before storing it. The used encryption method is SSE-KMS.	Supported	Supported
<b>Lifecycle management</b>	You can configure lifecycle rules to automatically delete objects or transition objects between storage classes.	Supported	Supported
<b>Static website hosting</b>	You can upload static website files to your OBS bucket, grant the read permission for these files to anonymous users, and configure static website hosting for the bucket to host them.	Supported	Supported
<b>CORS</b>	Cross-origin resource sharing (CORS) is a browser-standard mechanism defined by the World Wide Web Consortium (W3C). It allows a web client in one origin to interact with resources in another one. For general web page requests, website scripts and contents in one origin cannot interact with those in another because of Same Origin Policies (SOPs). OBS supports CORS rules for resources in it to be accessed across origins.	Supported	Supported
<b>URL validation</b>	URL validation protects your data in OBS from being stolen using the <b>Referer</b> field in HTTP requests. Such authorization is controlled using whitelists and blacklists.	Supported	Supported
<b>Event notifications</b>	You can use this feature to receive Simple Message Notification (SMN) notifications when certain events happen in your OBS bucket.	Supported	Supported

Function	Description	OBS 2.0	OBS 3.0
<b>Bucket tags</b>	Tags are provided for you to identify and classify OBS buckets. If you add tags to a bucket, charging data records (CDRs) generated for it will be labeled with these tags. You can classify CDRs by tag for cost analysis.	Supported	Supported
<b>User-defined domain names</b>	You can bind a domain name to an OBS bucket and then use this domain name to access data in the bucket. For instance, if you need to migrate files from a website to OBS while keeping the website address unchanged, you can bind the website domain name to an OBS bucket.	Not supported	Supported
<b>Bucket inventories</b>	Bucket inventories help you manage objects. You can configure a bucket inventory rule for OBS to periodically scan the specified objects, list the objects with their properties (such as metadata, size, modification time, and storage class) in CSV files, and store the files into the specified bucket.	Not supported	Supported
<b>Parallel file systems</b>	Parallel File System (PFS) is a high-performance file system with access latency in milliseconds. It supports TB/s-level bandwidth and millions of IOPS, which is ideal for processing high-performance computing (HPC) workloads. You can call standard OBS APIs to read data in a parallel file system, or use obsfs, an OBS tool, to mount a parallel file system to a Linux server in the cloud. Migrating files and directories in a parallel file system is just like operating a local file system.	Not supported	Supported

Function	Description	OBS 2.0	OBS 3.0
<b>Logging</b>	With logging, you can obtain the bucket access data. After logging is enabled for a bucket, OBS automatically logs every access request for the bucket, packs multiple log records into a log file, and saves the log file to the specified bucket. Using the stored logs, you can analyze or audit logs.	Supported	Supported
<b>Versioning</b>	When versioning is enabled for a bucket, OBS can keep multiple versions of an object in the bucket. That way you can quickly retrieve and restore every object version as needed, or recover data from both accidental actions and application failures.	Supported	Supported
<b>Appending objects</b>	You can call the AppendObject API to write additional data to an appendable object in a specified bucket. Objects created by calling the AppendObject API are appendable, while those created by calling the PutObject API are normal ones.	Not supported	Supported
<b>Customizing metadata</b>	You can add, modify, or delete metadata of uploaded objects.	Supported	Supported
<b>Bucket storage quota</b>	You can set the bucket space quota to limit the maximum amount of data that can be stored in a bucket. The maximum value is $2^{63}-1$ , in bytes. By default, the quota of a newly created bucket is not limited.	Supported	Supported
<b>Direct reading</b>	With direct reading enabled, you can download objects in the Archive storage class without restoring them in advance. Direct reading is a billable function.	Not supported	Supported
<b>Object sharing</b>	You can share an object stored in OBS with all users by using a temporary URL. All shared URLs are valid for only the specified period of time.	Supported	Supported



Function	Description	OBS 2.0	OBS 3.0
<b>Fragment management</b>	You can clear fragments that are generated during multipart uploads to save storage space in a bucket.	Supported	Supported
<b>Bucket encryption</b>	You can enable default encryption for a bucket when creating it. Then all objects uploaded to this bucket later will be automatically encrypted.	Not supported	Supported
<b>IAM agency</b>	You can create an IAM agency to authorize other cloud services or Huawei Cloud accounts to manage your OBS resources.	Not supported	Supported
<b>Monitoring</b>	You can monitor the traffic statistics and requests of buckets on OBS Console and Cloud Eye, so that you are able to properly use your buckets.	Supported	Supported
<b>Audit</b>	CTS keeps track of operations on buckets and objects in OBS. You can query the records from CTS for security analysis, compliance audit, resource tracking, and fault locating.	Supported	Supported
<b>API</b>	OBS provides REST APIs that support HTTP and HTTPS. You can call these APIs to create, modify, and delete buckets, as well as to upload, download, or delete objects.	Supported	Supported

