

Debunking HTML5 Video Myths: A Guide for Video Publishers

by Robert Reinhardt



After Steve Jobs announced the iPad, a whole new round of anti-Flash sentiment swept the ranks of the online design and development community. Many claims have been laid down by both “standards” and Flash proponents, and not all of them are based on fact. This session walks you through the potential capabilities of HTML5, the differences across browsers, and how they compare to those of the Flash platform. Learn the effect HTML5 will have on video encoding and distribution in the future and how HTML5 may impact your business.

- **email:** robert@theMakers.com
- **twitter:** @flashfreaker

hash tag for this event:

#SMWest10

Flash and Online Video Expertise



Robert Reinhardt, VP of [theMAKERS]

- **Creator:** Developer, solutions architect for Flash platform
- **Writer:** original *Flash Bible* series, *Video for Flash Studio Techniques*
- **Instructor:** Corporate training for Disney, global design agencies
- **Entrepreneur:** Online video services at videoRx.com
- **Contributor:** Online articles, calculators, tutorials.



Situation Normal: **All Fouled Up**

Virtually no consistency from
one browser to the next.

Important: Always answer these questions upfront

- **Who is your target audience?**
 - Desktop?
 - Mobile? Which devices?

Important: Always answer these questions upfront

- **What resources are available?**
 - Does the project have a budget to accommodate multiple deployment strategies?
 - What personnel are available to complete the tasks?

Important: Always answer these questions... for video too!

- **Who is your target audience?**
 - Desktop?
 - Mobile? Which devices?
 - Targeted connection speeds

Important: Always answer these questions... for video too!

- **What are your encoding options?**
 - Existing resources with business client?
 - Storage restrictions?

Important: Always answer these questions... for video too!

- **What are your deployment requirements?**
 - Standard HTTP hosting only?
 - Existing CDN architecture?
 - Content protection?

