Solbox

Solbox Media Streaming

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1. Content

1.1. Solbox Media Streaming

Guaranteed high-quality and high-definition multimedia streaming service on various devices anytime, anywhere

As there are more and more end users enjoying high-definition OTT video content using various devices such as PC, TV, OTT set-top boxes, smart phones, tablets, and game terminals, the media service environment is getting more complex.

As a result, OTT service providers face the challenge of providing high-definition, high-quality video and live video services reliably through various user terminals.

In other words, it is necessary to prevent the transition of existing subscribers, attract new users, and maximize advertising revenue and content service income through improvement of user experience.

Solbox Media Streaming solutions provide reliable, high-quality media streaming services regardless of the user's device and service scale on the edge platform of the telecommunication company.

Solbox Media Streaming solution provides the best media service experience with on-demand packaging technology, ultra-low latency live streaming technology, customized ad insertion technology, subtitle insertion technology and mass storage technology.

1.1.1. VOD Streaming

VOD Streaming is a service that allows users to watch the content you want at any time you want.

In most cases, this applies to services such as movies, e-learning, and broadcast replay. When an end-user requests the media contents, it transmits the video content stored in the mass storage with proper format according to the user's device.

1.1.2. Live Streaming

Live Streaming is a service that provides live video streaming or scheduled video to onlin viewers in real time.

In most cases, this applies to services such as movies, e-learning, and broadcast replay. Live Streaming receives broadcast data directly from the live encoder and transmits it in real time, or relays and transmits real-time broadcast streaming transmitted from the origin transmission server.

2. Benefit

- Improves the user experience of Internet video services by providing video streaming services suitable for various user terminals such as PC, TV, OTT set-top box, smartphone, tablet, and game terminal.
- The servers at the edge of the carrier handle user requests, providing fast, reliable service in the event of a surge in user access to popular content
- Ultra low latency streaming service based on industry standards to enhance the user experience of real-time Internet broadcasting.
- Flexible service scalability and cost savings in the event of large service expansion as service users grow
- Maximizes advertising revenue from content providers by providing an industry standard VAST(Digital Video Ad Serving Template) based Ad insertion services and customized advertising

3. Key Features

- **On Demand Packaging**

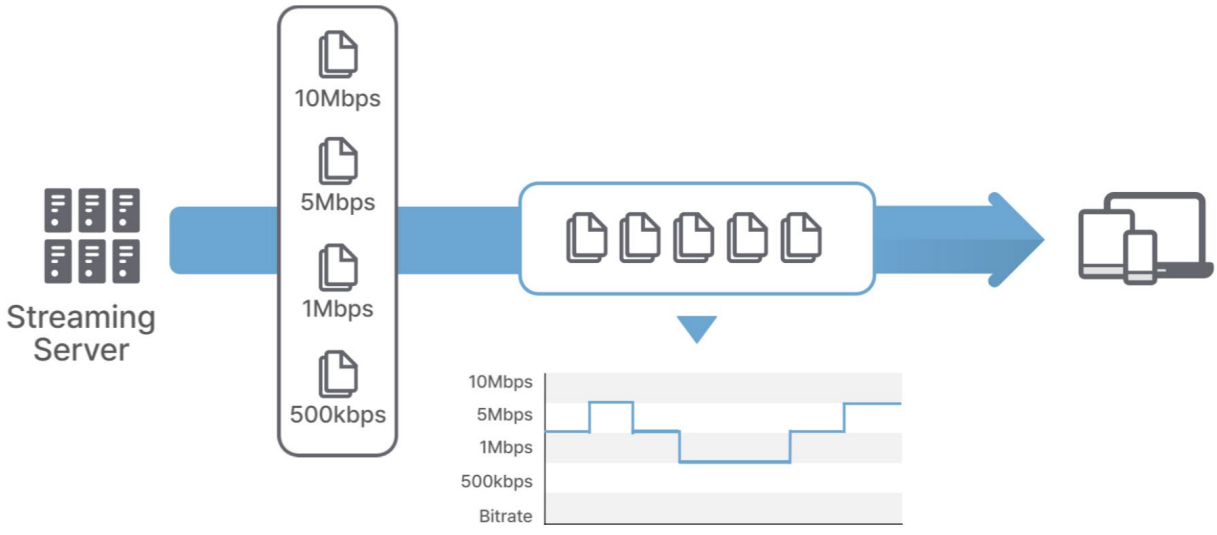
  When streaming Internet videos, storage costs typically increase because pre-packaged files (such as HLS and DASH) are first stored on storage for a single video before providing streaming services. Solbox Media Streaming service can help service providers to save their storage costs by storing service contents as a single video file and then dynamically packaging and streaming by each streaming protocol when Internet users request video contents that they want to watch.