# 5 Permissions Management

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You can use Identity and Access Management (IAM) to manage OBS permissions and control access to your resources. IAM provides identity authentication, permissions management, and access control.

You can create IAM users for your employees, and assign permissions to these users on a principle of least privilege (PoLP) basis to control their access to specific resource types. For example, you can create IAM users for software developers and assign specific permissions to allow them to use OBS resources but prevent them from being able to delete resources or perform any high-risk operations.

If your Huawei Cloud account does not require individual IAM users for permissions management, skip this section.

IAM is offered for free. You pay only for the resources in your account. For more information about IAM, see [What Is IAM?](#)

## OBS Permissions

By default, new IAM users do not have any permissions assigned. You can assign permissions to these users by adding them to one or more groups and attaching policies or roles to the groups.

OBS is a global service deployed and accessed without specifying any physical region. OBS permissions are assigned to users in the global project, and users do not need to switch regions when accessing OBS.

You can grant users permissions by using roles or policies.

- **Roles:** A type of coarse-grained authorization mechanism that provides only a limited number of service-level roles. When using roles to grant permissions, you also need to assign dependency roles. However, roles are not an ideal choice for fine-grained authorization and secure access control.
- **Policies:** A type of fine-grained authorization mechanism that defines permissions required to perform operations on specific cloud resources under certain conditions. This mechanism allows for more flexible policy-based authorization for secure access control. For example, you can grant OBS users only the permissions for managing a certain type of OBS resources. Most policies define permissions based on APIs. For the API actions supported by OBS, see [Permissions and Supported Actions](#).

 NOTE

Due to data caching, a role and policy involving OBS actions will take effect 10 to 15 minutes after it is attached to a user and a user group.

**Table 5-1** lists all system permissions of OBS.

**Table 5-1** OBS system permissions

Role/Policy Name	Description	Type	Dependency
Tenant Administrator	Allows you to perform all operations on all services except IAM.	System-defined role	None
Tenant Guest	Allows you to perform read-only operations on all services except IAM.	System-defined role	None
OBS Administrator	Allows you to perform any operation on all OBS resources under the account.	System-defined policy	None
OBS Buckets Viewer	Allows you to list buckets, and obtain basic bucket information and bucket metadata.	System-defined role	None
OBS ReadOnlyAccess	Allows you to list buckets, obtain basic bucket information and bucket metadata, and list objects (excluding versioned objects). <b>NOTE</b> If a user with this permission fails to list objects on OBS Console, there may be multiple versions of objects in the bucket. In this case, you need to grant the user the <b>obs:bucket:ListBucketVersions</b> permission so that the user can view different versions of objects on OBS Console.	System-defined policy	None
OBS OperateAccess	Allows you to perform all operations defined in OBS ReadOnlyAccess and to perform basic object operations, such as uploading objects, downloading objects, deleting objects, and obtaining object ACLs. <b>NOTE</b> If a user with this permission fails to list objects on OBS Console, there may be multiple versions of objects in the bucket. In this case, you need to grant the user the <b>obs:bucket:ListBucketVersions</b> permission so that the user can view different versions of objects on OBS Console.	System-defined policy	None

**Table 5-2** lists the common operations supported by each system-defined policy or role of OBS. Select the policies or roles as required.

