

Technical Trends in Video Streaming

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State of the Industry

Video Streaming Trends

Options for viewing video will continue to grow

- Mobile
- Computer
- Smart TV
- TV appliances and game consoles

Bandwidth availability will continue to increase

- Cable and phone providers → IP networks in the home
- Mobile/Wireless network bandwidth is increasing
- Line between cable and phone service is blurred:
 - Buy phone from cable company
 - Buy TV from phone company

State of the Industry

Video Streaming Trends Cont'd

Streaming on-demand content is becoming common place

- Even Walmart has video streaming (Vudu)

Video content management and distribution has been commoditized

- Multitudes of vendors can store and stream video
- Content is available live and on-demand

Video Streaming feature set is still expanding

- Live rewind will be the norm soon
- HTML5 will usher in a new generation of web applications that use video
- Content is becoming more accessible:
 - Text search
 - Content search (image recognition)
- Devices to view streaming video are constantly expanding beyond the computer

What Government IT Needs to Know

Windows Media is on its way out

The technology has peaked

Has limited applicability in the future

- Still works on Windows and Mac
- Doesn't work for mobile
- Doesn't support adaptive bit-rate streaming
- Doesn't work with modern HTTP distribution networks

Rapidly being replaced with newer, more web-friendly streaming protocols & CODECs



What Government IT Needs to Know

Standardized CODECs

Current CODEC leader: H.264/MPEG-4 AVC

- Moving Picture Expert Group (MPEG)
 - High compression ratio
 - Supports high-definition bit rates
 - Used across all segments of the market
 - Broadcast, DVD/BlueRay, set-top, smart TV, computer, mobile
 - Subject to licensing terms under MPEG-LA
 - Pay for H.264 encoding and decoding



What Government IT Needs to Know

H.264's competitor on the horizon

Google's VP8

- Quality/compression ratio comparable to H.264
- Open Source
- No licensing or fees
- Limited industry support



Companies committed to supporting this CODEC

- Most notably, Adobe

Rapidly gaining open source hardware support

What CODEC will Become the Standard?

The battle will be fought using:

- Licensing, patents, delivery platforms, and content availability

Google will exert downward pressure on H.264

- No licensing fees for consumers or vendors
- Strong support on the most widely distributed mobile platform (Android)
- Google will drop H.264 support from Chrome browser
- Chrome will support VP8 in HTML5

What CODEC will Become the Standard?

H.264 patent holders will defend market position:

- Licensing exceptions for certain uses
 - Internet vs broadcast
- Restrict use of VP8 on devices
 - Apple & H.264
 - IE9 & Safari - H.264 in HTML5
- Dynamics are constantly changing



The winner will ultimately be determined by consumers

Streaming Protocols

The Future of Video Streaming

Adaptive Bitrate Streaming over HTTP

- Dynamically adjusts size of content based on available bandwidth
- Delivered over HTTP
- Leverages existing HTTP content distribution networks

Available options

- Microsoft Smooth Streaming
- Adobe HTTP Dynamic Streaming
- Apple HTTP Adaptive Bitrate Streaming
- More will come

How Does this Affect IT Decisions?

Government content won't be subject to H.264 licensing restrictions

H.264 vs VP8: Quality & compression ratios are virtually the same

Streaming protocol will depend on the device's vendor to access content

Your decision will be based on audience reach:

- Number of accessible platforms for your content
- Mobile: iPad vs Android
- Computer: Linux vs Windows vs OS X

How Can You be Prepared?

Stay neutral in the battle of CODECs

Make wise investments

Choose responsible vendors that ensure the broadest reach

- Should be aware of current and future trends
- Should be capable of moving content between formats to ensure accessibility

Trends for Streaming Video for Gov

Government content generally fits into one of three categories

- Informational: news
- Instructional: training
- Historical: meetings

Watching government video content from beginning to end rarely makes sense

Moved from long-format viewing towards interactive, multi-media presentations



Make Video Invaluable

Value is derived from viewers' ability to quickly & efficiently access the information they need

Videos should be:

- Indexed videos
- Documents - cross-linked to video
- Meta data
- External, supporting links
- Searchable
 - Multiple ways to find content
 - Topics, keywords, spoken word

The screenshot displays the 'THE COLORADO CHANNEL' website interface. At the top, there is a navigation bar with links: HOME, ABOUT US, LIVE BROADCAST, ARCHIVED SESSIONS, ADDITIONAL CONTENT, DONATE NOW, GET INFORMED, CONTACT US. Below this is a banner for 'LIVE & REPEAT COVERAGE OF THE STATE LEGISLATURE'. The main section is titled 'SENATE ARCHIVE' and features a search bar labeled 'Search Archives: Enter Keywords here' with a 'Search' button. To the right of the search bar are links for 'Subscribe via RSS feeds', 'Calendar | Journal', and 'What are RSS Feeds?'. Below the search bar is a table of 'Archived Videos' with columns for 'Name', 'Date', and 'Duration'. The table lists several legislative days from 2011, each with a 'Documents...' dropdown menu, a 'Video' link, and a 'Download' link. A yellow arrow points from the 'Documents...' dropdown of the first row to a document viewer window. The document viewer shows a search results page with a list of bills, including HB111208 and HB111092, and a detailed view of a resolution concerning the designation of a portion of State Highway 104 as 'Major Engineer William J. Crawford Highway'.

IT Decision-Makers

Consider your audience:

- How your content will be viewed?
- Watching video from beginning to end or watching specific sections?

Make content useful for your audience

- Does the video stand on its own or is there supporting information that should be presented with the video?
- Does it need to be searchable?

