MPEG-DASH: Driving The Growth Of Streaming Using The New HTTP Standard

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Streaming Media West 2011
Video will dominate the Internet and Mobile

- Internet: Real-time video is 50% of the traffic at peak periods
  - notably 30% from Netflix and 11% from YouTube
- Mobile: Video traffic is growing exponentially & is a large portion.

Mobile data more than 2x per year

Video 66% by 2015

MPEG-DASH Standard

- MPEG: Moving Expert Group (MPEG) is working group of ISO/IEC: JTC1/SC29/WG11
  - Developed MPEG-2, MPEGV-4, AVC, MPEG-7, MPEG 21 and others
- DASH: Dynamic Adaptive Streaming of HTTP
  - A specification defining standard delivery format for streaming multimedia over Internet.
  - Defines minimum formats for achieving interoperability between servers and clients
- Developed by industry
  - Over 50 companies and 90 experts
  - Competition and collaboration to achieve the best solution.
The Standard’s Scope

Media Presentation on HTTP Server

Media Presentation Description

Resources located by HTTP-URLs

HTTP/1.1

DASH Client

DASH Control Engine

on-time HTTP requests to segments

HTTP Access Client

Media Engines

The red blocks are in MPEG-DASH’s scope.
Media Presentation Description (MPD) Data Model

- MPD describes accessible Segments and corresponding timing

Media Presentation
- Period, start=0s
  - ...
- Period, start=100s
  - ...
- Period, start=295s
  - ...

Splicing of arbitrary content

Selection of Components

Select/Switch of Bandwidth

Segment Info
- Initialization Segment
  - http://www.e.com/ahs-5.3gp
- Media Segment 1
  - start=0s
  - http://www.e.com/ahs-5-1.3gs
- Media Segment 2
  - start=10s
  - http://www.e.com/ahs-5-2.3gs
- Media Segment 3
  - start=20s
  - http://www.e.com/ahs-5-3.3gs
- Media Segment 20
  - start=190s
  - http://www.e.com/ahs-5-20.3gs

Media Segment 1
- Representation 1
  - bandwidth=500kbit/s
  - width 640, height 480
  - duration=10s
  - Template: ./ahs-5-$Index$.3gs

Media Segment 2
- Representation 2
  - bandwidth=250kbit/s
  - width 640, height 480

November 2011
Highlighted Features

- Live, on-demand and time-shift services.
- Efficient and ease of use of existing CDNs, proxies, caches, NATs and firewalls.
- Control of entire streaming session by the client.
- Independency of request size and segment size (byte range requests).
- The concept of selectable and switchable streams.
- Support of seamless switching of tracks.
- Supporting various segment formats:
  - ISO base media FF and MPEG-2 TS.
  - Codec independent: guidelines for integrating any other format.
Highlighted Features

- Simple splicing and (targeted) ad insertion.
- Support for efficient trick mode.
- Clock drift control.
- Content descriptors for protection, accessibility, rating, etc.
- Signaling, delivery, utilization of multiple DRM schemes.
- Manifest fragmentation and assembly for external referencing.
- Multiple base URLs for the same content.
- Support for Scalable Video Coding (SVC), Multiview Video Coding (MVC) and any interdependent coding.
- Definition of quality metrics for logging processes.
- Profile: restriction of DASH and system features.
Next Steps

- Complete the standardization work
  - Specification completion in the next few months;
  - Conformance, interoperability and reference software.

- Make it simple to deploy
  - DASH is rich and simple at the same time, understand more detailed market needs.
  - Collaborate with system creators on how to integrate DASH in various systems.
  - Integrate it into the web – HTML5.
  - Promotional efforts: Licensing, interops, etc.

- Get it deployed.
MPEG-DASH

Key Features for Mobile

Adaptive-optimized format ➔ superior user experience
Standard web servers ➔ converged services
Common encryption ➔ higher value content
Unmuxed A/V ➔ greater efficiency
Modern file format ➔ greater flexibility
Open standard ➔ commonality confidence
A leader in streaming media over **HTTP for 5 years** – SmoothHD, HDN1, HLS and HDS.

Pushing **8.5 Terabits/s today**, many times that tomorrow – HTTP is the only way we can scale to build the future broadcast network.

**Convergence** allows for improved quality of end-user experience by allowing encoding, delivery and client companies to FOCUS.

Akamai believes that DASH offers a viable solution to HTTP streaming fragmentation and is committed to supporting DASH as it builds out the next generation broadcast network.

Timelines, profile support and product details will be dependent on customer demand and have not yet been determined.

We can use our **intelligent cloud** to do some interesting things at the edge with DASH that standard HTTP servers cannot.
Harmonic DASH Solution

- A new family of software and appliance solutions for Adaptive Streaming
- Complete solution SW upgradable to MPEG DASH *

ProMedia Software Family

- Carbon
  - File-Based Transcoder
- Live
  - Real-Time Transcoder
- Package
  - Stream Preparation
- Origin
  - Streaming Server

ProMedia Application Servers

WFS
- File-Based Media Processing & Control

NMX
- Real-Time Digital Service Manager

(*) Requires special SW license
MPEG-DASH On Demand

Key features for scalable on-demand services

Single file format → cache efficiency
Standard web servers → lower CDN costs
Common encryption → DRM agnostic
Unmuxed A/V → multi-language
Modern file format → simplicity

An open standards development process
Questions?