**Table 5-2** Permissions and the allowed operations on OBS resources

Operation	Tenant Administrator	Tenant Guest	OBS Administrator	OBS Buckets Viewer	OBS ReadOnlyAccess	OBS Operate Access
Listing buckets	Yes	Yes	Yes	Yes	Yes	Yes
Creating buckets	Yes	No	Yes	No	No	No
Deleting buckets	Yes	No	Yes	No	No	No
Obtaining basic bucket information	Yes	Yes	Yes	Yes	Yes	Yes
Controlling bucket access	Yes	No	Yes	No	No	No
Managing bucket policies	Yes	No	Yes	No	No	No
Modifying bucket storage classes	Yes	No	Yes	No	No	No
Listing objects	Yes	Yes	Yes	No	Yes	Yes
Listing objects with multiple versions	Yes	Yes	Yes	No	No	No
Uploading files	Yes	No	Yes	No	No	Yes
Creating folders	Yes	No	Yes	No	No	Yes
Deleting files	Yes	No	Yes	No	No	Yes

Operation	Tenant Administrator	Tenant Guest	OBS Administrator	OBS Buckets Viewer	OBS ReadOnlyAccess	OBS Operate Access
Deleting folders	Yes	No	Yes	No	No	Yes
Downloading files	Yes	Yes	Yes	No	No	Yes
Deleting files with multiple versions	Yes	No	Yes	No	No	Yes
Downloading files with multiple versions	Yes	Yes	Yes	No	No	Yes
Modifying object storage classes	Yes	No	Yes	No	No	No
Restoring files	Yes	No	Yes	No	No	No
Canceling the deletion of files	Yes	No	Yes	No	No	Yes
Deleting fragments	Yes	No	Yes	No	No	Yes
Controlling object access	Yes	No	Yes	No	No	No
Configuring object metadata	Yes	No	Yes	No	No	No
Obtaining object metadata	Yes	Yes	Yes	No	No	Yes
Managing versioning	Yes	No	Yes	No	No	No

Operation	Tenant Administrator	Tenant Guest	OBS Administrator	OBS Buckets Viewer	OBS ReadOnlyAccess	OBS Operate Access
Managing logging	Yes	No	Yes	No	No	No
Managing tags	Yes	No	Yes	No	No	No
Managing lifecycle rules	Yes	No	Yes	No	No	No
Managing static website hosting	Yes	No	Yes	No	No	No
Managing CORS rules	Yes	No	Yes	No	No	No
Managing URL validation	Yes	No	Yes	No	No	No
Managing domain names	Yes	No	Yes	No	No	No
Appending objects	Yes	No	Yes	No	No	Yes
Configuring object ACL	Yes	No	Yes	No	No	No
Configuring the ACL for an object of a specified version	Yes	No	Yes	No	No	No
Obtaining object ACL information	Yes	Yes	Yes	No	No	Yes

Operation	Tenant Administrator	Tenant Guest	OBS Administrator	OBS Buckets Viewer	OBS ReadOnlyAccess	OBS Operate Access
Obtaining the ACL information of a specified object version	Yes	Yes	Yes	No	No	Yes
Uploading in the multipart mode	Yes	No	Yes	No	No	Yes
Listing uploaded parts	Yes	Yes	Yes	No	No	Yes
Canceling multipart uploads	Yes	No	Yes	No	No	Yes

## Managing OBS Resource Permissions

Access to OBS buckets and objects can be controlled by IAM user permissions, bucket policies, and ACLs.

For more information, see [OBS Permission Control](#).

## References

- [What Is IAM?](#)
- [IAM Basic Concepts](#)
- [Creating a User and Granting OBS Permissions](#)
- [IAM Policies and Supported Actions](#)

# 6 Restrictions and Limitations

This section describes the restrictions on using OBS features.

**Table 6-1** OBS use restrictions and limitations

Item	Description
Bandwidth	By default, the maximum bandwidth for read/write (GET/PUT) requests of a single Huawei Cloud account is 16 Gbit/s. If the actual bandwidth reaches the threshold, flow control will be triggered.
Queries per second (QPS)	<p>Default maximum QPS allowed by a single Huawei Cloud account:</p> <ul style="list-style-type: none"><li>• 6,000 write requests (PUT Object) per second</li><li>• 10,000 read requests (GET Object) per second</li><li>• 1,000 listing requests (LIST) per second</li></ul> <p><b>NOTE</b></p> <p>If you use sequential prefixes (such as timestamps or alphabetical order) for object naming, object access requests may be concentrated in a specific partition, resulting in access hotspots. This limits the request rate in a hotspot partition and increases access delay.</p> <p>Random prefixes are recommended for naming objects so that requests are evenly distributed across partitions, achieving horizontal expansion. For details about how to name objects with random prefixes, see <a href="#">Optimizing the Performance</a>.</p>



