



WebM Open Video Playback in HTML5

Kevin Carle & James Bankoski, Google

Bob Mason, Brightcove

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Wave

View live notes and ask questions about this session on Google Wave:

<http://bit.ly/cvBgIn>

Kevin Carle, Software Engineer, YouTube



Agenda

- What is HTML5 <video>?
- Benefits of <video>
- Current state of <video> at YouTube
- What is WebM video?
- WebM <video> in YouTube
- WebM <video> in Brightcove
- <video> development experiences & findings
- Q&A

What is HTML5 <video>?

- HTML5 introduces media tags (<audio> , <video>)
- Media player is part of the browser - No plug-in
- Otherwise like any other tag

<video controls>

<source src="video.webm" type="video/webm"/>

</video>






- Codecs & Containers

Benefits of <video>

- Open source technology
 - Open source browser/player
 - Open source codec/container
- Lower Latency
 - Avoid plug-in instantiation
- Better, Smoother Performance
- Accessibility
 - User agents can have special video handling
- Semantics



Current state of <video> at YouTube

- HTML5 opt-in is at <http://www.youtube.com/html5>
- WebM videos available on search with &webm=1 parameter
- Browsers supported:
 -  Chrome (h.264 & WebM)
 -  Safari (h.264)
 -  Opera – soon (WebM)
 -  Firefox – soon (WebM)
 -  IE9 – (when <video> support exists)
- No support for advanced overlays (ads, annotations)
 - Caption support just added

Video at YouTube

- YouTube supports h.264 & WebM
- Both formats will be supported for new uploads
- H.264
 - All videos available
 - With MP4 container: 360p, 720p, 1080p
 - With FLV container: all formats
- WebM
 - New HD (720p and above) uploads will be in WebM
 - Later enabled for all new uploads
 - Transcoding existing videos over time
 - Currently available in 360p and 720p

What It Isn't...Yet: Adoption Hurdles

- Fullscreen
- Embedding (<iframe>, <object>, fallback issues)
 - <iframe> best option, but not always allowed
- Live streaming
- Stream management
- Content protection
- Implementations and spec still in motion
- No agreed on standard / ecosystem for ads

