

DVB-DASH

Adapting MPEG DASH to DVB content



What is DVB-DASH?

DVB-DASH defines the delivery of live and on-demand TV content over the open internet via HTTP adaptive streaming. It builds on MPEG DASH, which was the first internationally-standardized adaptive bit-rate HTTP-based streaming solution. To improve interoperability and facilitate implementation, additional constraints and requirements are defined in DVB-DASH and some of the video and audio codecs from the DVB toolbox are referenced.

The first release of the specification was published by ETSI in July 2014 as TS 103 285, "DVB MPEG-DASH Profile for Transport of ISO BMFF Based DVB Services over IP Based Networks". The latest release was published in March 2018 and provides the extensions required for HDTV and UHD, including support for an advanced feature set consisting of High Dynamic Range (HDR), High Frame Rate (HFR), a wider colour space and Next Generation Audio (NGA).

Background

DVB published the DVB-DASH specification to facilitate the development of interoperable Adaptive Bit Rate clients for TV services. MPEG DASH is a complex specification with many options, so DVB concentrated on those areas which satisfied the core requirements for live and on-demand use cases. The resulting document is a subset of MPEG DASH with a few extensions along with a set of requirements for the DASH player in the client.

How does it work?

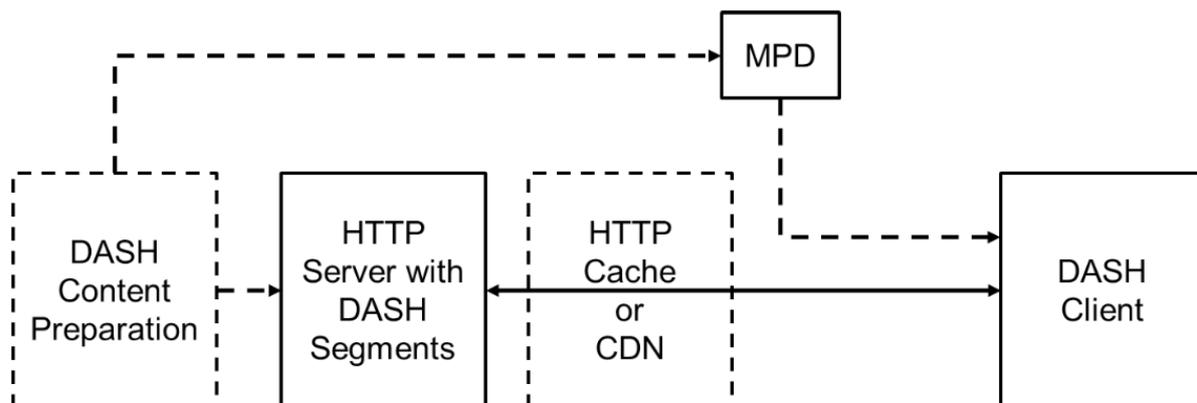


Figure 1. Conceptual architecture of MPEG DASH

Dynamic Adaptive Streaming over HTTP (DASH) works as follows:

- Several versions of the content are kept on the HTTP server, with the audio and video stored separately.
 - The versions of video may differ in data rate, codec, video resolution and video frame rate, among other parameters.
 - The versions of audio may differ in data rate, codec, language and number of audio channels, among other parameters.
- Each version of the content is split into 'segments' where each segment contains a distinct period in time.
- The server informs the DASH clients about the available versions and segments by providing a Media Presentation Description (MPD) file.
- Depending on the bandwidth available between the HTTP server and the client and the client capabilities, the latter selects the most appropriate segment and requests it from the server using the HTTP protocol.
- While playing this segment, the client re-assesses the available bandwidth and selects the next segment, which may be one from a higher or lower bit rate version of the content.

Content protection is based on MPEG Common Encryption, which is DRM vendor agnostic. Subtitles are provided as an XML-based file.

How does it work? (continued)

Taking into account the requirements of content providers, DVB has addressed a number of areas not fully covered by the MPEG DASH specification including:

- High Dynamic Range supporting both HLG10 and PQ10, while not precluding other HDR variants that may be added at a later stage
- Next Generation Audio (NGA) providing an unparalleled level of flexibility in audio, centred on objects rather than channels
- Error handling and error reporting
- Access services including EBU-TT-D subtitles with support for downloadable fonts
- Embedded events carrying application messages, application signalling and programme metadata

Market Deployment

DVB-DASH is normatively referenced in the HbbTV specifications from TS 102 796 v1.4.1 onwards. Many devices in the market already support this profile and content providers across Europe have deployed services using the DVB-DASH profile to take advantage of its functionality.

Next Steps

DVB has started developing a Low Latency extension to DVB-DASH. This new version will provide consistent delivery of live and linear television over DVB-DASH such that the 'encoder to screen' latency as well as start-up delay performance can be on par with other DVB distribution solutions without losing the additional functionalities provided by unicast delivery of TV services.

Links

www.dvb.org/standards
www.dvb.org/webinars
dashif.org

Link to the DVB-DASH standard
Watch the June 2018 webinar on DVB-DASH and download the slides
DVB actively liaises with the DASH Industry Forum