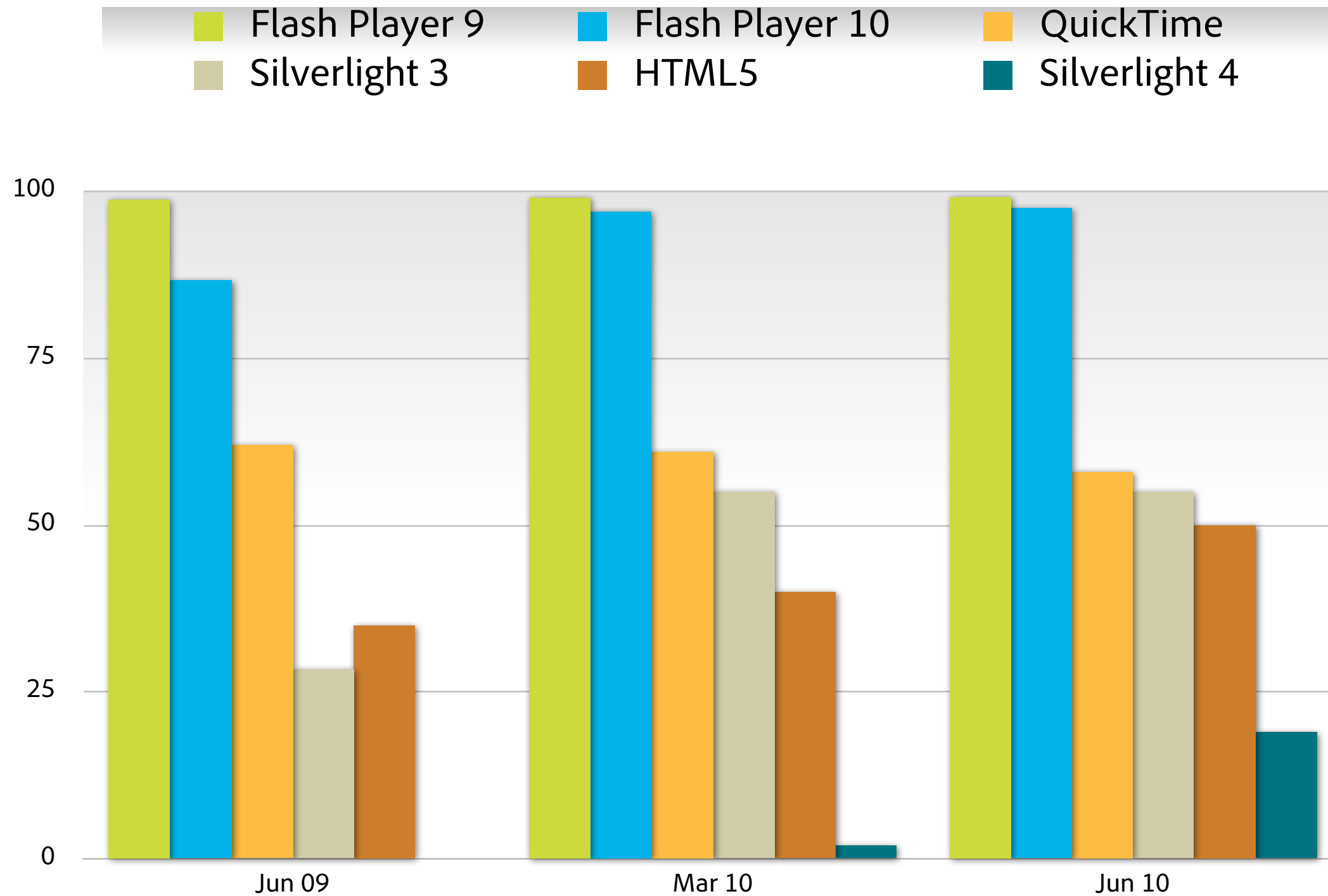
- **ACCURATE:**

- “I want to reach desktop browsers and iDevices.”

