Live

Service Overview

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Contents

1 What Is Live?

Huawei Cloud Live is the cumulation of years of video expertise. It offers a secure and high-concurrency E2E livestreaming solution while delivering a low-latency HD experience. Live offers the following subproducts:

- **Cloud Live**
- **Media Live**

Cloud Live

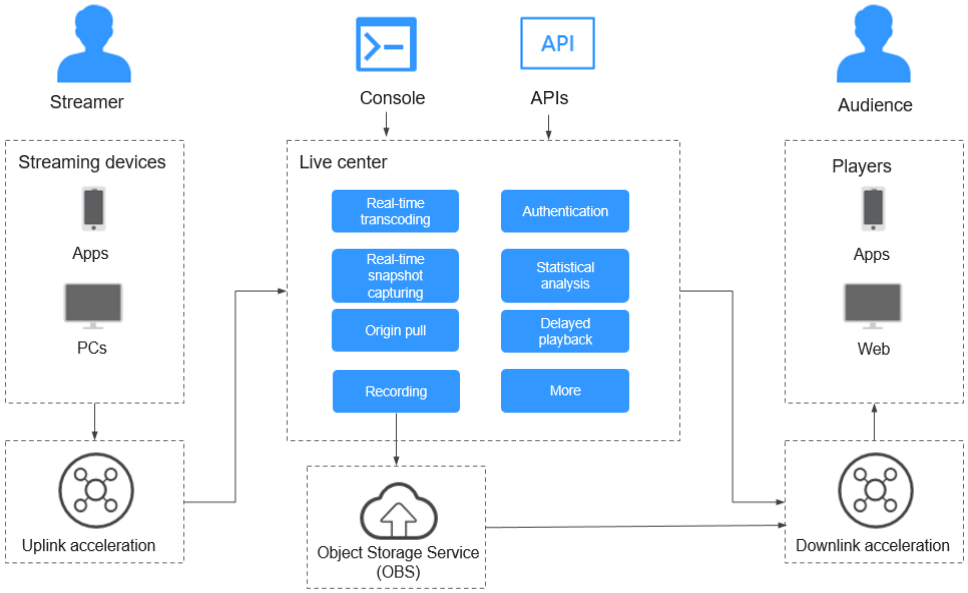
Cloud Live is an easy-to-use livestreaming service. It provides diverse live acceleration capabilities for entertainment, e-commerce, and education scenarios.

Huawei Cloud Live provides Cloud Stream Live and Low Latency Live (LLL). **Table 1-1** describes their differences.

- **Cloud Stream Live** improves the stability and efficiency of high-concurrency livestreaming and provides powerful real-time media processing capabilities. **Figure 1-1** shows the architecture of Cloud Stream Live.

  By default, it is billed by downlink playback traffic. Available billing options include traffic volume, daily peak bandwidth, and 95th percentile bandwidth. For details, see **Billing**.

Figure 1-1 Cloud Stream Live architecture



Process of livestreaming:

a. A streaming tool is used to push a livestream to an origin server with uplink acceleration enabled.

b. The origin server transcodes the livestream in real time.

c. The processed livestream is distributed to viewers with downlink acceleration enabled.

d. Live records the livestream to Object Storage Service (OBS).

- **Low Latency Live** can minimize latency and frame freezing in high-concurrency scenarios. With optimized transmission protocols, dynamic routing, and low-latency transcoding, LLL keeps the latency under milliseconds to help you deliver premium content even under poor network conditions. It is suitable for scenarios that require low latency and good content synchronization. **Figure 1-2** shows the LLL architecture.

  A multi-terminal demo is provided for you to try out LLL. To obtain the app demo and source code, **submit a service ticket** to contact Huawei Cloud technical engineers.

Figure 1-2 LLL architecture

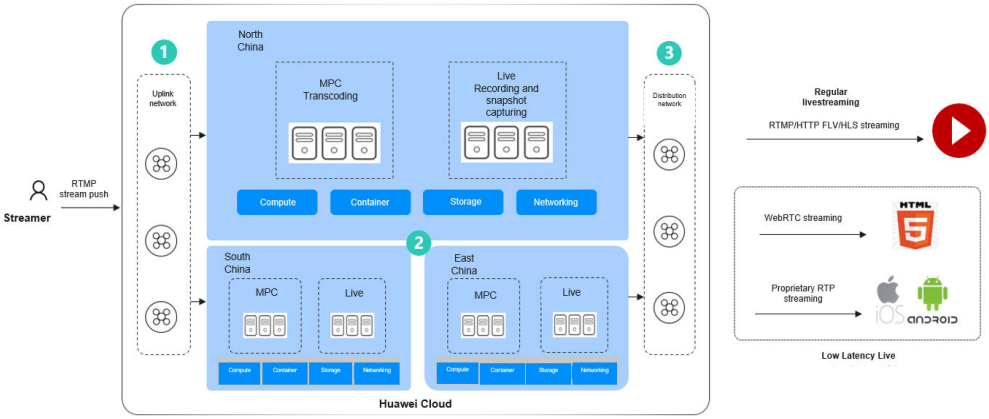


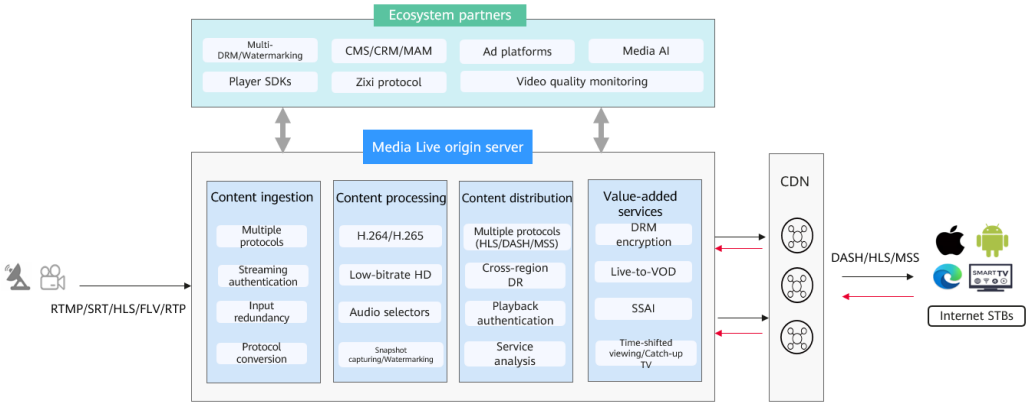
Table 1-1 Comparison of Cloud Live sub-scenarios

Cloud Live Sub-Scenario	Cloud Stream Live	LLL
Streaming Protocol	RTMP, HTTP-FLV, and HLS	WebRTC
E2E Latency	RTMP and HTTP-FLV latency > 3s HLS latency > 6s	E2E latency < 800 ms
Adaptable Network	Average	Good
Application Scenario	Livestreaming that is insensitive to latency	Interactive livestreaming that requires low latency and good image synchronization
General Capability	• Functions such as real-time transcoding, recording, real-time snapshot capturing, content encryption, authentication, and statistics analysis • More than 2800 acceleration nodes in China and more than 800 outside China to provide superlative service experience	

Media Live

Huawei Cloud Media Live ensures stable broadcast-grade streaming for the industry's leading PGC players, around the clock with zero interruptions. Powered by the abundant compute resources of Huawei Cloud AZs worldwide and Huawei's years of audio/video expertise, Media Live helps TV stations and OTT platforms confidently deliver media content to their global audiences with unparalleled clarity and performance.