Item	Description
Resource packages	<ul style="list-style-type: none"><li>• A resource package can be used only in the specified region and cannot be shared across regions. So select an appropriate region when purchasing a resource package.</li><li>• OBS provides resource packages only for some billing items. For other billing items, the pay-per-use billing mode applies. For details, see <a href="#">Resource Package Overview</a>.</li><li>• Any resource usage beyond your package quotas in the current month is billed in the pay-per-use mode. A newly purchased resource package cannot cover the already generated resource usage.</li><li>• A storage package must match your bucket's data redundancy policy (single-AZ storage or multi-AZ storage) and storage class (Standard, Infrequent Access, Archive). Otherwise, the pay-per-use billing applies.</li><li>• Your Standard storage, Archive storage, and Internet outbound traffic packages can cover the fees incurred by both your parallel file systems and buckets. The pull traffic and cross-region replication traffic packages are currently not available for parallel file systems.</li></ul>
Access rules	<p>In consideration of the DNS resolution performance and reliability, OBS requires that the bucket name must precede the domain when a request carrying a bucket name is constructed to form a three-level domain name, also mentioned as virtual hosting access domain name.</p> <p>For example, you have a bucket named <b>test-bucket</b> in the <b>eu-west-101</b> region, and you want to access the ACL of an object named <b>test-object</b> in the bucket. The correct URL is <b><a href="https://test-bucket.obs.eu-west-101.myhuaweicloud.eu/test-object?acl">https://test-bucket.obs.eu-west-101.myhuaweicloud.eu/test-object?acl</a></b>.</p>

Item	Description
Buckets	<ul style="list-style-type: none"><li>• On OBS, each bucket name must be unique and cannot be changed.</li><li>• After you create a bucket, its name and region cannot be changed.</li><li>• An account (including all IAM users under this account) can create a maximum of 100 buckets and parallel file systems. 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 for storing objects with different prefixes and use <b>fine-grained permission control</b> to implement permission isolation between departments.</li><li>• By default, there is no limit on the storage capacity of the entire OBS system or a single bucket, and any number of objects can be stored.</li><li>• A bucket can be deleted only after all objects in the bucket have been deleted.</li><li>• The name of a deleted bucket can be reused for another bucket or a parallel file system at least 30 minutes after the deletion.</li></ul>

Item	Description
Uploading objects	<ul style="list-style-type: none"><li>● OBS Console has restrictions on the size and number of files uploaded.<ul style="list-style-type: none"><li>– In regions where batch upload is supported, a maximum of 100 files can be uploaded at a time, with a maximum total size of 5 GB. If you upload only one file in a batch upload, it cannot exceed 5 GB in size.</li><li>– In regions where batch upload is not supported, only one file can be uploaded at a time, with a maximum size of 50 MB.</li></ul></li><li>● If you use OBS Browser+, obsutil, an SDK, or an API, you can upload a single object of up to 48.8 TB.</li><li>● Batch upload is available only when:</li><li>● If versioning is disabled for your bucket and you upload a new file with the same name as the one you previously uploaded to your bucket, the new file automatically overwrites the previous file and does not retain its ACL information. If you upload a new folder using the same name that was used with a previous folder in the bucket, the two folders will be merged, and files in the new folder will overwrite namesake files in the previous folder.</li><li>● After versioning is enabled for your bucket, if the new file you upload has the same name as the one you previously uploaded to the bucket, a new file version will be added in the bucket.</li><li>● Though any UTF-8 characters can be used in object keys (object names), it is recommended that object keys be named according to the <a href="#">object key naming guidelines</a>. These guidelines help object key names substantially meet the requirements of DNS, web security characters, XML analyzers, and other APIs.</li></ul>
Bucket policies	There is no limit on the number of bucket policies (statements) for a bucket, but the total size of JSON descriptions of all bucket policies in a bucket cannot exceed 20 KB.
ACLs	<ul style="list-style-type: none"><li>● A bucket ACL can have up to 100 grants. The total bucket ACL size cannot exceed 50 KB.</li><li>● An object ACL can have up to 100 grants. The total object ACL size cannot exceed 50 KB.</li></ul>
Lifecycle management	There is no limit on the number of lifecycle rules in a bucket, but the total size of XML descriptions about all lifecycle rules in a bucket cannot exceed 20 KB.