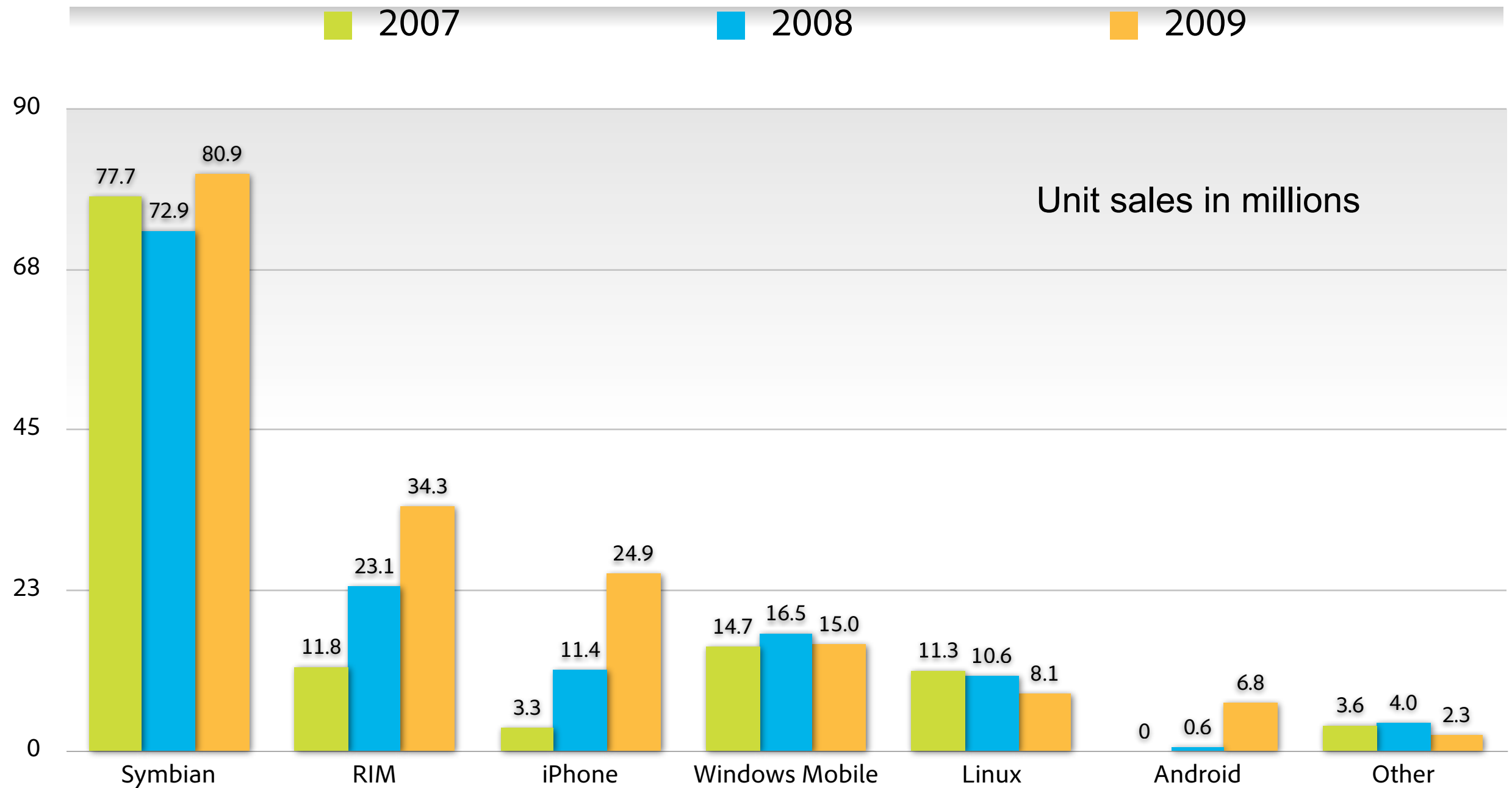
- **INACCURATE:**

- “I want to reach HTML5 audiences.”