Figure 1-3 Media Live architecture



2 Product Advantages

2.1 Cloud Live

Advantages of Cloud Live:

- **Cloud Stream Live**
- **LLL**

Cloud Stream Live

Livestreaming acceleration: RTMP stream push and RTMP/HTTP-FLV/HLS stream pull are supported. With intelligent scheduling, streams can be pushed to the site nearby, delivering a frame freezing rate lower than 2.5%. A playback success rate of more than 99.9% ensures instant video playback.

Low-bitrate HD: Lower bitrate at a given image quality reduces bandwidth costs by 20–30%.

High cost-effectiveness: H.264/265 transcoding improves livestreaming experience and greatly reduces costs.

Enhanced security & reliability: Cross-region DR and 24/7 technical support safeguard your business. The livestreaming architecture is built on Huawei's 20 years of Cloud Native 2.0 experience. It is an agile and intelligent architecture that combines enhanced security and reliability with fast scaling to safeguard your livestreaming.

LLL

Millisecond-level latency: UDP is used to livestream within milliseconds in high-concurrency scenarios, which outperforms regular livestreaming that suffers from a latency of 3–5 seconds. In addition, core metrics such as first-frame latency and frame freezing rate are improved, minimizing livestreaming latency for viewers.

Comprehensive functions and high compatibility: LLL supports major functions of Cloud Stream Live, such as stream push, live transcoding, recording, snapshot capturing, and playback. You can easily migrate your workloads from Cloud Stream Live to LLL.

Easy usage and enhanced security: Using standard protocols allows playing video on Chrome and Safari with no need for plug-ins. Protocols are encrypted by default, which are secure and reliable.

2.2 Media Live

Global Acceleration and Nearby Access

- 800+ nodes outside the Chinese mainland, covering 130+ countries and regions
- 180 Tbit/s+ bandwidth reserve for elastic scaling upon traffic bursts
- Faster, stable access for users across regions and networks

Industry-leading Proprietary Technology

- Intelligent routing helps identify the optimal route based on factors such as access location and network quality, delivering content 20%+ faster.
- Proprietary software-hardware synergy improves service performance.

Secure Transmission

- Full-link HTTPS transmission and advanced security control ensure stable service running and data security.
- Automatic node failover offers high service availability.
- The 24/7 local expert service responds to your needs in a timely manner.

Lower Costs and Higher Efficiency

- Lower operations costs and latency and less retrieval bandwidth usage
- Easy configuration in just a few steps and more efficient deployment

3 Scenarios

The following lists application scenarios of Live subproducts:

- Cloud Live
  - **Cloud Stream Live**
  - **LLL**
- **Media Live**

Cloud Stream Live

Online education: Cloud Stream Live is an easy-to-integrate cloud service that can guarantee low-latency HD even when there are a massive number of viewers. Powerful real-time media processing ensures that videos can be quickly sent to interactive education websites. The acceleration nodes networkwide allow students to watch smooth videos. With video recording and transcoding, students can review learning materials at any time. In addition, hotlink protection prevents teaching materials from unauthorized use to protect copyrights.

Interactive entertainment: Cloud Stream Live can be used for livestreaming by influencers and enterprises, or livestreaming for entertainment and gaming. This one-stop E2E livestreaming solution supports diverse media processing functions, such as real-time transcoding.

Live commerce: Cloud Stream Live helps e-commerce platforms better present their products to turn more prospects into customers. The ultra-low latency keeps both streamers and viewers informed of transactions in real time so that viewers can buy products while watching the video.

Live events: Cloud Stream Live enables you to manage permissions for playing video using IP address access control lists (ACLs), URL validation, and the Advanced Encryption Standard (AES). These features help protect live content from unauthorized playback. Live video recording and recording file index creation are supported. Together with VOD, a one-stop Live-to-VOD solution is provided to facilitate the livestreaming of sports games, e-games, and enterprise presentations.

LLL

Large online courses: Millisecond-level latency facilitates interactivity in class, such as smoother Q&A sessions and whiteboard sharing, significantly improving student engagement and learning efficiency.

Live commerce: Low latency ensures a fair and consistent experience in live commerce activities such as flash sales. The streamer can answer viewers' questions and on-screen comments in a timely manner, attracting more visitors to the e-commerce platform for higher gross merchandise volume (GMV).

Fashion shows: The streamer can receive gifts sent by viewers immediately, improving interactivity in this latency-sensitive scenario.

Live sports: Fans can watch sports games together in a live room and interact with each other in real time at a low latency.

Media Live

Broadcast & TV: Huawei Cloud Media Live ensures 24/7 broadcast-grade streaming for broadcasters, TV stations, and carriers. With the CDN points of presence (PoPs) deployed worldwide, a higher compression rate for the same image quality improves user experience and inexpensively distributes live content.

Sports: By using local and global CDN PoPs, Media Live facilitates international livestreaming of major sports events, and offers premium live video experience in areas where these programs have a high viewership. SRT streams can be smoothly transmitted even in poor network conditions. Real-time packaging enables streams to play at different bitrate levels to ensure good video experience on multiple devices.

Entertainment: Powerful real-time transcoding allows streaming movies at a high level of bitrate and frame rate. DRM encryption and digital watermarking protect the copyright of high-value media content.

4 Functions

4.1 Cloud Live

This section describes the functions of Cloud Live. You can check if a certain function is available in a region on the console.

Stream Push

Stream push is the process of collecting, encoding, and packaging live content and then transmitting it to Huawei Cloud origin servers.

Stream push protocol: RTMP, audio-only, and video-only

Stream push method: using third-party software, such as Open Broadcaster Software (OBS), XSplit, and FMLE

Uplink acceleration: stream push acceleration, user access point/device scheduling (DNS or HTTP DNS), access control, and auto scaling for live video

Playback

Playback is the process of playing livestreams pushed from Huawei Cloud origin servers or from third-party origin servers.

