The future of Video Delivery: OTT Multiscreen system implementation overview

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Agenda.

- Comutel news
- IPTV vs OTT
- Business models
- ABR
- END-to-END delivery
- Streaming formats
- iDEAS
Comutel – Member of Telelink group.

- Strong presence in 7 countries in Central and SEE
- Best-of-class network integration competence
- Largest wireless network rollout manager on the Balkans
- More than 700 employees & manage over 2000 subcontracted workforce
- International team with comprehensive expertise
Comutel – Cisco Gold Partnership.
IPTV, Internet Streaming, IP Video, OTT – Can you please explain?

IPTV is:
- managed
- based on QoS
- multicast
- CBR

OTT is:
- best effort
- driven by QoE
- unicast
- ABR
Internet + Services Network = Next Gen Internet

Services Network

Simple access business model
Built for scale
Limited security/privacy
Varied business model
Focused on services
Built for performance
SLA guarantees

Internet

Flexible, massive scale, performance, secure, services anywhere on any device

The Future of Video Delivery
Motivation: increase variety of services on any device and deliver a common experience everywhere.

**What** can you watch?

**When** can you watch?

**Where** can you watch?
Problem?

Managed and unmanaged:
- Transport
- Content
- Devices

The Future of Video Delivery
Any time.
Market players.
How to?

- **Content rights**: Device and technology based. Security and measurement.
- **Monetization**: Premium content subscription. Fees.
- **Technology**: Video impact on infrastructure. Video headend expenses.
Business models.

SUPPLEMENT.

OR

SUPPLANT.
Do not change the web! Adapt.

Adaptive Bitrate Streaming detects a user’s available bandwidth in real time and calibrates the video stream accordingly to always deliver the best possible picture quality.
How to deliver as much video as users can take.

- Imitation of streaming via short downloads.
- Improved QoE.
- Adaptation to Dynamic Conditions and Device Capabilities.
- Use of HTTP.
ABR.
ABR. cont. SMART CLIENTS.
The OTT formats.

HTTP Live Streaming (HLS) – Apple
Live Smooth Streaming – Microsoft
HTTP Dynamic Streaming – Adobe Flash
WebM – Google
Dynamic Adaptive Streaming over HTTP (MPEG-DASH) – MPEG/ISO
The stream segmented in Live Smooth Streaming consists of the following files:

- **1 server manifest file - *.ism**
  It describes the relationship between media tracks, bit rates and files on disk. Based on SMIL 2.2 or SMIL 2.0 XML format spec.

- **1 client manifest file - *.ismc**
  It describes the available streams to the client with the codecs used, bit rates encoded, video resolutions.

  http://DomainName/TF1.ism/QualityLevels(bitrate)/Fragments(video = startime)
Mpeg4.toLiveSmoothStreaming();

Manifest file (*.ismc):

<SmoothStreamingMedia MajorVersion="2" MinorVersion="0" TimeScale="10000000" Duration="0"
LookAheadFragmentCount="2" IsLive="TRUE" DVRWindowLength="300000000"/>
<StreamIndex Type="audio" QualityLevels="1" TimeScale="10000000" Language="en" Name="audio_1"
Chunks="4" Url="QualityLevels{{bitrate}}/Fragments{audio_1={{start time}}}/">
<QualityLevel Index="0" Bitrate="128000" CodecPrivateData="1210" SamplingRate="44100" Channels="2"
BitsPerSample="16" PacketSize="4" AudioTag="255" FourCC="AAC"/>
<ct="3441119027664" d="29953741"/>
</StreamIndex>
</SmoothStreamingMedia>

The Future of Video Delivery
End-to-End.
Transcoders.

The Future of Video Delivery
Origin server.

Origin Server with Mux & Scrambler functionalities

Stream Adaptation 1
For Win7 phones.
Live Smooth Streaming
2.0 4 video, 1 audio
no subtitles
Scrambled, DRM 1

Stream Adaptation 2
For Xbox
Live Smooth Streaming 2.2
4 video, 1 audio
1 subtitles
Scrambled, DRM 2

Stream Adaptation N
For iPad
HLS
6 video, 1 audio
1 subtitles
Scrambled, DRM 4

The Future of Video Delivery
Content distribution.

Streamer Pool 1

Streamer Pool 2

Streamer Pool 3

Origin

USER

The Future of Video Delivery
Comparison of adaptive streaming technologies.
Comparison of adaptive streaming technologies.

<table>
<thead>
<tr>
<th>Name of the technology</th>
<th>Microsoft</th>
<th>Adobe</th>
<th>Apple</th>
<th>Google</th>
<th>MPEG/ISO</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIS Live Smooth streaming</td>
<td>HTTP Dynamic Streaming (HDS)</td>
<td>HTTP Live Streaming (HLS)</td>
<td>WebM</td>
<td>MPEG DASH</td>
<td></td>
</tr>
<tr>
<td>Streaming protocol</td>
<td>HTTP</td>
<td>HTTP</td>
<td>HTTP</td>
<td>HTTP</td>
<td>HTTP</td>
</tr>
<tr>
<td>Media container.</td>
<td>PIFF based on MP4 format</td>
<td>MP4</td>
<td>MPEG-2 TS</td>
<td>Matroska</td>
<td>MP4 fragments + MPEG-2 TS</td>
</tr>
<tr>
<td>Index file.</td>
<td>XML (Manifest)</td>
<td>F4M</td>
<td>M3u8 or M3u</td>
<td>No chunk</td>
<td>MPD</td>
</tr>
<tr>
<td>Video codec.</td>
<td>H.264, VC1</td>
<td>H.264</td>
<td>H.264, VP6</td>
<td>VP8</td>
<td>H.264+others</td>
</tr>
<tr>
<td>Audio codec.</td>
<td>AAC, WMA</td>
<td>AAC, MP3</td>
<td>AAC, MP3</td>
<td>Vorbis</td>
<td>AAC+others</td>
</tr>
<tr>
<td>Audio/video content muxed to a file.</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes, different bitrates are muxed</td>
<td>No</td>
</tr>
<tr>
<td>ABR Management.</td>
<td>Client</td>
<td>Client</td>
<td>Client</td>
<td>Server</td>
<td>Client</td>
</tr>
<tr>
<td>DRM.</td>
<td>Open</td>
<td>Adobe Proprietary</td>
<td>Open</td>
<td>Widevine</td>
<td>Flexible</td>
</tr>
</tbody>
</table>
iDEA

solution hosting.
Cisco videoscape architecture.
Takeaways.

- Next Generation Internet
- It is all about QoE
- Any network, any content, any device, any time – the 4 anys
- Multiple profiles and resolutions – ABR
- Distributed architecture to limit unicast HTTP transfer impact
Remember.
Thank you!