Adoption statistics



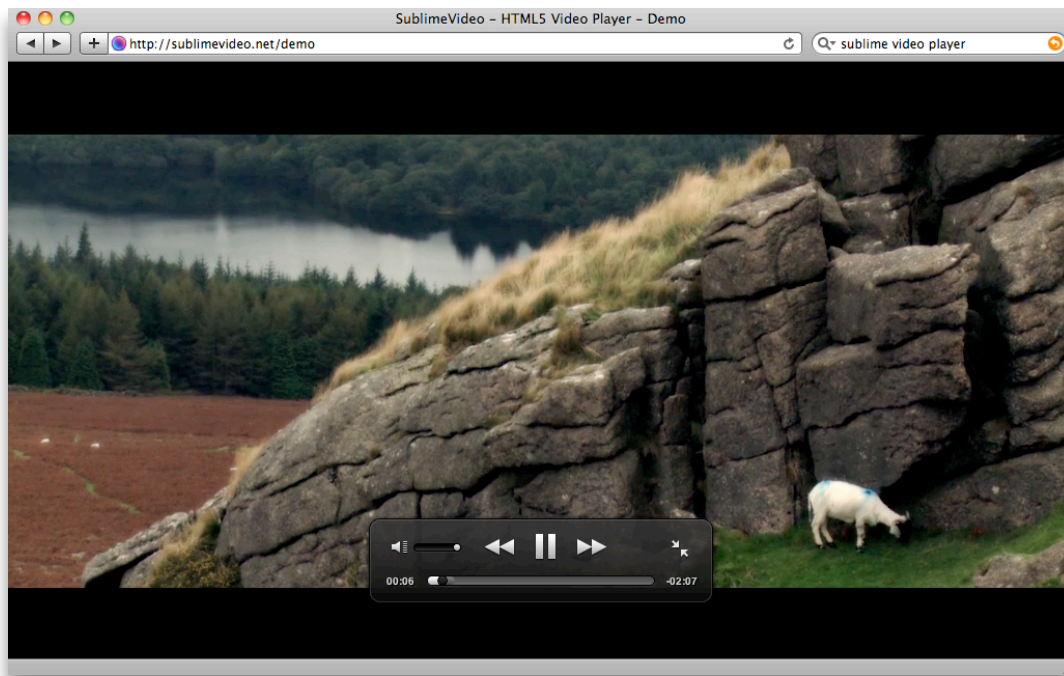
Smartphone OS Market Share



Source: GigaOM <http://gigaom.com/2010/03/18/the-mobile-os-market/>

Video capabilities

- **Full screen:** Not consistently available in HTML5

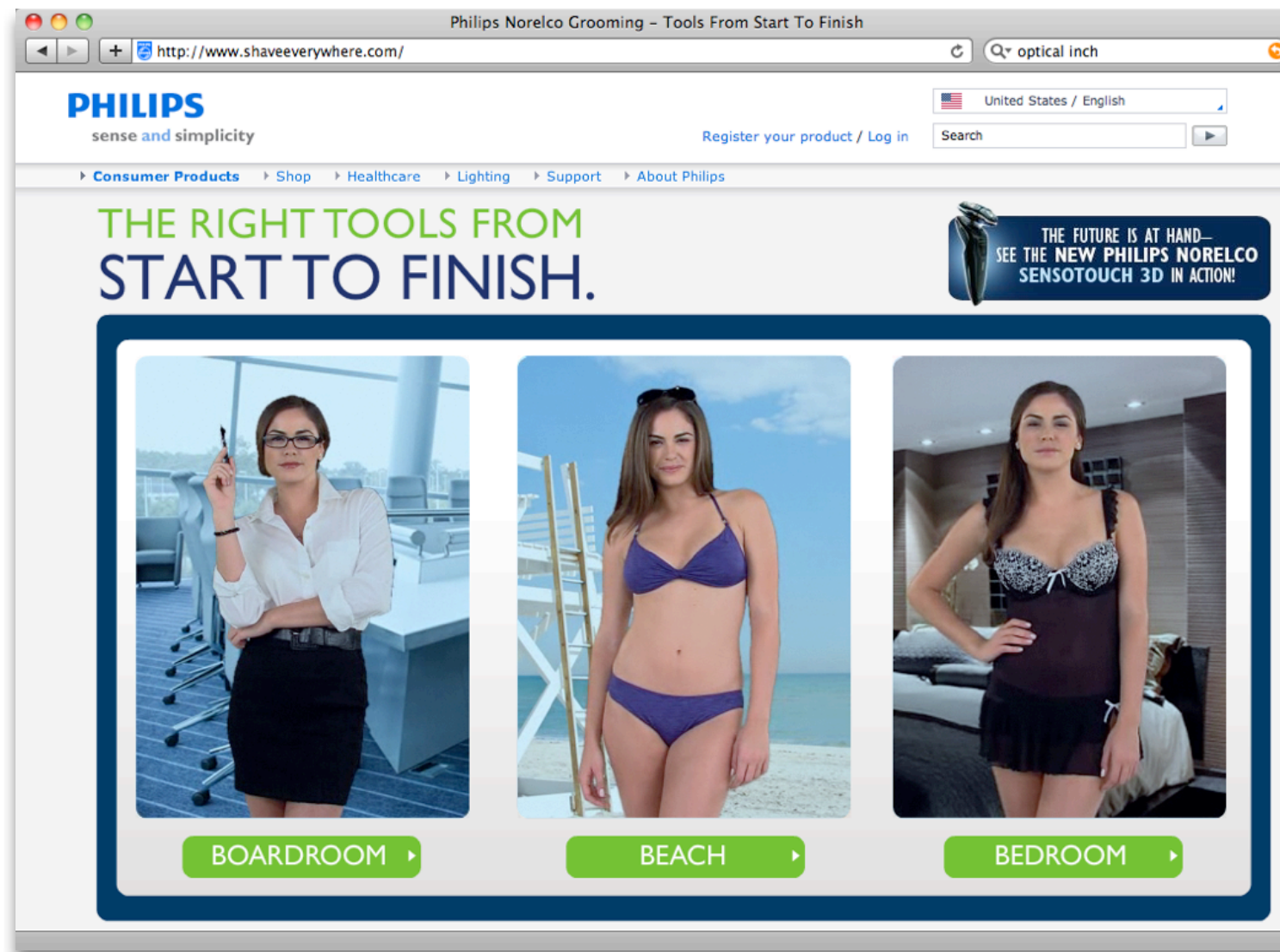


HTML5 “fullscreen”



