Towards Video on the Web with HTML5

Dr. Philipp Hoschka
Deputy Director for Europe, W3C

This work is part of the Open Media Web project supported by the European Union's 7th Research Framework Programme (FP7)
W3C

• Founded and directed by Tim Berners-Lee
• Consortium, 330 members (Alcatel, AT&T, BBC, DT, Ericsson, Google, Orange, LG, Microsoft, Nokia, Samsung, Vodafone, …)
• Key features
  – The Web standards body
  – International, not regional
  – “One Web”
  – Cross community (Web, Mobile, … TV?)
• Standards: HTML5, SVG, XML, Semantic Web, VoiceXML, Web Services …
Introduction

• Video traffic on Internet
  – quickly rising
  – expected to dominate soon

• HTML5 “video” tag
  – Not a standard yet
  – Still: Supported in most desktop browsers
  – Enables innovative Web UIs without plugins
Before HTML5

• Video Plug-ins
• “Black Box” for Web developer
  – No CSS transformations
  – No SVG masks
  – No standard Javascript API
• Plug-ins often “desktop only”, missing on mobile devices, TVs, …
Video Tag

CSS Transform in Firefox

Video player in SVG in Firefox
Codecs and Containers

• Any codec can be used in HTML5
• Alternate versions via fallbacks
• No standard codec
  – H.264 Baseline: IE9, Safari, Google Chrome
  – Theora: Firefox, Google Chrome, Opera
  – VP8: Google Chrome, Opera
• Issue: License fees
  – H.264 has fees
  – Theora, VP8 are free, but “fear of the unknown”
Web Streaming Video

• HTTP Progressive Delivery
• Advantages
  – Regular HTTP server
  – Passes firewalls
  – Can leverage Web CDNs
• Disadvantages
  – Jump forward/backward hard for long videos
  – Sudden lower bandwidth can stop stream
HTTP Streaming

- Protocol enables jump forward/backward
- W3C: Media Fragments URI
  http://www.example.com/example.ogv?t=10
- Needs simple extension of HTTP server
- Sudden lower bandwidth still stops video
HTTP Adaptive Steaming

- Essential to deliver video to
  - TV: primary focus is media delivery, no "stopped video"
  - Mobile: Bandwidth can quickly change

- Idea
  - Use HTTP
  - Split video into 2-10 second chunks
  - Encode at varying bandwidths
  - Client receives manifest file describing available segments
  - Downloads one segment using normal HTTP
  - Bandwidth next segment chosen on performance of previous one

- HTTP Live streaming, IIS Smooth Streaming, Adobe, 3GPP Adaptive Streaming, ...
P2P Video on Web

- HTML5 Websocket API
  - Clients connect via Web server rather than directly
  - Text frames only
- HTML5 “HTML Device” for “proper” P2P
- Not limited to HTTP
  - H.264 SVC (Google Gmail video chat)
  - MDC
Future

• Web on TV and Set-Top Boxes
  – Richer user interfaces with HTML5
  – Device APIs: Geolocation, Calendar, Media Capture, Contacts, …)
  – Package video applications in W3C widgets
  – More APIs needed: TV channel being watched, …
  – W3C workshop: W3C will start TV group

• Consolidation of HTTP Streaming

• P2P Video on the Web
  – Video conferencing
  – Network games
Getting Involved

• Join W3C!
  – The Web standards body
  – International, not regional
  – “One Web”
  – Cross community (Web, Mobile, … TV?)

• Participate/follow working groups

• New group on TV to start soon!

• Likely topics
  – DRM
  – TV-related Device APIs
  – Hyperlinks in video content
  – Interaction with mobile, home network
  – TV-related feedback on other W3C specs
  – …

• Contact: ph@w3.org

This work is part of the Open Media Web project supported by the European Union's 7th Research Framework Programme (FP7)