- **Preview Service**

  Provides a preview service that allows online users to view some of the content before they pay for it

- **ABR Streaming**

  Automatically selects the optimal video quality according to the user's service connection environment, such as network conditions, transmission speed, and bandwidth, and provides a seamless streaming service by minimizing delay or buffering



Automatically selects the optimal video quality according to the user's service connection

- **Multilingual Subtitles/Audio Service Support**

  Supports multilingual audio and caption streaming services for high-quality audio channels(Dolby 5.1ch, Atmos, etc.) and general audio channels, allowing online users to select and play the content according to their network environment.

- **User Authentication Service**

  Solbox Media Streaming service provides a security service so that only authorized users and contents can be accessed through a security token-based authentication process. For user authentication services, we provide APIs and SDK to help customers easily generate service URLs and security tokens.

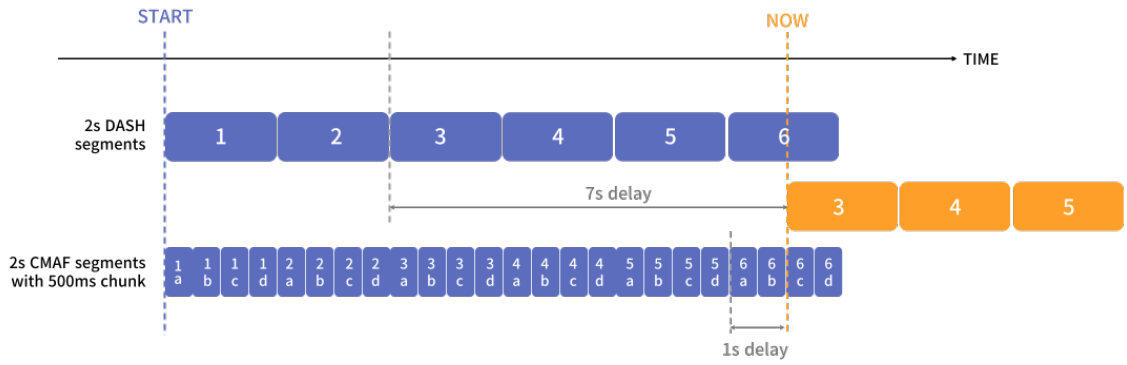
- **Content Encryption Service**

  Content encryption service provides content encryption services to prevent unauthorized users from playing without a decryption key even if they receive content.

  AES-128 and SAMPLE-AES are supported as encryption methods.

- **Live ultra-low latency streaming service**

  For typical HTTP live streaming, there is a delay of approximately 10 seconds or more before the user player plays the live video transmitted by the broadcaster. However, this can help you to provide an ultra low latency streaming service based on the industry standard Common Media Applications Format (CMAF) that can reduce the delay of these live services to less than 1 second. Solbox Media Streaming service supports CMAF DASH and Low-Latency HLS protocols.



Low latency CMAF DASH Streaming

- **Targeted Ad Insertion Service**

  When a user requests a video streaming service, the user receives targeted advertising content from the Ad server and inserts the Ad into the video streaming to provide a targeted Ad insertion service. It also supports VAST(Video Ad Serving Template), an industry standard for ad server interworking.

4. Applications

- Internet OTT Operation Service
- Audio/Video Publishing
- Online Education
- Sports/Game Broadcast
- Internet Personal Broadcasting
- Live Commerce

5. Specification

Category	Description
Codec	• Video: H.264(AVC), H.265(HEVC) • Audio: AAC, MP3, FLAC, AC3
File Format	• MP4 • FLV • MOV • MP3 • FLAC
Output Protocol	• MPEG_DASH (Dynamic Adaptive Streaming Over HTTP) • HLS (HTTP Live Streaming) • CMAF, LL-HLS • RTMP • Microsoft Smooth Streaming • Pseudo Streaming
Input Protocol	• RTMP • RTSP/RTP • MPEG-TS