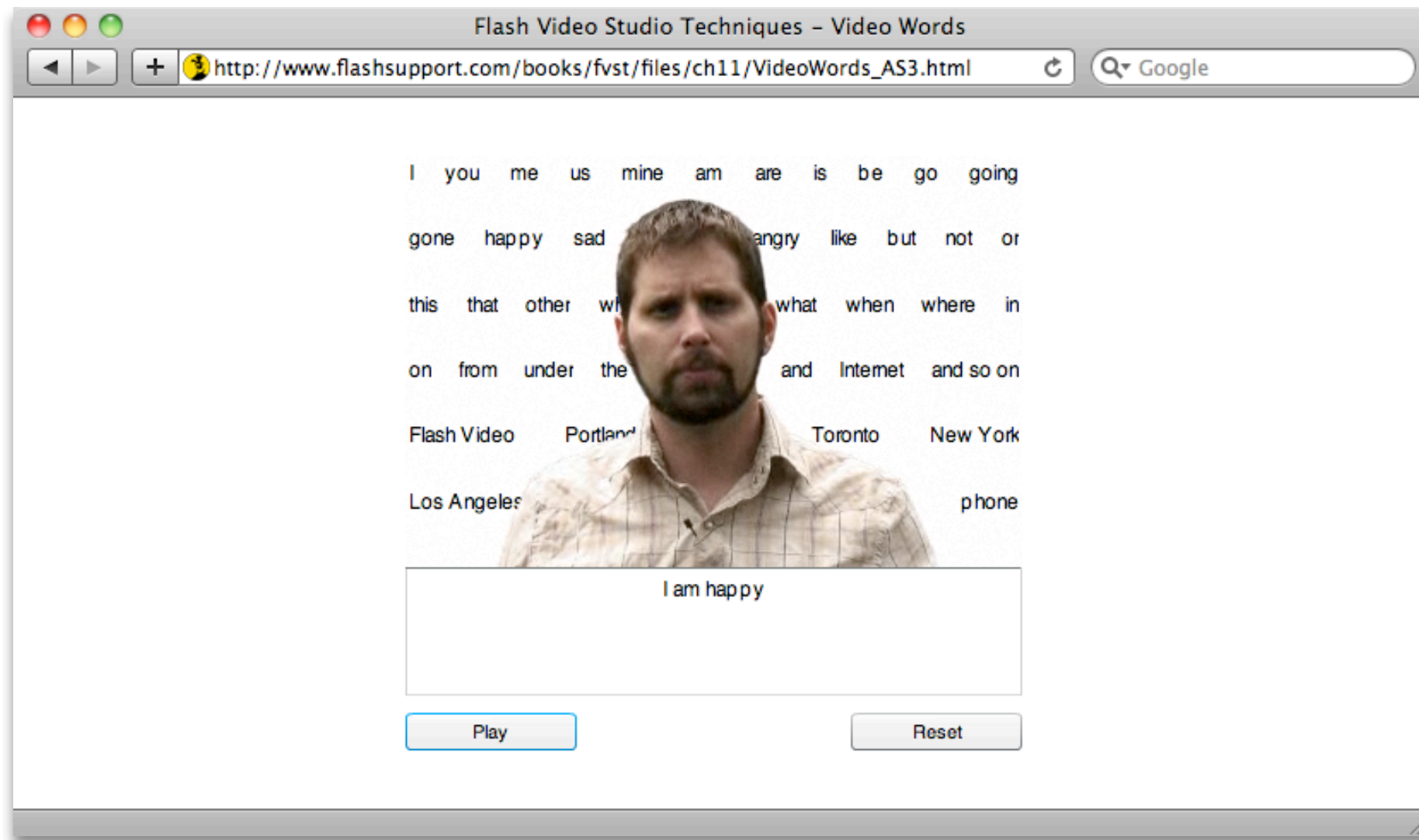
Flash Player “fullscreen”

- **Alpha channel mask:** Available in VP6, Adobe Flash Player (2005)