Playback protocol: RTMP, HTTP-FLV, and HLS for Cloud Stream Live; WebRTC (can be downgraded to HTTP-FLV) for Low Latency Live (LLL)

Playback method: third-party players such as VLC for Cloud Stream Live; LLL online demos or open APIs for low-latency playback on web devices

Downlink acceleration: content distribution acceleration, user access point/device scheduling (DNS or HTTP DNS), access control, and auto scaling for live video

Transcoding

You can **transcode a livestream** into a video stream of different resolutions and bitrates to fit the network conditions. H.264/H.265 standard transcoding and low-bitrate HD transcoding are supported.

Stream Status Notifications

You can add a URL on the Live console for receiving messages when stream push starts or ends. A message is sent as a POST request to the user server through an HTTP API. Then the server returns the status code 200 to confirm that the message has been received. For details, see **Stream Status Notifications**.

Stream Delay

The stream delay of Live defaults to 2 seconds and can be changed to 4 or 6 seconds. You can **configure stream delay** for RTMP and HTTP-FLV streams. The group of pictures (GOP) duration of the ingest end cannot be longer than the configured delay. The actual delay is influenced by factors including the player's network conditions.

Note: This function is not recommended for LLL.

Origin Pull

By default, a streaming domain name created on Huawei Cloud Live pulls live content from Huawei origin servers. If you want to play live content pushed from your own origin server on Huawei Cloud, you can configure an origin address on the Live console to pull live content from your own origin server to a Huawei origin server for accelerated content distribution. For details, see **Configuring Origin Pull**.

Note: If you set **Origin Server** to **My origin server (domain name)** or **My origin server (IP address)** for a streaming domain name, livestreams of the ingest domain name associated with this streaming domain name cannot be played, and functions such as transcoding cannot be used. For LLL, ensure that there is no B-frame for origin pull.

HTTPS Secure Acceleration

Live allows you to configure **HTTPS secure acceleration** for streaming domain names. You can configure your own certificates or certificates purchased from Huawei Cloud Certificate & Manager (CCM) on the Live console. Only certificates in PEM format are supported. You can also enable **Force HTTPS** to force redirect user requests to HTTPS.

Access Control

Live provides referer validation, URL validation, and access control lists (ACLs) to identify and filter out malicious visitors. Only authenticated visitors can use Live.

URL validation protects origin server resources from unauthorized download and theft. Referer validation uses referer blacklists/whitelists to prevent hotlinking. However, referer validation cannot well protect origin server resources because the referer content can be forged. As a result, you are advised to use URL validation.

Authentication mechanism of Live:

URL validation: Both ingest and streaming URLs can be validated. You can customize the authentication key and expiration time and use multiple authentication algorithms provided by Live.

Referer validation: You can configure a referer blacklist or whitelist to identify and filter out malicious visitors.

ACL: You can configure an IP address blacklist or whitelist to identify and filter out malicious visitors.

Usage Statistics

With **usage statistics**, you can view the downstream bandwidth/traffic of all streaming domain names, and the total transcoding duration, maximum number of concurrent recording streams, and number of snapshots of all ingest domain names.

Service Monitoring

With **service monitoring**, you can view data of a streaming domain name, such as the downstream bandwidth/traffic, stream playback profile, response status codes, and the number of online viewers of the corresponding livestream. You can also view data of the ingest domain name, such as the upstream bandwidth/traffic, total number of streams, pushed stream details, and frame rate/bitrate of a pushed stream.

LLL Statistical Analysis

You can view the LLL-related statistics of a streaming domain name, including the downstream bandwidth/traffic and global and single-stream playback statistics. For details, see .

Log Management

Live provides the **log management** function that allows you to view detailed logs about the network users' access to all streaming domain names and download logs of the past 90 days.

Note: You can query and download logs in a time span of up to seven days. To query and download logs in a longer time span, repeat the operations.

Enterprise Project

Enterprise projects allow you to manage resource instances and services by category. Resources and services in different regions can be added to the same enterprise project. For example, an enterprise can classify resources based on departments or project groups and then put relevant resources into the same enterprise project for management. When **adding a domain name**, you can specify its enterprise project to facilitate domain name resource and permission management.

4.2 Media Live

This section describes the functions of Media Live. You can check if a certain function is available in a region on the console.

Multi-Protocol Primary/Standby Stream Input

Media Live supports multiple input protocols, including RTMP, SRT, HLS, and FLV. You can provide primary and standby input addresses for each stream to ensure stream stability and reliability. For details, see **Channel Management**.

High-Quality Transcoding

Media Live enables transcoding with versatile levels of resolution, bitrate, and frame rate. It supports H.264 and H.265, and enables standard and low-bitrate HD transcoding. By delivering the same image quality at lower bitrate, it effectively enhances user experience while reducing distribution costs. For details, see **Creating a Transcoding Template**.

Image Watermarking

You can add image watermarks to livestreams. For details, see **Media Processing**.

Real-Time Packaging of Multi-Protocol Livestreams

Livestreaming, catch-up TV, and time-shifted viewing are supported for HLS, DASH, and MSS output streams. Transcoding templates can be applied in real time to distribute content with adaptive bitrate. For details, see **Channel Management**.

Digital Rights Management (DRM)

FairPlay, Widevine, PlayReady, and Multi-DRM safeguard your high-value media assets. For details, see **Channel Management**.

Stream Quality Monitoring

Media Live supports minute-level input stream quality monitoring by channel.

You can view the monitoring information about **CDN Downstream Bandwidth/Traffic**, **CDN Status Codes** returned in responses, **CDN Concurrent Downstream Requests**, **Transcoding Metrics**, and **Packaging Metrics**. For details, see **Service Monitoring**.

Domain Name Management

You can add, delete, disable, and enable ingest domain names and streaming domain names. For details, see **Domain Name Management**.

Channel Management

You can create, enable, modify, disable, and delete a channel. For details, see **Channel Management**.