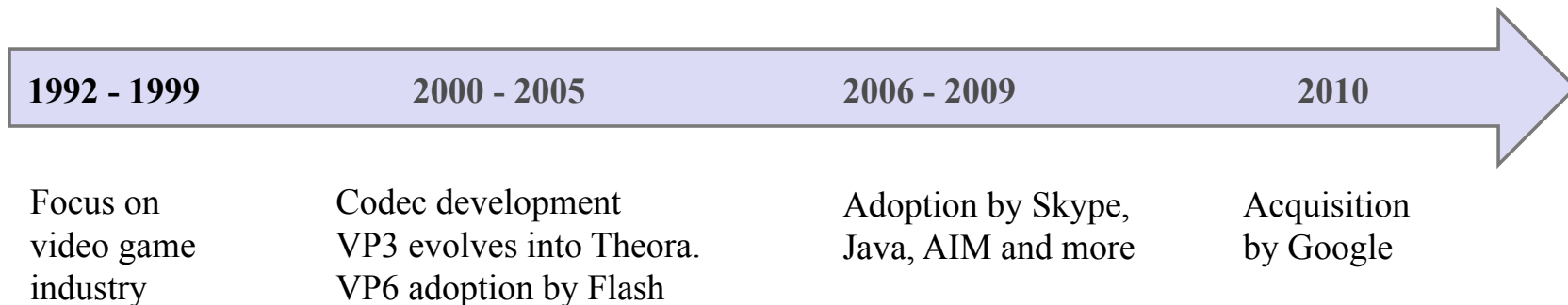


Jim Bankoski, Engineering Manager,
Google



On2: team and technology

- Pioneers in video codec technology
- 2B+ installs
- Optimized for the web



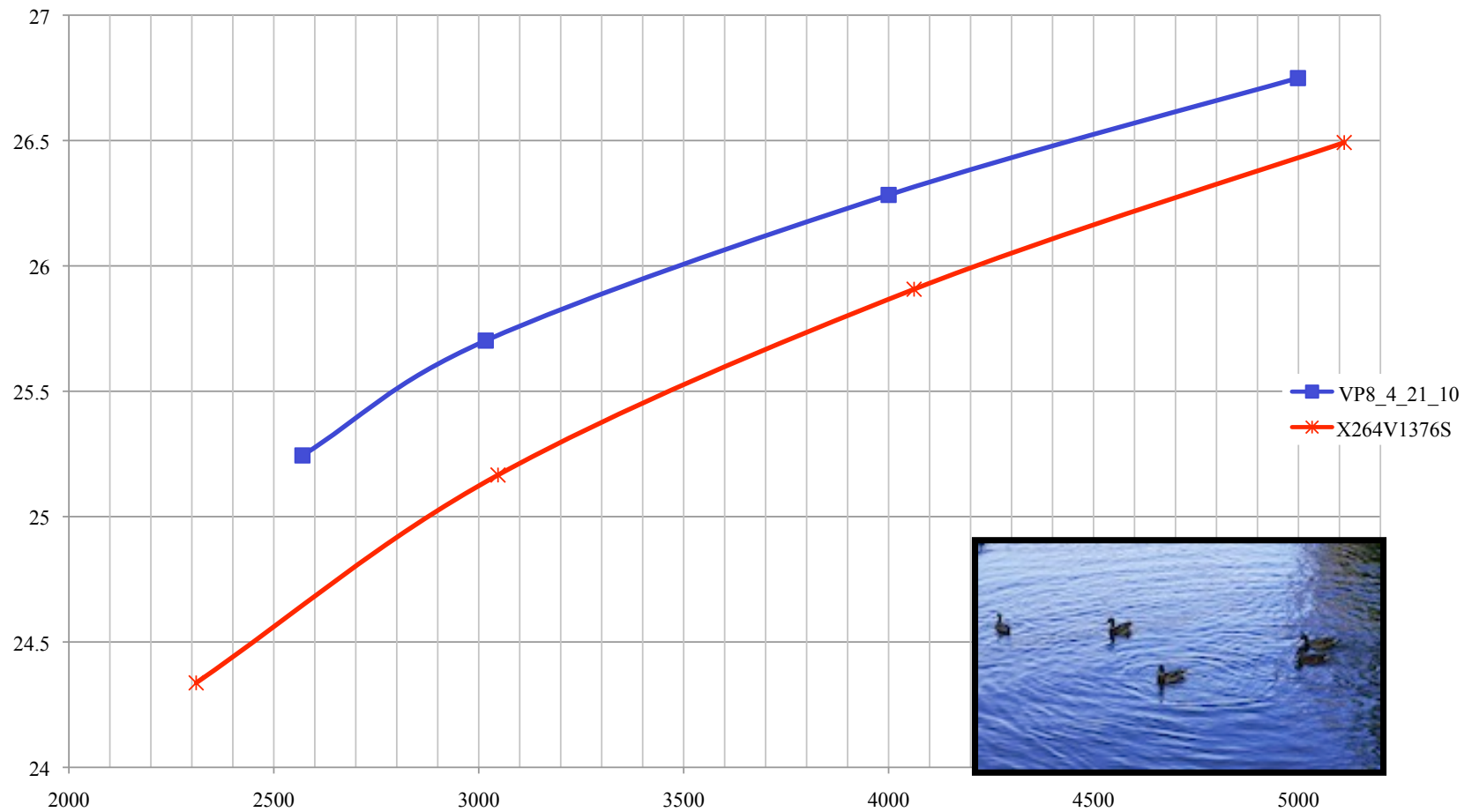
What is WebM Video?

