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# MPEG-DASH vs. Apple HLS vs. Microsoft Smooth Streaming vs. Adobe HDS

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*such as the proprietary Adobe HTTP Dynamic*
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Written by:
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All existing adaptive HTTP streaming technologies, such as the proprietary Adobe HTTP D
Apple HTTP Live Streaming (HLS), Microsoft Smooth Streaming (MSS), and the only intern
solution MPEG Dynamic Adaptive Streaming over HTTP (MPEG-DASH) follow nearly the sa

The basic idea is to generate multiple versions of the same content (e.g., different bitrates
chop these versions into segments (e.g., two seconds).The segments are provided on a we
downloaded through HTTP standard compliant GET requests. Typically, the relationship b
is described by a manifest, which is provided to the client prior to the streaming session. T
different qualities of the media content and the individual segments of each quality with
Locators (URLs). This structure provides the binding of the segments to the bitrate (resolu
start time, duration of segments). As a consequence each client will first request the man
temporal and structural information for the media content and based on that informatio
segments that fit best for its requirements.

The adaptation to the bitrate or spatial resolution is done on the client side for each segm

## HTML5 Player

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Get Started

## Adaptive Streaming Feature Compari

The following table shows a feature comparison of the proprietary adaptive streaming te
Dynamic Streaming (HDS), Apple HTTP Live Streaming (HLS), Microsoft Smooth Streaming
Dynamic Adaptive Streaming over HTTP (MPEG-DASH) standard. Please note that this con
standard's capabilities, and not reflecting the specific implementation from a certain ven

| Feature | Adobe HDS | Apple HLS | Micr Smo |
|---|---|---|---|
| Deployment on Ordinary HTTP Servers | | tick_green_sm2 | |
| Official International Standard (e.g., | | | |

| Flexible Content Protection with Common Encryption (DRM) | tick_green_sm2 | tick_green_sm2 | tick_green_sm2 | tick_green_sm2 |
|---|---|---|---|---|
| Closed Captions / Subtitles | tick_green_sm2 | tick_green_sm2 | tick_green_sm2 | tick_green_sm2 |
| Efficent Ad Insertion | | | | tick_green_sm2 |
| Fast Channel Switching | tick_green_sm2 | | tick_green_sm2 | tick_green_sm2 |
| Protocol Support's multiple CDNs in parallel | | | | tick_green_sm2 |
| HTML5 Support | | | | tick_green_sm2 |
| Support in HbbTV (version 1.5) | | | | tick_green_sm2 |
| [HEVC Ready (UHD/4K)](#) | | | | tick_green_sm2 |
| Agnostic to Video Codecs | | | | tick_green_sm2 |
| Agnostic to Audio Codecs | | | | tick_green_sm2 |
| ISO Base Media File Format Segments | tick_green_sm2 | | tick_green_sm2 | tick_green_sm2 |
| MPEG-2 TS Segments | | tick_green_sm2 | | tick_green_sm2 |
| Segment Format Extensions beyond MPEG | | | | tick_green_sm2 |
| Support for multiplexed (Audio + Video) Content | tick_green_sm2 | tick_green_sm2 | | tick_green_sm2 |
| Support for non-multiplexed (separate Audio, Video) Content | | tick_green_sm2 | tick_green_sm2 | tick_green_sm2 |

| Client Failover | | | | tick_green_sm2 |
|---|---|---|---|---|
| Remove and add Quality Levels during Streaming | | | | tick_green_sm2 |
| Multiple Video Views | | | | tick_green_sm2 |
| Efficient Trick Modes | | | | tick_green_sm2 |

## Deployment on Standard HTTP Servers

MPEG-DASH and also Apple HLS can be used with ordinary HTTP-Servers such as Apache, Nginx, IIS, etc. Adobe as well as Microsoft are using server side mechanisms that need additional logic on the server.



## Official International Standard



MPEG-DASH is an international standard, ratified in 2012 and currently adopted by YouTube, Netflix, etc. Several members of different companies such as Microsoft, Adobe, Apple, Samsung, Akamai, Cisco, Dolby, Ericsson, Harmonic, Qualcomm, Netflix, Intel, bitmovin, InterDigital, etc. have contributed to the standardization. The Apple HLS IETF Internet-Draft *) is driven by one company that is able to change its direction from one day to another. Furthermore, Apple has made no efforts since May 2009 to move the HLS IETF Internet-Draft to an international IETF standard.

## Multiple Audio Channels

Switching between multiple audio channels is especially important for multi language content. MPEG-DASH supports this feature as well as Apple HLS and Microsoft Smooth Streaming.

## Flexible Content Protection with Common Encryption

MPEG Common Encyrption (CENC) allows content encrypted once to be compatible with multiple DRM systems. This is possible, as nearly every DRM system supports AES as content encryption method and only the license key exchange between the client and the server is different.

## Closed Captions / Subtitles

All formats support closed captions or subtitles. Usually they are referenced in the manifest and stored as individual file, e.g., in WebVTT format.

## Efficient Ad Insertion

Ad insertion is possible in all formats through chunk substitution. This means that individual chunks of the original video will simply be replaced by chunks that contain advertisements. MPEG-DASH enables through Periods a standardized interface that enables ad insertion in an efficient way. Which means that still ordinary HTTP servers can be used and no additional, proprietary logic is required to redirect requests for specific chunks to chunks that contain the advertisement.

## Fast Channel Switching

Fast channel switching is a feature that is directly related to the chunk size. As smaller chunks allow faster channel change times than bigger chunks. Apple HLS typically uses 10 second chunks and is optimized for that chunk size. Adobe, Microsoft as well as MPEG-DASH are designed to work with 2 and 4 seconds chunks that allow faster channel change. Additionally the overhead of the MP4 format used in MPEG-DASH and Microsoft has significantly lower overhead than the MPEG-2 Transport Stream (MP2TS) format used in Apple HLS. The tradeoff between large and small chunk sizes is that, small chunks sizes enable fast channel switching, reducing startup latency for some systems (some players start the playback only if they have received the first chunk fully), and allow a more flexible adaptation behavior. On the other side small chunk sizes reduce coding efficiency as Group of Pictures (GOP) need to be smaller

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