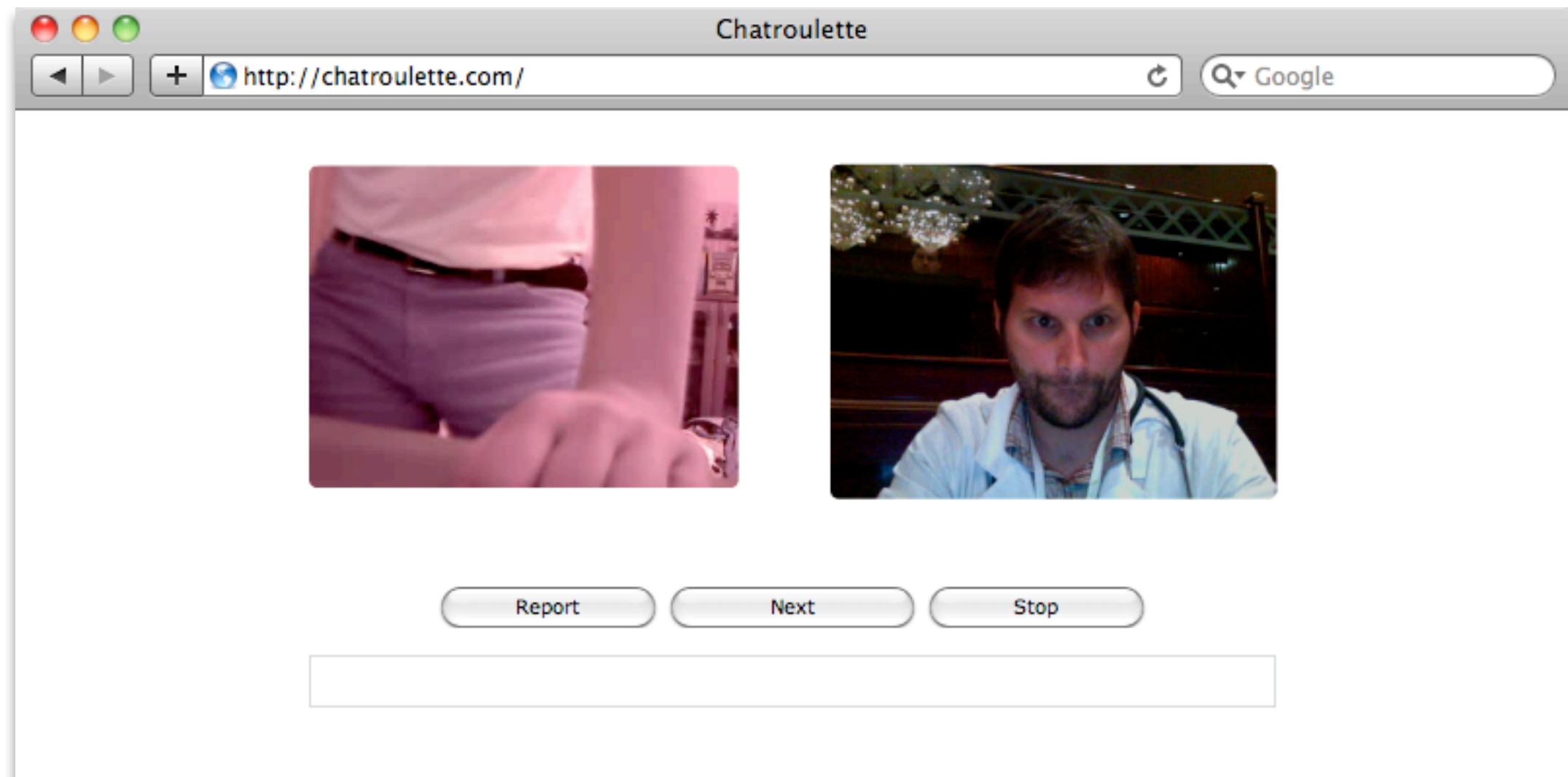
Video capabilities

- **Embedded cue points:** Available in FLV, Adobe Flash Player (2003)



Video capabilities

- **Web cam/mic access:** Available in Flash Player 6+, Silverlight 4



- **Cross-domain access:** HTML5 spec dictates access policy *in response header!* (not currently implemented in browsers)
- **Uninterruptible playback:** Silverlight, Flash Player, HTTP Live Streaming
- **Near-instant seek:** Any streaming/adaptive protocols
- **Video slicing:** Silverlight, Flash Player
- **DRM:** Silverlight, Flash Player 10.1 (Flash Access)
- **Live streaming:** Silverlight, Flash Player, HTTP Live Streaming

- **And let's not forget the available workforce...**
 - Flash designers and developers have been working with video since 2002 in real-world scenarios.
 - HTML5 developers are just starting.