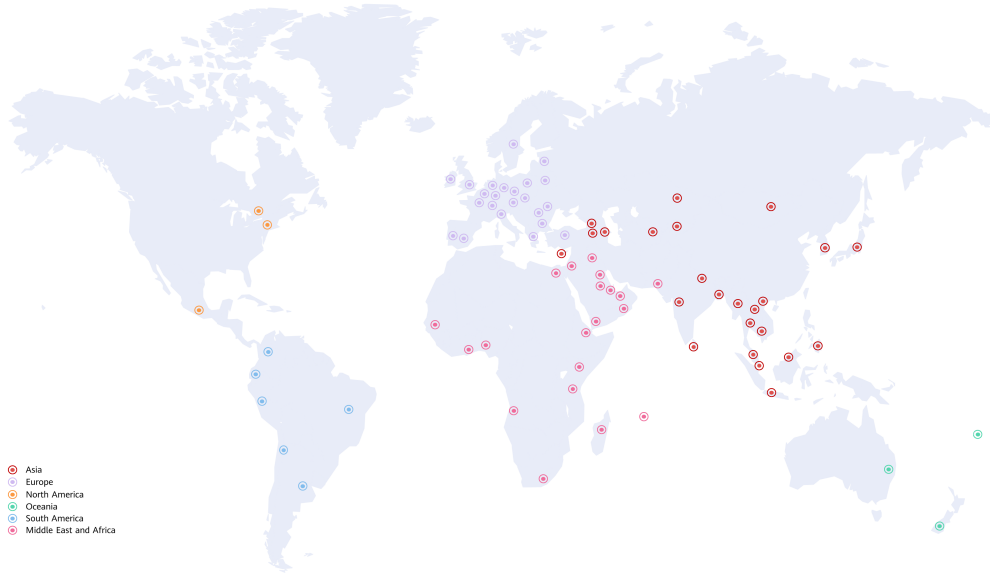
5 PoP Distribution

Huawei Cloud Live has over 2,000 PoPs across the globe. It covers more than 130 countries and regions and connects to networks of over 1,600 carriers. User requests can be scheduled to the most appropriate PoPs, accelerating content delivery.

NOTICE

For the region restrictions, see **Adding Domain Names**.

PoP Distribution Outside the Chinese Mainland



Geographic Region	PoP Distribution (Divided Based on Huawei's Internal Businesses)
Asia	Azerbaijan, Hong Kong (China), India, Indonesia, Japan, Kazakhstan, Macao (China), Malaysia, Philippines, Singapore, Thailand, and Vietnam
Europe	France, Germany, and United Kingdom
Middle East and Africa	Bahrain, Egypt, Iraq, Oman, Qatar, Saudi Arabia, South Africa, and United Arab Emirates
North America	Mexico
South America	Argentina, Brazil, Chile, Colombia, and Peru

6 Security

6.1 Shared Responsibilities on Huawei Cloud

Huawei guarantees that its commitment to cyber security will never be outweighed by the consideration of commercial interests. To cope with emerging cloud security challenges and pervasive cloud security threats and attacks, Huawei Cloud builds a comprehensive cloud service security assurance system for different regions and industries based on Huawei's unique software and hardware advantages, laws, regulations, industry standards, and security ecosystem.

Unlike traditional on-premises data centers, cloud computing separates operators from users. This approach not only enhances flexibility and control for users but also greatly reduces their operational workload. For this reason, cloud security cannot be fully ensured by one party. Cloud security requires joint efforts of Huawei Cloud and you, as shown in **Figure 6-1**.

- **Huawei Cloud**: Huawei Cloud is responsible for infrastructure security, including security and compliance, regardless of cloud service categories. The infrastructure consists of physical data centers, which house compute, storage, and network resources, virtualization platforms, and cloud services Huawei Cloud provides for you. In PaaS and SaaS scenarios, Huawei Cloud is responsible for security settings, vulnerability remediation, security controls, and detecting any intrusions into the network where your services or Huawei Cloud components are deployed.
- **Customer**: As our customer, your ownership of and control over your data assets will not be transferred under any cloud service category. Without your explicit authorization, Huawei Cloud will not use or monetize your data, but you are responsible for protecting your data and managing identities and access. This includes ensuring the legal compliance of your data on the cloud, using secure credentials (such as strong passwords and multi-factor authentication), and properly managing those credentials, as well as monitoring and managing content security, looking out for abnormal account behavior, and responding to it, when discovered, in a timely manner.

Figure 6-1 Huawei Cloud shared security responsibility model

Cloud security responsibilities are determined by control, visibility, and availability. When you migrate services to the cloud, assets, such as devices, hardware, software, media, VMs, OSs, and data, are controlled by both you and Huawei Cloud. This means that your responsibilities depend on the cloud services you select. As shown in **Figure 6-1**, customers can select different cloud service types (such as IaaS, PaaS, and SaaS) based on their service requirements. As control over components varies across different cloud service categories, the responsibilities are shared differently.

- In on-premises scenarios, customers have full control over assets such as hardware, software, and data, so tenants are responsible for the security of all components.
- In IaaS scenarios, customers have control over all components except the underlying infrastructure. So, customers are responsible for securing these components. This includes ensuring the legal compliance of the applications, maintaining development and design security, and managing vulnerability remediation, configuration security, and security controls for related components such as middleware, databases, and operating systems.
- In PaaS scenarios, customers are responsible for the applications they deploy, as well as the security settings and policies of the PaaS middleware, database, and network access under their control.
- In SaaS scenarios, customers have control over their content, accounts, and permissions. They need to protect their content, and properly configure and protect their accounts and permissions in compliance with laws and regulations.

On-premises (On-Prem): Software and IT infrastructure are deployed and managed by customers within their own data centers, rather than be deployed by remote cloud service providers.

Infrastructure as a Service (IaaS): Cloud service providers offer compute, network, storage, and more infrastructure services, including **Elastic Cloud Server (ECS)**, **Virtual Private Network (VPN)**, and **Object Storage Service (OBS)**.

Platform as a Service (PaaS): Cloud service providers deliver platforms required for application development and deployment, such as **ModelArts**. Customers do not need to maintain the underlying infrastructure.

Software as a Service (SaaS): Cloud service providers offer complete application software. Customers use the software directly without the need to install the application, maintain it, or manage its underlying platform or infrastructure.

6.2 Shared Responsibilities on Huawei Cloud Live

Live requires the participation and responsibility sharing of the following roles. The security responsibility boundary of each role is as follows:

- **Huawei Cloud tenant**

  Responsible for **livestreaming management**, including the following security responsibilities:

  - Application and data security of the livestreaming platform and apps
  - Security of livestreaming activities
  - End user (streamers or viewers) security management, including security supervision of live video content
  - Response to regulators

- **Huawei Cloud Live**

  The security responsibilities of **Live** are as follows:

  - Transmission network security, which is essential to the transmission and processing of video content
  - Tenant data security
  - Providing technologies, such as snapshot capturing and recording, to support tenants' video content monitoring
  - Response to regulators

- **End user**

  Streamers and viewers are responsible for the security of video production and video content.