- New video format optimized for the web
 - *(announced this morning in Sundar Pichai's keynote)*
- WebM is a Media Format with
 - VP8 video codec
 - Vorbis audio codec
 - WebM (a subset of Matroska)

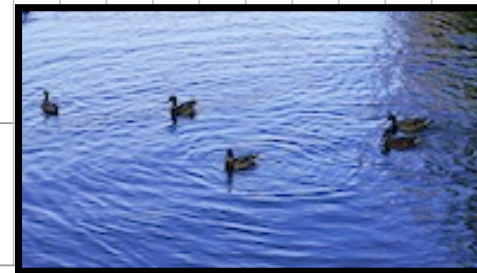
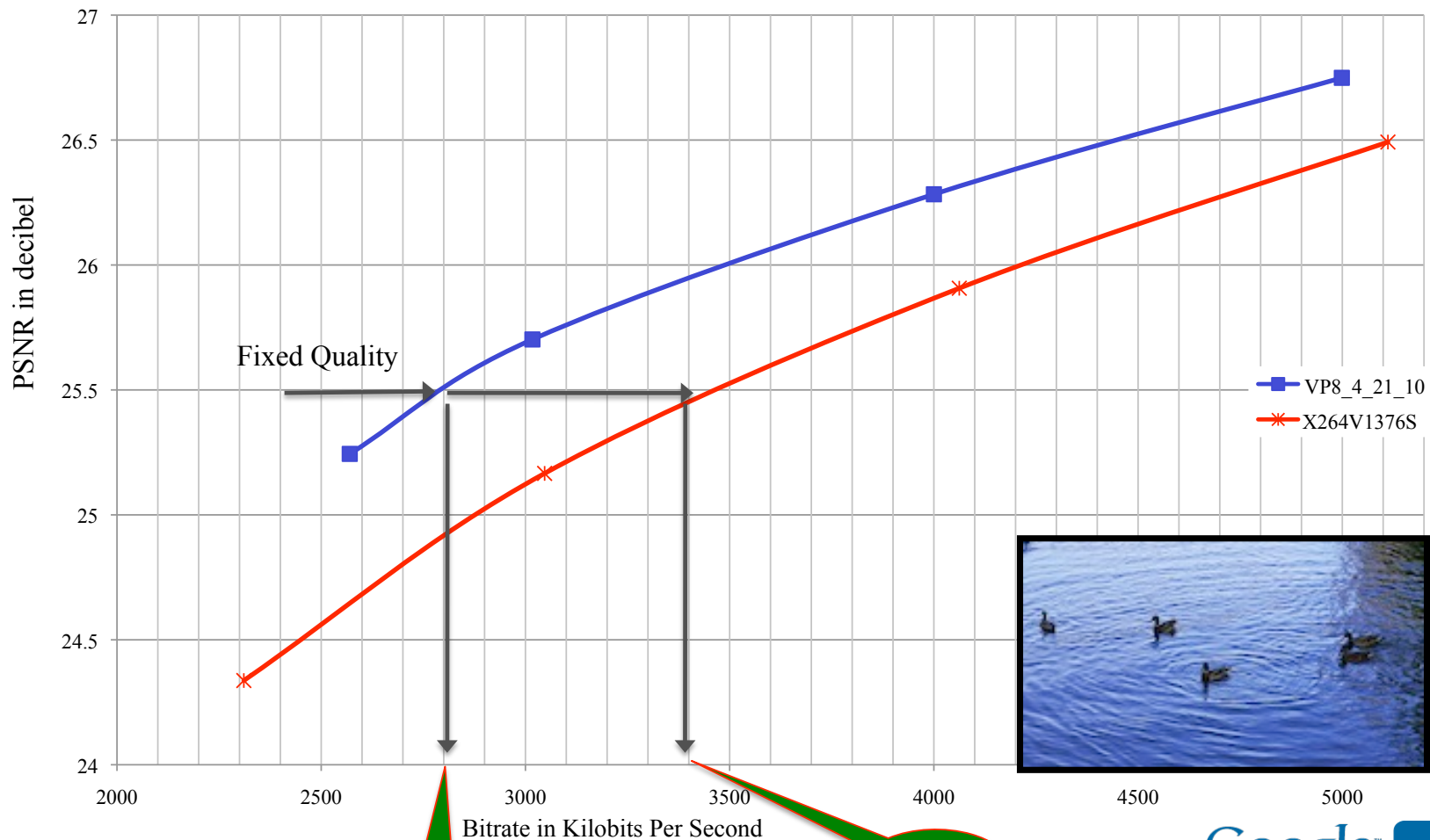
What's Great About WebM

