What's new in HTTP Live Streaming

WWDC 2024

June 2024

Contents

HLS Specification

The most recent specification of HTTP Live Streaming is RFC 8216. That document was published in August 2017. A more up-to-date reference is the current Internet-Draft draft-pantos-hls-rfc8216bis "HTTP Live Streaming 2nd Edition".

The URL https://developer.apple.com/streaming/ contains links to the above documents as well as a preliminary version of the next update to the Internet-Draft.

New Interstitial EXT-X-DATERANGE attributes

Three new attributes are recognized on Interstitial EXT-X-DATERANGE tags. These all take quoted-string values, but only have a couple of valid strings. These attributes are described more formally in the preliminary internet-Draft mentioned above.

The first is X-CONTENT-MAY-VARY, which may have the value "YES" or "NO". This is used as a hint to let clients know how coordinated playback of the same asset will behave across multiple players (such as Apple's SharePlay). A value of "NO" indicates all players will get the same interstitial content. If X-CONTENT-MAY-VARY is missing it is considered to have a value of "YES".

The other two attributes indicate how the interstitial content should be represented on a playback timeline.

One attribute is X-TIMELINE-OCCUPIES, which may have the value "POINT" or "RANGE". This indicates whether the interstitial should be presented as a single point on the timeline or as a range. If X-TIMELINE-OCCUPIES is missing it is considered to have a value of "POINT" (which is typical for VOD presentations), although clients may infer a value of "RANGE" if the interstitial has positive non-zero resumption offset. We expect the most common use for RANGE to be ads in live content.

The other attribute is X-TIMELINE-STYLE, which may have the value "HIGHLIGHT" or "PRIMARY". This indicates whether the interstitial is intended to be presented as distinct from the content ("HIGHLIGHT") or not differentiated ("PRIMARY"). If X-TIMELINE-STYLE is missing it is considered to have a value of "HIGHLIGHT". (This is typical for ads. We expect the most common use for PRIMARY to be ratings bumpers and post-roll content like dub cards.)

Media Formats and Tools

Apple distributes several tools for segmenting and validating HLS streams. These are available from the Apple developer downloads site. A link is available at the URL above.

The tools are updated several times per year and are provided for macOS and Linux systems.

Signaling HDR10+ content

Within a Multivariant Playlist the codec is signaled via a format in the CODECS attribute. There is no way to signal HDR10+ in a format. To indicate that your content includes HDR10+ video, supply a SUPPLEMENTAL-CODECS attribute containing the appropriate format and brand (separated by a slash character). The format should match the HDR10 format. The correct brand for HDR10+ is `cdm4`. For example, SUPPLEMENTAL–CODECS=`"hvc1.2.20000000.L123.B0/cdm4"`.

AV1 support for DV 10.x

Some devices support Dolby Vision profile 10. The supported profiles are 10, 10.1 and 10.4. If the profile is 10.1 or 10.4, this must be indicated using a SUPPLEMENTAL-CODECS attribute with the appropriate brand as well as the correct VIDEO-RANGE. In the case of 10.1 this should be a brand of 'db1p' and a VIDEO-RANGE of PQ. For 10.4 this should be a brand of 'db4h' and a VIDEO-RANGE of HLG. For example, `CODECS="av01.0.13M.10.0.112",SUPPLEMENTAL—CODECS="dav1.10.09/db4h",VIDEO—RANGE=HLG`.

Enhancements to metadata support in HLS

Fragmented MP4 (MPEG-4) files can contain timed metadata ('mebx') tracks. Previously, the player supported a single concurrent metadata track with the audio and video. Now multiple concurrent metadata tracks are handled.

However, the current *mediafilesegmenter* tool only supports mebx tracks using certain keys. For example, the key `com.apple.quicktime.video.parallax—coverage.measured` (video contour map metadata). The tracks must be associated with an audio or video track, via a TrackReferenceTypeBox of type `'cdsc'`.

Metrics and Logging

AVMetrics API

 This is a new AVFoundation API that allows developers to register for and listen to performance and playback events. This is an opt-in interface. The subscriber will receive various AVMetricEvent subclass objects. The subscriber can elect to receive only subset of possible events. For more information, see the AVFoundation documentation.

AVPlayerItemErrorLogEvent addition

Developer who subscribe to AVPlayerItemErrorLogEvent can now receive all the HTTPResponse header fields as an NSDictionary.

Common Media Client Data

AVPlayer now supports the Common Media Client Data (CMCD) standard. This is a specification defined by the Consumer Technology Association as part of their WAVE project.

CMCD enables players to send information to Content Delivery Networks (CDNs) with each object request. This allows the the CDN to do Quality of Service (QoS) monitoring and delivery optimization. While the standard allows three different modes for transmitting the data, AVPlayer uses only the preferred mode - as HTTP request headers.

AVPlayer implements most of the keys. The keys content ID ('cid'), requested maximum throughput ('rtp'), and top bitrate ('tb') are not supported. One extension is included. The streaming format key ('sf') will return the value 'lh' for a LL-HLS stream rather than 'h' (HLS).

Clients can opt-in to sending CMCD by setting
`urlAsset.resourceLoader.sendsCommonMediaClientDataAsHTTPHeaders = true`

Deprecations

Deprecating AVAssetResourceLoader for key loading

AVAssetResourceLoader based key loading is no longer supported. You must transition to AVContentKeySession.

AVContentKeySession has been available for many releases and provides a more flexible, reliable and feature-rich mechanism for loading content keys than AVAssetResourceLoader.