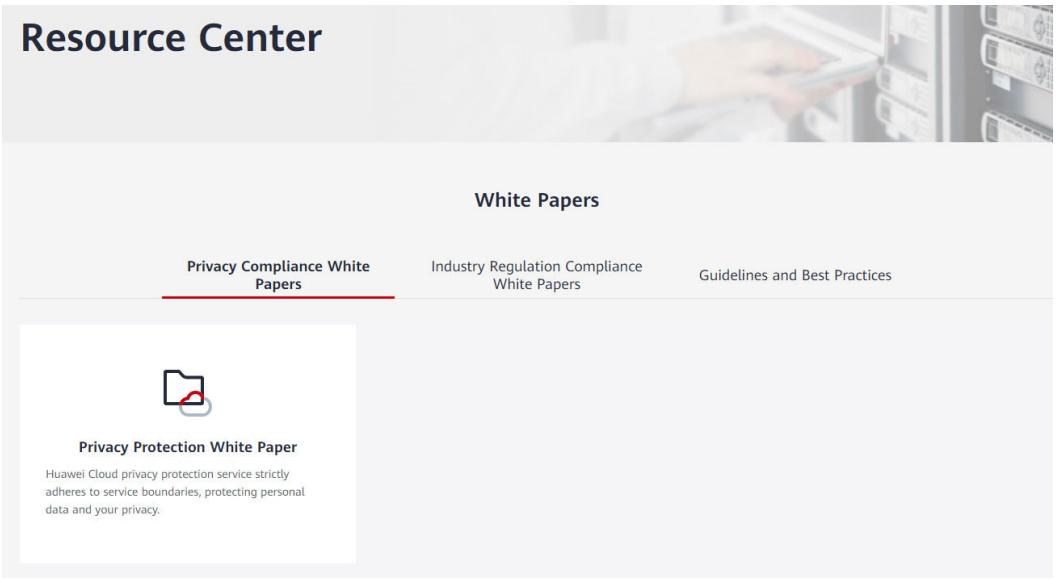
For details, see .

6.3 Certificates

Resource Center

Huawei Cloud also provides the following resources to help users meet compliance requirements. For details, see **Resource Center**.

Figure 6-2 Resource center



6.4 Identity Authentication and Access Control

6.4.1 Permissions Management

If you need to assign different permissions to employees in your enterprise to access your Live resources, Identity and Access Management (IAM) is a good choice for refined permissions management. IAM provides identity authentication, permissions management, and access control to ensure secure access to your Huawei Cloud resources.

With IAM, you can use your Huawei Cloud account to create IAM users, and assign permissions to the users to control their access to specific resources. For example, some software developers in your enterprise need to use Live but are not allowed to delete Live resources or perform any high-risk operations. To this end, you can create IAM users for the software developers and assign them only the permissions for using Live.

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

IAM is free. You pay only for the resources in your account.

Live Permissions

By default, new IAM users do not have any permissions. You need to add them to one or more groups, and then add permissions policies or roles to these groups. The users inherit permissions from their groups and can then perform specified operations on cloud services.

Live is a project-level service deployed in different physical regions. To assign permissions to a user group, specify the scope as region-specific projects and select projects for the permissions to take effect. If **All projects** is selected, the permissions will take effect for the user group in all region-specific projects. When

accessing Live, the users need to switch to a region where they have been authorized to use Live.

NOTE

When assigning permissions to a user group in IAM, you cannot select **Enterprise projects** when setting **Specify the authorization scope** on the **Select Scope** page.

You can assign users permissions by using roles and policies.

- Roles: A coarse-grained authorization mechanism provided by IAM to define permissions based on users' job responsibilities. This mechanism provides a limited number of service-level roles for authorization. If one role has a dependency role required for accessing Live, assign both roles to the users. However, roles are not an ideal choice for fine-grained authorization and secure access control.
- Policies: Policy-based permissions management is a type of fine-grained authorization mechanism that grants permissions for performing operations on specific cloud resources. This mechanism allows for more flexible policy-based authorization and meets secure access control requirements. For example, you can assign Live users the permissions for managing only a certain type of resources.

Table 6-1 lists all system-defined permissions on Live.

NOTICE

- If you use a custom policy but do not use the system-defined permissions **Live FullAccess** and **Live ReadOnlyAccess**, you need to add the operation permission **live:tenant:getTenantInformation** before accessing the Live console.
- After assigning an IAM user the **Live FullAccess** permission, you need to assign the user the following Cloud Eye permissions to monitor metrics of Live:
  - **CES ReadOnlyAccess**: On the Cloud Eye console, choose **Cloud Service Monitoring** > **Live** to view resource monitoring metrics of Live.
  - **CES FullAccess**: On the Cloud Eye console, choose **Cloud Service Monitoring** > **Live** to view resource monitoring metrics of Live and perform operations.

Table 6-1 System-defined permissions on Live

Name	Description	Category	Dependency
Live FullAccess	Has all permissions on Live.	System-defined policy	None
Live ReadOnlyAccess	Has the read-only permission on Live.	System-defined policy	None

Table 6-2 lists the common operations supported by each system-defined policy of Live. Select the policies as required.

Table 6-2 Common operations supported by each system-defined policy

Operation	Live FullAccess	Live ReadOnlyAccess
Creating a domain name	√	x
Modifying a domain name	√	x
Deleting a domain name	√	x
Querying domain names	√	√
Mapping domain names	√	x
Deleting a domain name mapping	√	x
Adding or overwriting stream notification configurations	√	x
Querying stream notification configurations	√	√
Deleting stream notification configurations	√	x
Creating a domain name configuration item	√	x
Modifying a domain name configuration item	√	x
Querying domain name configuration items	√	√
Deleting a domain name configuration item	√	x
Querying IP ACLs	√	√
Modifying an IP ACL	√	x
Obtaining the list of regions where Live is available	√	√

Operation	Live FullAccess	Live ReadOnlyAccess
Modifying the list of regions where Live is available	√	x
Configuring a referer validation ACL	√	x
Deleting a referer validation ACL	√	x
Querying referer validation ACLs	√	√
Querying HTTPS certificate information	√	√
Obtaining the link for downloading playback logs	√	√
Creating a recording template	√	x
Querying recording templates	√	√
Modifying a recording template	√	x
Deleting a recording template	√	x
Querying recording templates	√	√
Querying recorded content	√	√
Submitting a recording command	√	x
Creating a recording callback	√	x
Querying recording callbacks	√	√
Modifying a recording callback	√	x
Querying recording callbacks	√	√
Deleting a recording callback	√	x