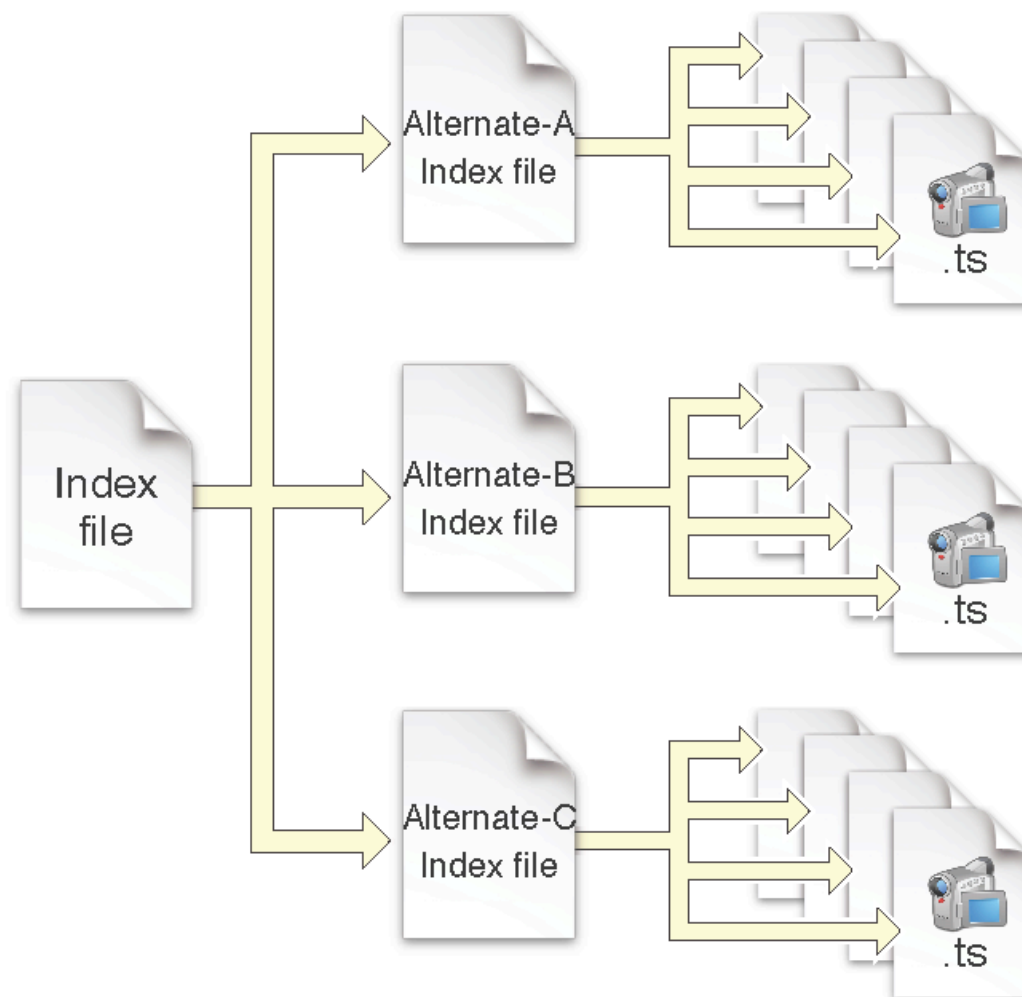
Protocols for online video

- **HTTP:** Standard web protocol for progressive download video
 - HTML5 <video> tag
 - Adobe Flash platform, Microsoft Silverlight, and other runtimes
- **HTTPS:** Standard web protocol for encrypted video, keys
- **RTMP:** Real Time Media Protocol for audio, video, data
 - Adobe Flash Media Server, 3rd party servers (Wowza, Red5, etc.)
 - Adobe Flash Player, AIR, Flash Lite
- **RTSP:** Real Time Streaming Protocol for audio, video
 - Apple QuickTime
 - Microsoft Media Server
 - Real Systems Real Video

Codecs and containers for online video

- **MPEG-4:** AVC/H.264 and AAC variants
 - Several video profiles: Baseline, Main, and High
 - Several audio profiles: AAC-LC, AAC Main, HE-AAC
 - Support for profiles varies by HTML5 browser, platform, and device
 - Different container types: MP4/M4V, MOV, and F4V
- **FLV:** On2 VP6, Sorenson Spark, and MP3
 - Supported by Adobe Flash platform
 - Limited support in newer versions of Apple QuickTime
 - Supports embedded cue points (all variations), alpha channel (VP6)
- **WebM:** On2 VP8 and Vorbis
 - Announced at Google I/O conference as the next web video standard
 - Support in development builds of Chrome/Chromium, Firefox, and Opera
 - Adobe and Microsoft already on board

Adaptive HTTP Streaming: What is It?



Source: Apple HTTP Live Streaming Overview PDF

Adaptive HTTP Streaming: Why It Matters

- **Cacheable video segments:** Edge networks can cache video fragments and lessen network load on origin server
- **Firewall pass-thru:** HTTP delivered chunks not likely to be blocked by tight firewalls
- **Reduced server requirements:** Many adaptive HTTP streaming technologies can be deployed to any web server.
- **Reduced wait times:** Faster start, faster seek
- **Dynamic switching between bitrates:** Playback is near uninterrupted with bandwidth sensing on the client

Adaptive HTTP Streaming: No Consistent Approach

■ **HTML5**

- Manifest specifications are in the W3C spec
- No current HTML5 browser has a “standard” implementation
- Apple has an approach, but only Safari Mac supports it

■ **Adobe Flash Player**

- Available on desktop as a solution (via RTMP in 10.0, HTTP in 10.1)
- Available in Flash Player 10.1 mobile devices

■ **Microsoft Silverlight**

- Available on desktop as a solution
- Easiest deployment requires Microsoft IIS7 as web server

