



# Towards Video on the Web with HTML5

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# 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

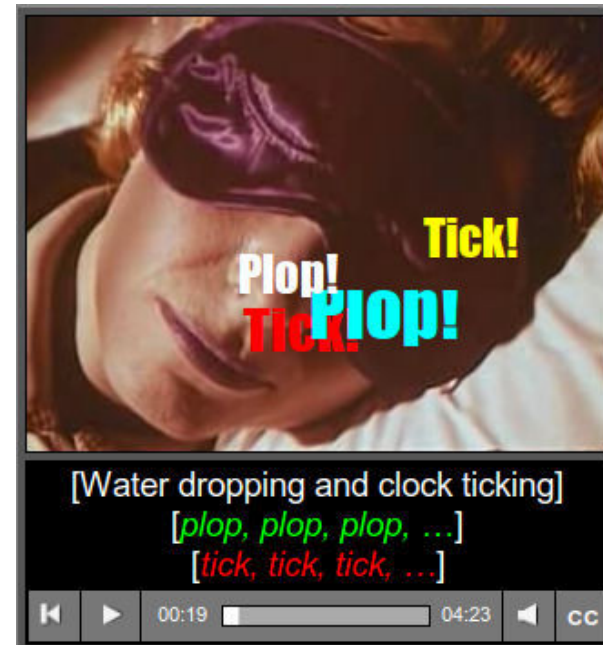


- Video Plug-ins
- “Black Box” for Web developer
  - No CSS transformations
  - No SVG masks
  - No standard Javascript API
- Plug-ins often “desktop only”, missing on mobile devices, TVs, ...

# 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](mailto:ph@w3.org)

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