Operation	Live FullAccess	Live ReadOnlyAccess
Configuring a snapshot capturing template	√	x
Modifying a snapshot capturing template	√	x
Querying snapshot capturing templates	√	√
Deleting a snapshot capturing template	√	x
Disabling a stream	√	x
Querying disabled streams	√	√
Resuming a stream	√	x
Modifying the attribute of a disabled stream	√	x
Disconnecting a stream	√	x
Querying ongoing streams	√	√
Creating a task for ingesting streams from external networks	√	x
Deleting a task for ingesting streams from external networks	√	x
Querying tasks for ingesting streams from external networks	√	√
Configuring the billing mode	√	x
Querying tenant information	√	√
Creating a transcoding template	√	x
Deleting a transcoding template	√	x
Modifying a transcoding template	√	x
Querying transcoding templates	√	√

Operation	Live FullAccess	Live ReadOnlyAccess
Adding transcoding SEI	√	x
Querying HTTP status codes for pulling streams	√	√
Querying the stream frame rate	√	√
Querying the stream bitrate	√	√
Querying the real-time stream bitrate	√	√
Querying the real-time stream frame rate	√	√
Querying the duration of recordings	√	√
Querying the number of snapshots	√	√
Querying the number of streams by domain name	√	√
Querying historical streams	√	√
Querying playback profiles	√	√
Querying the number of online streamers	√	√
Querying the playback bandwidth trend	√	√
Querying the playback traffic trend	√	√
Querying the peak playback bandwidth	√	√
Querying the total playback traffic	√	√
Querying the upstream bandwidth	√	√
Querying the distribution of metrics in each region	√	√
Querying the playback bandwidth trend	√	√

Operation	Live FullAccess	Live ReadOnlyAccess
Querying the playback traffic trend	√	√
Querying the real-time upstream bandwidth	√	√
Querying the real-time downstream bandwidth	√	√
Querying the real-time stream bandwidth	√	√
Querying details about the real-time downstream bandwidth	√	√
Querying the bandwidth trend by stream	√	√
Querying the duration of transcoded outputs	√	√
Querying the number of transcoding tasks	√	√
Querying the number of streams for real-time transcoding	√	√
Querying the viewer trend by stream	√	√
Querying the number of online viewers by stream	√	√
Querying the number of online viewers	√	√
Querying details about the number of online viewers	√	√

Helpful Links

- IAM Service Overview
- Creating a User and Assigning Live Permissions

Live FullAccess Policy

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
```



```
                "live:*:*"
            ]
        }
    ]
}
```

Live ReadOnlyAccess Policy

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "live:*:get*",
                "live:*:list*"
            ]
        }
    ]
}
```

6.4.2 Access Control for Live

Identity Authentication

You can access Live through the Live console, APIs, and SDKs. Regardless of the access method, requests are sent through REST APIs provided by Live.

Live APIs can be accessed only after requests are authenticated. You can use either of the following authentication methods to call APIs:

- Token authentication: Requests are authenticated using tokens.
- AK/SK authentication: Requests are encrypted using AK/SK pairs. AK/SK authentication is recommended because it is more secure than token authentication.

For details, see **Authentication**.

Access Control

Live supports access control based on IAM permissions and hotlink protection.

Table 6-3 Live access control

Method	Description	Details
IAM permissions	IAM permissions define which actions on your cloud resources are allowed or denied. After creating an IAM user, the administrator needs to add them to a user group and grant the permissions required by Live to the user group. Then, all users in this group automatically inherit the granted permissions.	**Permissions Management**

Method	Description	Details
Hotlink protection	To prevent your data on Live from being stolen, Live provides referer validation, URL validation, and access control list (ACL) to identify and filter out malicious visitors. Only authorized visitors can use Live.	**Hotlink Protection**

6.5 Data Protection

Live takes different measures to keep data stored in Live secure and reliable.

Table 6-4 Live data protection methods and features

Measure	Description	Details
Transmission encryption (HTTPS)	Live supports HTTP and HTTPS, but HTTPS is recommended as it is more secure than HTTP.	**HTTPS Configuration**
Sensitive data encryption and protection	Sensitive data configured by tenants, such as URLs used for validation, is stored using secure encryption algorithms.	-

6.6 Resilience

Live provides a four-level reliability architecture. It ensures data durability and reliability through technical solutions such as cross-region/AZ data DR, intelligent scheduling at edge nodes, and automatic microservice scale-out.

Reliability Level	Measure
Level 1 Service reliability	Automatic microservice scale-out
Level 2 Access reliability	Scheduling at multiple edge nodes
Level 3 Data center reliability	Multi-AZ
Level 4 Region reliability	Multi-region

7 Constraints

7.1 Regions

Live includes Cloud Live and Media Live. Currently, the origin servers are deployed only in the following regions:

- Cloud Live
  - Huawei Cloud Chinese Mainland website: CN North-Beijing4 and AP-Singapore
  - Huawei Cloud International website: CN North-Beijing4, AP-Singapore, and LA-Sao Paulo1
- Media Live
  - Huawei Cloud Chinese Mainland website: not supported
  - Huawei Cloud International website: AP-Singapore and ME-Riyadh

The origin server in CN North-Beijing1 is no longer available for new service functions and users due to limited resources. Support will be provided only for existing service functions and users. If you want to try the latest functions of Live or your service volume is large, you are advised to migrate your workloads to the primary origin server of Live (CN North-Beijing4 for users in the Chinese mainland and AP-Singapore for international users).

7.2 Domain Names

By default, you can add up to 64 domain names in your account.

If you want to livestream an event in the Chinese mainland or globally, ensure that the domain name to be added has been licensed by the Ministry of Industry and Information Technology (MIIT) and the ICP license is valid.

NOTICE

If you add, modify, or delete a domain name, the change will be displayed in **My Resources** within 24 hours. Please check the data later.

7.3 Cloud Live

Before using Cloud Live, understand the following constraints.

Constraints

Table 7-1 Constraints

Item	Description
Concurrent livestreams	There is no restriction on concurrent livestreams. If you require a bandwidth exceeding 100 Gbit/s, you are advised to **submit a service ticket** for further consultation.
Stream push	There is no limit on the bitrate. Common resolutions and bitrates are supported. To ensure smooth streaming, a bitrate no greater than 4 Mbit/s is recommended.
Playback	You can play a livestream only after the ingest and streaming domain names are associated. The values of **AppName** and **StreamName** in the streaming URL must be the same as those in the ingest URL.