Item	Description
Restoring Archive objects	<ul style="list-style-type: none"><li>• You cannot suspend or delete the restore task if an Archive object is being restored.</li><li>• You cannot restore an object in the <b>Restoring</b> state.</li><li>• 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. During the copy retention period, you will be billed for the storage space occupied by both the object and its copy. The Standard object copy will be automatically deleted upon its expiration.</li></ul>
Deleting objects	If versioning is not enabled for a bucket, deleted objects cannot be recovered.
Parallel File System	See the <a href="#">Parallel File System Feature Guide</a> .
User-defined domain name binding	<ul style="list-style-type: none"><li>• Only buckets in version 3.0 support user-defined domain name binding.</li><li>• By default, a maximum of 20 user-defined domain names can be bound to a bucket. In some regions (for example, CN South-Guangzhou), a bucket can have up to 30 user-defined domain names bound. For the maximum number allowed in each region, see the requirements on OBS Console.</li><li>• Currently, user domain names bound to OBS only allow access requests over HTTP. If you want to use a bound user domain name to access OBS over HTTPS, you need to enable CDN to manage HTTPS certificates.</li><li>• A user-defined domain name can be bound to only one bucket.</li><li>• Currently, the suffix of a user-defined domain name can contain 2 to 6 uppercase or lowercase letters.</li></ul>
Bucket inventories	See <a href="#">Bucket Inventory Overview</a> .

# 7 Basic Concepts

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## 7.1 Objects

Objects are basic units stored in OBS. An object contains both data and the metadata that describes data attributes. Data uploaded to OBS is stored in buckets as objects.

An object consists of the following:

- A key that specifies the name of an object. An object key is a UTF-8 string up to 1,024 characters long. Each object is uniquely identified by a key within a bucket.
- Metadata that describes an object. The metadata is a set of key-value pairs that are assigned to objects stored in OBS. There are two types of metadata:
  - System-defined metadata is automatically assigned by OBS for processing objects. Such metadata includes Date, Content-Length, Last-Modified, ETag, and more.
  - You can specify custom metadata to describe the object when you upload an object to OBS.
- Data that refers to the content of an 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 (/) to an object name, for example, **test/123.jpg**, you can specify **test** as a folder and **123.jpg** as the name of a file in the **test** folder. The key of the object is **test/123.jpg**.

When uploading an object, you can set a storage class for the object. If no storage class is specified, the object is stored in the same storage class as the bucket in which it resides. You can also change the storage class of an existing object in a bucket.

On OBS Console and OBS Browser+, you can use folders the same way you use them in a file system.

For details about object operations, see [Managing Objects](#).

## 7.2 Buckets

Buckets are containers for storing objects. OBS provides flat storage in the form of buckets and objects. Unlike the conventional multi-layer directory structure of file systems, all objects in a bucket are stored at the same logical layer.

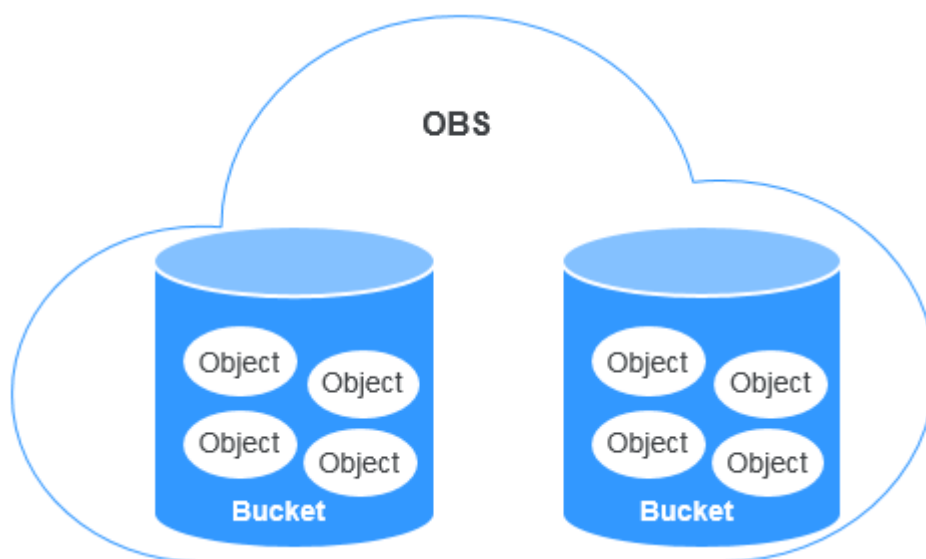
Each bucket has its own attributes, such as access permissions, storage class, and the region. You can specify access permissions, storage class, and regions when creating buckets. You can also configure advanced attributes to meet storage requirements in different scenarios.