- **Wowza Media Server: All-in-one solution**

- Supports adaptive RTMP (Adobe Flash)
- Supports adaptive HTTP (Apple iOS, Microsoft Silverlight)
- Available as a standalone license, or as an Amazon EC2 service
- Will be available from videoRx.com in late 2010



Encoding guidelines for adaptive streaming video

- **Consistent keyframe interval**
 - Shorter intervals = faster switching, but at reduced quality
 - Don't exceed 10 seconds, but it is the default
- **Consistent audio settings**
 - Same sampling rate (kHz) across all bitrates
 - Same bitrate per channel (48 Kbps mono, 96 Kbps stereo)
 - Downmix to mono from stereo on lower bitrates

- **Mark every keyframe (i-frame) as IDR frame**
 - IDR frames are a complete refresh of the video frame
 - Adaptive segments won't work without IDR frames

My current proposal for optimal HQ viewing experience

■ “Flash first” approach:

- If Flash Player 10 or higher is available for host environment, play video via adaptive RTMP streaming
- Or, if iOS or Safari Mac w/o Flash Player, show Apple HTTP Live Streaming video
- Or, default to H.264/WebM progressive download in supported browsers

■ Requirements:

- OSMF compatible SWF player (Strobe Media Player, Flash Media Playback)
 - SMIL manifest for H.264 bitrates for iOS <video> HTTP streaming (Wowza Media Server)
 - F4M manifest for H.264 bitrates for Flash Player RTMP streaming
 - Progressive downloads for H.264 and WebM media
- Current prototype: <http://videorx.com/play.php?id=5RN8N>

My current proposal for optimal HQ viewing experience

<video

id="videoPlayer"

width="640"

height="480"

controls >

<!-- None of the options below will be used if Adobe Flash Player 10.0 or higher is installed. -->

<source src="<http://hosted.videorx.com/vod/smil:manifest.smil/playlist.m3u8>" />

<!-- Progressive H.264 download for Safari, Chrome, IE9, Main Profile Level 3.1 -->

<source src="http://s3.videorx.com/h264_video.mp4" type="video/mp4;

codecs='avc1.4D401F, mp4a.40.2'"/>

<!-- Fallback to WebM on non-H.264 compatible browsers -->

<source src="http://s3.videorx.com/webm_video.webm" type="video/webm" />

<!-- Download link for non-HTML5 browsers -->

<p>

Download the video for local playback.

</p>

</video>

My current proposal for optimal HQ viewing experience

```
var posterSrc = "http://s3.videorx.com/poster.jpg";  
var f4mSrc = "http://s3.videorx.com/manifest.f4m";
```

```
var flashvars = {  
    src: f4mSrc,  
    poster: posterSrc,  
    streamType: "recorded",  
    controlBarAutoHide: "true"  
};
```

```
var params = {  
    menu: "false",  
    allowscriptaccess: "always", // Change to "sameDomain" for final deployment  
    allowfullscreen: "true",  
    align: "tl",  
    bgcolor: "#FFFFFF"  
};
```

```
var attributes = {  
    id: "videoPlayer",  
    name: "videoPlayer"  
};
```

```
swfobject.embedSWF("StrobeMediaPlayback.swf", "videoPlayer", "640", "480", "10", "swfobject/expressInstall.swf",  
flashvars, params, attributes);
```


- **Better manifest specs:** F4M needs some indication of codec profile(s) in use.
- **Easier device targeting:** Reliance on JavaScript for HTML5 to properly specify video source.

get better video with prescription encoding

- Reduce the time to encode high quality video
- Provide the highest quality lowest file size video
- Trust video compression from a reputable source
- Enable adaptive bitrate encoding for everyone
- Enable easy and affordable hosting (end of 2010)



1. User uploads source file. (Resumeable uploader, AIR app)
2. Server analyzes source file for motion complexity. (C++)
3. Thumbnail video is created on initial video analysis.
(Encoding software)
4. User submits encoding job(s) until desired quality is reached.
(Encoding software)
5. User buys or hosts final encoded clip. (PayPal.com for credit purchases.)

thank you

- **email:** robert@theMakers.com
- **twitter:** @flashfreaker
- **survey:** <http://surveymonkey.com/s/encoding> (10 free credits!)
- **contribute:** <http://tinyurl.com/html5compare>
- **discount code:** 10% off Telestream Episode 6 or Episode Pro 6 with coupon code "TheMakers"
- **upcoming events:**
 - FITC Amsterdam: March 8-9, 2011
 - FITC Toronto: May 2-4, 2011