Item	Description
Input/Output format	**Cloud Stream Live** • Video packaging protocols – RTMP and FLV Video codec: H.264 and H.265, etc. – HLS output protocol Video codec: H.264 and H.265, etc. • Audio packaging protocols – RTMP and FLV Audio codec: AAC, etc. – HLS output protocol Audio codec: AAC **Low Latency Live (LLL)** • Transmission protocol requirements – Signaling transmission protocol: HTTPS, HTTP, and UDP are supported. HTTP listening port 80 is enabled. HTTP and UDP are insecure. – Media transmission protocol: UDP and TCP are supported. Media streams can be encrypted. It is recommended that DTLS be used for signaling negotiation, as UDP is insecure. • Encoding format requirements – Audience: The supported video encoding format is H.264 without B frames, and the supported audio encoding format is OPUS. – Streamer: The supported video encoding format is H.264 without B frames, and the supported audio encoding format is AAC (LC/HE). **NOTE** • If the format of the streaming device is not supported, you need to **create a transcoding template**. LLL supports real-time transcoding, and you will be billed for using this function. The conversion from AAC to OPUS is supported and no fee will be generated. • To reduce latency, you can set the GOP at the streaming device to 2s.
Streaming management	This function is available only in CN North-Beijing4, AP-Singapore, and EU-Dublin.

API Constraints

Live sets a limit on the number of API calls to prevent service interruption caused by repeated API calls in a short period of time.

Table 7-2 API request throttling

API Category	API Name	Max. User Requests	Max. API Requests
Domain name management	• Creating a domain name • Querying domain names	300 times/ minute	3,000 times/minute
	• Deleting a domain name • Modifying a domain name • Mapping domain names • Deleting a domain name mapping • Configuring the domain name IPv6 switch • Modifying the HLS configuration of a domain name • Querying HLS configurations of domain names	100 times/ minute	1,000 times/minute
	• Modifying the streaming domain name delay • Modifying origin pull settings	30 times/minute	100 times/minute
	• Querying the streaming domain name delay • Querying origin pull settings	30 times/minute	300 times/minute

API Category	API Name	Max. User Requests	Max. API Requests
Transcoding template management	• Creating a transcoding template • Deleting a transcoding template • Modifying a transcoding template • Querying transcoding templates	100 times/ minute	1,000 times/minute
Stream management	• Disabling stream push • Modifying the attribute of a disabled stream	4,000 times/ minute	12,000 times/ minute
	• Querying disabled streams • Resuming stream push	3,000 times/ minute	6,000 times/minute
	Pausing stream push	300 times/ minute	3,000 times/minute
Notification management	• Adding and modifying stream notification configurations • Querying stream notification configurations • Deleting stream notification configurations	300 times/ minute	3,000 times/minute

API Category	API Name	Max. User Requests	Max. API Requests
Authentication	• Configuring a referer validation ACL • Deleting a referer validation ACL • Querying referer validation ACLs • Querying IP ACLs • Modifying an IP ACL • Generating a signed URL	300 times/ minute	3,000 times/minute
	Querying supported areas of a streaming domain name	30 times/minute	300 times/minute
	Modifying supported areas of a streaming domain name	30 times/minute	100 times/minute
	• Querying the URL validation configuration of a specified domain name • Modifying the URL validation configuration of a specified domain name • Deleting the URL validation configuration of a specified domain name	150 times/ minute	300 times/minute
Log management	Obtaining livestreaming logs	300 times/ minute	3,000 times/minute
HTTPS certificate management	Querying HTTPS certificate information	300 times/ minute	3,000 times/minute

API Category	API Name	Max. User Requests	Max. API Requests
	• Modifying the HTTPS certificate configuration of a specified domain name • Querying the HTTPS certificate configuration of a specified domain name • Deleting the HTTPS certificate configuration of a specified domain name	150 times/ minute	300 times/minute
OBS bucket management	Granting or canceling authorization of accessing OBS buckets	150 times/ minute	300 times/minute
Livestreaming watermark management	Creating a watermark template Modifying a watermark template Deleting a watermark template Creating a watermark rule Modifying a watermark rule Deleting a watermark rule Querying watermark rule configurations	50 times/minute	200 times/minute

API Category	API Name	Max. User Requests	Max. API Requests
	Querying watermark templates Querying watermark template configurations Querying watermark rules	300 times/ minute	3,000 times/minute
Statistical analysis	Querying the peak bandwidth	20 times/second	200 times/second
	Querying the total playback traffic	20 times/second	300 times/second
	Querying HTTP status codes	30 times/second	300 times/second
	Querying the duration of transcoded outputs	20 times/second	200 times/second
	Querying upstream bandwidth	20 times/second	300 times/second
	Querying the number of streams by domain name	20 times/second	300 times/second
	Querying historical streams	30 times/second	300 times/second
	Querying playback profiles	10 times/second	100 times/second
	Querying the distribution of livestreaming metrics by region	50 times/second	150 times/second
Stream analytics	Querying the stream frame rate	10 times/second	200 times/second
	Querying the stream bitrate	10 times/second	200 times/second

API Category	API Name	Max. User Requests	Max. API Requests
	Querying stream analytics data	10 times/second	200 times/second
	Querying CDN upstream quality data	30 times/second	300 times/second
	Querying ongoing streams	20 times/second	60 times/second

7.4 Media Live

Before using Media Live, understand the following constraints.

PoP Distribution

If Media Live uses Huawei Cloud CDN for acceleration, see **CDN PoP Distribution**.

Channel Inputs

Table 7-3 Channel input constraints

Item	Description
Transcoded stream frame rate	The transcoded stream frame rate cannot be higher than the input frame rate.
Transcoded stream resolution	The transcoded stream resolution cannot be higher than the input resolution.
Audio/Video encoder	• Video: H.264 and H.265 • Audio: AAC, MP1, MP2, and MP3 Note: MP1, MP2, and MP3 are only available for TS inputs. By default, the inputs are transcoded into AAC outputs. • Subtitling is not supported.

Item	Description
Input specifications	Details: • RTMP stream push is supported. • HTTP-FLV stream pull is supported. The sequence header must be carried when playback starts. • HLS-PULL stream pull is supported, as well as the HLS V3, HTTP, or HTTPS. • SRT-Listener stream push is supported. Only TS streams are supported and **streamid** is optional. • SRT-Caller stream pull is supported. Only TS streams are supported. • Encrypted streams are not supported. • Audio-only inputs are not supported, with at least one video stream required. Video-only outputs are not supported. For video-only outputs, one mute stream will be automatically added. • The encoder parameters of the primary and standby inputs must be the same. Otherwise, the playback may be interrupted during input redundancy. • Inputs: bitrate ≤ 50 Mbit/s, frame rate ≤ 60 FPS, resolution ≤ 4K • An input audio/video timestamp jump of less than 3 seconds may cause playback stutter. You are advised to reset the input stream timestamp when re-pushing with the encoder.
Input GOP duration	Recommendations: • Set the value to 1 second or an integer multiple of 1 second. • Set the segment duration configured for a channel to an integer multiple of the GOP duration.
Ad signal arrival time	SCTE-35 signals must arrive ahead of ad insertion points to ensure that downstream systems have sufficient time to process ad information and enable seamless ad insertion.