Each bucket name in OBS is globally unique and cannot be changed after the bucket has been created. 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 users permissions (such as read and write permissions) on the bucket. Only authorized users can perform operations such as creating, deleting, viewing, and configuring buckets.

OBS adopts the REST architectural style, and is based on HTTP and HTTPS. You can use URLs to locate resources.

**Figure 7-1** illustrates the relationship between buckets and objects in OBS.

**Figure 7-1** Relationship between objects and buckets



For details about bucket operations, see [Managing Buckets](#).

## 7.3 Parallel File System

Parallel File System (PFS), a sub-product of OBS, is a high-performance file system, with access latency in milliseconds. PFS can support a bandwidth performance up to the TB/s level and supports millions of IOPS, which makes it ideal for processing high-performance computing (HPC) workloads.

It also supports data read and write through obsfs, a PFS client that supports POSIX. obsfs can be deployed on a Linux ECS, and then you can use obsfs to mount a parallel file system to that server. Once mounted, PFS functions like a local file system. You can manage the PFS online, including creating, deleting, renaming files and folders, or modifying files.

For details about PFS, see the [Parallel File System Feature Guide](#).

## 7.4 Access Keys (AK/SK)

OBS uses an access key ID (AK) and secret access key (SK) to authenticate the identity of a requester. When you use OBS APIs for secondary development and use the AK and SK for authentication, the signature must be calculated based on the algorithm defined by OBS and added to the request.

The authentication can be based on a permanent AK and SK pair, or based on a temporary AK/SK pair and security token.

### Permanent AK/SK Pair

You can create a pair of permanent AK and SK on the **My Credentials** page. For details, see [Obtaining Access Keys \(AK and SK\)](#).

- Access key ID (AK): indicates the ID of the access key. It is the unique ID associated with the SK. The AK and SK are used together to obtain an encrypted signature for a request.
- Secret access key (SK): indicates the private key used together with its associated AK to cryptographically sign requests. The AK and SK are used together to identify a request sender to prevent the request from being modified.

### Temporary AK/SK Pair

A temporary AK/SK pair and security token assigned by OBS comply with the principle of least privilege and are for temporarily accessing OBS. They are valid from 15 minutes to 24 hours, and need to be obtained again once they expire. If the security token is missing from your request, a 403 error will be returned.

- Temporary AK: indicates the ID of a temporary access key. It is the unique ID associated with the SK. The AK and SK are used together to obtain an encrypted signature for a request.
- Temporary SK: indicates the temporary private key used together with its associated temporary AK. The AK and SK are used together to identify a request sender to prevent the request from being modified.
- Security token: indicates the token used together with the temporary AK and SK to access all resources of a specified account.

When using the following tools to access OBS resources, you need to use the AK/SK pair for security authentication.

**Table 7-1** OBS resource management tools

Tool	AK/SK Configuration
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## References

For details about how to obtain a permanent AK/SK pair, see [Obtaining Access Keys \(AK and SK\)](#).

For details about how to obtain a temporary AK/SK pair and security token, see [Obtaining Temporary AK/SK](#).

## 7.5 Endpoints and Domain Names

**Endpoint:** OBS provides an endpoint for each region. An endpoint is considered a domain name to access OBS in a region and is used to process requests of that region. For details about regions and endpoints, see .

**Bucket domain name:** Each bucket in OBS has a domain name. A domain name is the address of a bucket and can be used to access the bucket. It is applicable to cloud application development and data sharing.

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

**Table 7-2** lists the bucket domain name and other domain names in OBS, including their structure and protocols.

**Table 7-2** OBS domain names

Type	Structure	Description	Protocol
Regional domain name	[Structure] <b>Endpoint</b> [Example] obs.eu-west-101.myhuaweicloud.eu	Each region has an endpoint, which is the domain name of the region.	HTTPS HTTP
Bucket domain name	[Structure] <b>BucketName.Endpoint</b> [Example] bucketname.obs.eu-west-101.myhuaweicloud.eu	After a bucket is created, you can use the domain name to access the bucket. You can compose the domain name according to the structure of bucket domain names, or you can obtain it from basic information of the bucket on OBS Console or OBS Browser+.	HTTPS HTTP