Channel Outputs

Table 7-4 Channel output constraints

Item	Description
Audio/Video encoder	• Video: H.264 and H.265 • Audio: AAC • Subtitling is not supported.
MSS	Neither encrypted nor unencrypted MSS streams (H.265) can be output.

Item	Description
DRM encryption	DRM encryption algorithms supported: • HLS: sample-aes • DASH: CENC • MSS: CENC

Resources

Table 7-5 Resource constraints

Item	Description
Number of channels	A tenant can create a maximum of 500 channels. If you need more channels, **submit a service ticket** to increase the quota.

Functions

Table 7-6 Function constraints

Item	Description
Channel function	• All channels support only single-bitrate inputs, and multi-bitrate outputs are available only after transcoding. • **RTMP_PUSH** channels require RTMP ingest domain names. **SRT_PUSH** channels require SRT ingest domain names. **SRT_PUSH** channels and **RTMP_PUSH** channels cannot be created simultaneously for the same domain name.

Clients

Table 7-7 Client constraints

Item	Description
Encoding format	In iOS 16.0 or later, the maximum HE-AAC audio bitrate is 64 Kbit/s. This constraint does not apply to AAC-LC.
Client	If the displayed segment duration of the source stream is different from the actual segment duration, the audio and video may be out of sync. To solve this potential issue, the client should support audio-to-video synchronization.

APIs

Media Live sets a limit on the number of API calls to prevent service interruption caused by repeated API calls in a short period of time.

Table 7-8 API request throttling

API Category	API Name	Max. User Requests	Max. API Requests
OTT Channel Management	• Creating an OTT Channel • Querying Channel Information • Deleting Channel Information • Modifying Channel Packaging Information • Modifying Channel Input Information • Modifying Channel Recording Information • Modifying General Channel Information • Changing the Channel Status • Modifying Channel Transcoding Template Information • Querying Channel Statistics	80 times/minute	80 times/minute

7.5 Content Compliance

Live does not allow accessing websites that violate related laws and regulations, including but not limited to:

- Websites that contain pornographic content or content related to gambling, illegal drugs, frauds, or infringement
- Gaming websites that run on illegal private servers
- Websites that provide pirated games/software/videos
- P2P lending websites
- Unofficial lottery websites
- Unlicensed hospital and pharmaceutical websites
- Inaccessible websites or websites that do not contain any substantial information

NOTE

- If the use of your domain name violates related laws and regulations, you shall bear the related risks.
- If any pornographic content or content related to gambling, illegal drugs, or frauds is found on your domain name, the domain name and other domain names that use the same origin server will be deleted from Live and can no longer access Live. Acceleration domain name quota of the account will be reduced to 0.

8 Related Services

Before using live recording and snapshot capturing, you must enable the related services listed in **Table 8-1**.

Table 8-1 Related services

Interactive Function	Service Name	Reference
Saving snapshots or recordings in OBS buckets	OBS	**Creating a Bucket** **Uploading a File**

9 Concepts

9.1 Concepts

Stream Push

A process of transmitting collected, encoded, and packaged live content to the origin server

Stream Pull

A process of pulling live content from the origin server to a specific address for playback

Edge Streaming

A livestream is pushed to a nearby edge node. Then, the scheduling system of Huawei Cloud transmits the livestream to the origin server for processing and distribution. This ensures that the livestream is transmitted over the optimal uplink network, with minimized lags.

Streaming Domain Name

Domain name for playing livestreams. You must add a streaming domain name to Live before using Live. After a streaming domain name is added, a streaming URL will be generated. Then you need to **assemble the streaming URL**.

Ingest Domain Name

Domain name for pushing livestreams. You must add an ingest domain name to Live before using Live. After an ingest domain name is added, an ingest URL will be generated. Then you need to **assemble the ingest URL**.

CNAME Record

After ingest and streaming domain names are configured, the system assigns a respective CNAME record to the ingest and streaming domain names. You must

add the records to your domains' DNS records for livestreaming acceleration to take effect.

H.264

H.264 or MPEG-4 Part 10, a video compression standard developed by the ITU-T Video Coding Experts Group (VCEG) and ISO/IEC JTC1 Moving Picture Experts Group (MPEG).

H.265

H.265 is a video compression standard, designed as a successor to H.264. Based on the video coding standard H.264, H.265 keeps some of the original technologies, while improves some relevant techniques. H.265 adopts the advanced techniques to improve the bit-stream, promote the coding quality, and better the relationship between time delay and algorithm complexity, to achieve best possible optimization. H.264 can transmit SD (resolution lower than 1280 x 720) digital images at a rate lower than 1 Mbit/s, whereas H.265 can transmit standard HD (resolution of 1280 x 720) audio and video at a rate of 1 Mbit/s to 2 Mbit/s.

Low-Bitrate HD

Based on the human visual system model and Huawei's transcoding technology, Live analyzes each scenario, action, content, and texture in a video to deliver lower bitrate while keeping the bandwidth costs down but without compromising the video quality.

Real-time Transcoding

A process of transcoding one livestream into another or more in real time to meet different bandwidth, device, and user requirements

Weak Network

The QoS of a weak network is not stable.

95th Percentile Bandwidth

A billing option. Within a calendar month, the bandwidth is measured and recorded every 5 minutes on each valid day. At the end of the month, the records are sorted from the highest to the lowest, and the top 5% of the recorded bandwidth values are thrown away. Then the highest bandwidth value in the remaining records is the billable bandwidth of the month.

Stream Name

This is used to identify a livestream with the domain name and **App Name**. **Stream Name** can be customized.

App Name

Path for storing streaming media files. The default value is **live**.

Livestreaming URL

This includes an ingest URL and streaming URL. A livestreaming URL consists of the domain name, **App Name**, and **Stream Name**. You can create multiple applications for each domain name, and create multiple livestreams for each application.

9.2 Regions and AZs

Concepts

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

- Regions are divided from the dimensions of 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 only or for specific tenants.
- An AZ contains one or multiple physical data centers. Each AZ has independent cooling, fire extinguishing, moisture-proof, 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 9-1 shows the relationship between regions and AZs.

Figure 9-1 Regions and AZs