Type	Structure	Description	Protocol
Object domain name	[Structure] <b>BucketName.Endpoint/ ObjectName</b> [Example] bucketname.obs.eu-west-101.myhuaweicloud.eu/object.txt	After an object is uploaded to a bucket, you can use the object domain name to access the object. You can spell out the domain name according to the structure of object domain names, or you can obtain it from the object details on OBS Console or OBS Browser+. Alternatively, you can call the GetObjectUrl API through the SDK to obtain the object domain name.	HTTP PS HTTP
Static website domain name	[Structure] <b>BucketName.obs-website.Endpoint</b> [Example] bucketname.obs-website.eu-west-101.myhuaweicloud.eu	A static website domain name is a bucket domain name when the bucket is configured to host a static website.	HTTP PS HTTP
User-defined domain name	Self-owned domain name registered with a domain name provider	You can bind a user domain name to a bucket so that you can access the bucket through the user domain name.	HTTP

## 7.6 Region and AZ

### Concept

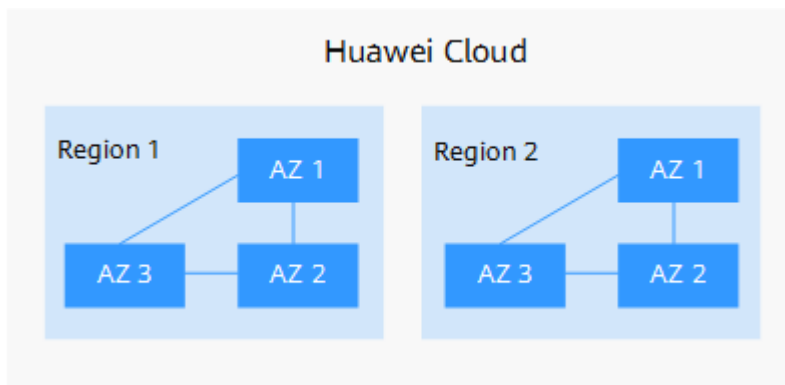
A region and availability zone (AZ) identify the location of a data center. You can create resources in a specific region and AZ.

- Regions are classified based on geographical location and network latency. Public services, such as Elastic Cloud Server (ECS), Elastic Volume Service (EVS), Object Storage Service (OBS), Virtual Private Cloud (VPC), Elastic IP (EIP), and Image Management Service (IMS), are shared within the same region. Regions are classified as universal regions and dedicated regions. A universal region provides universal cloud services for common tenants. A dedicated region provides services of the same type or only provides services for specific tenants.
- An AZ contains one or more physical data centers. Each AZ has independent cooling, fire extinguishing, moisture-proofing, and electricity facilities. Within

an AZ, computing, network, storage, and other resources are logically divided into multiple clusters. AZs within a region are interconnected using high-speed optical fibers to allow you to build cross-AZ high-availability systems.

**Figure 7-2** shows the relationship between the regions and AZs.

**Figure 7-2** Regions and AZs



## How to Select a Region?

When selecting a region, consider the following factors:

- Location  
Select a region close to you or your target users. This reduces network latency and improves access speed. However, Chinese mainland regions provide the same infrastructure, BGP network quality, as well as resource operations and configurations. If you or your target users are in the Chinese mainland, you do not need to consider the network latency differences when selecting a region.
  - If you or your target users are in the Asia Pacific area (excluding the Chinese mainland), select regions such as **AP-Bangkok** or **AP-Singapore**.
  - If you or your target users are in Africa, select the **AF-Johannesburg** region.
  - If you or your target users are in Europe, select the **EU-Paris** or **EU-Amsterdam-OP1** region.
- Resource prices  
Resource prices may vary depending on different regions.

## How Do I Select an AZ?

When determining whether to deploy resources in the same AZ, consider your applications' requirements for disaster recovery (DR) and network latency.

- For high DR capability, deploy resources in different AZs in the same region.
- For low network latency, deploy resources in the same AZ.

## Regions and Endpoints

Before using an API to call resources, you must specify its region and endpoint. For details about Huawei Cloud regions and endpoints, see .

# 8 Change History

Release Date	What's New
2023-07-31	This is the fourth official release. This issue incorporates the following change: <ul style="list-style-type: none"><li>• Added the content related to object sharing.</li></ul>
2023-06-07	This is the third official release. This issue incorporates the following change: <ul style="list-style-type: none"><li>• Added the content of direct reading.</li></ul>
2023-03-20	This is the second official release. This issue incorporates the following change: <ul style="list-style-type: none"><li>• Added the content about bucket inventories.</li></ul>
2022-09-30	This is the first official release.