- Video Quality
- Playback Performance
- Live / 2 Way Encoder Performance
- Openness
- Hardware Device support
- Content Creation Tool Support

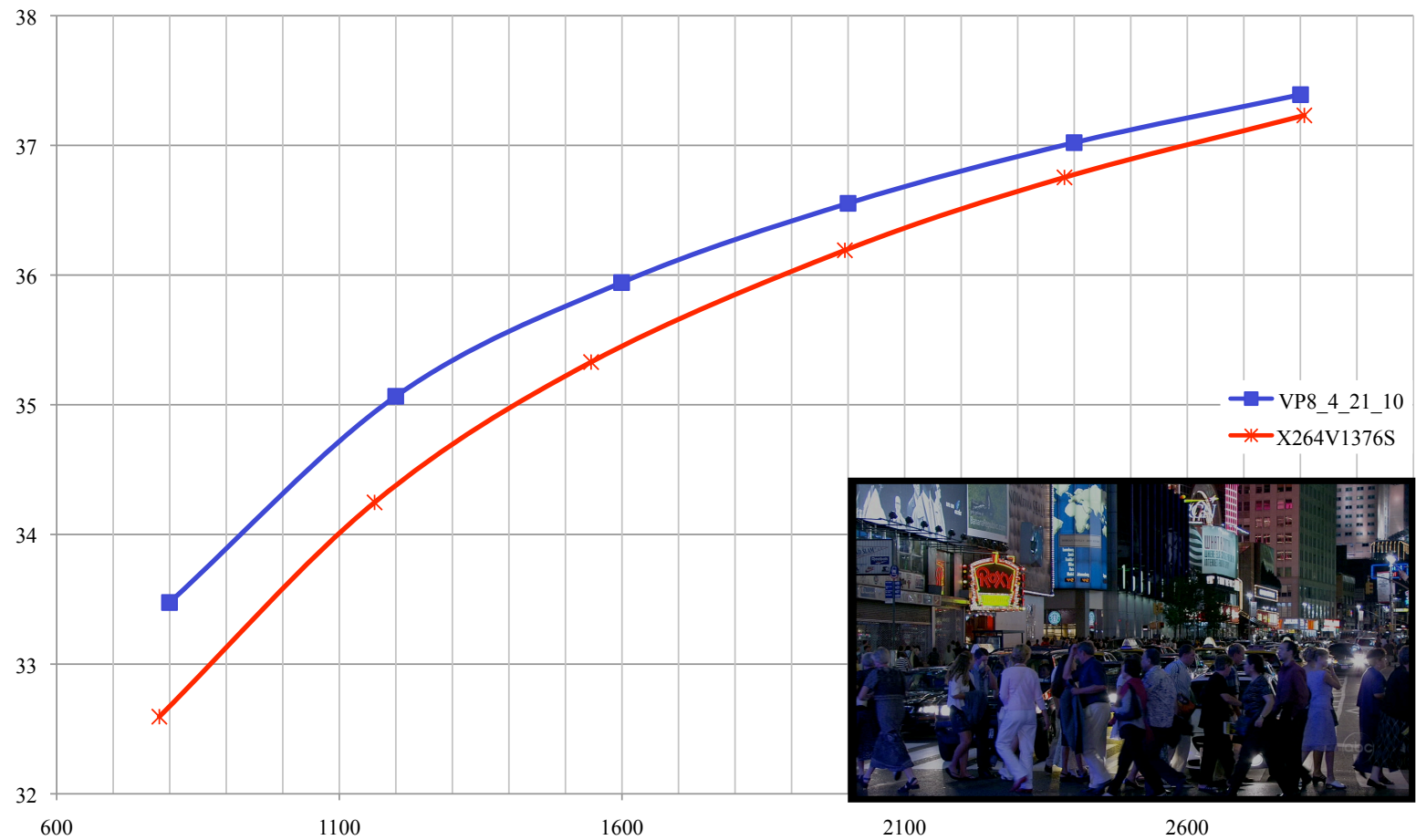
DucksTakeOff(1920x1080@50fps)



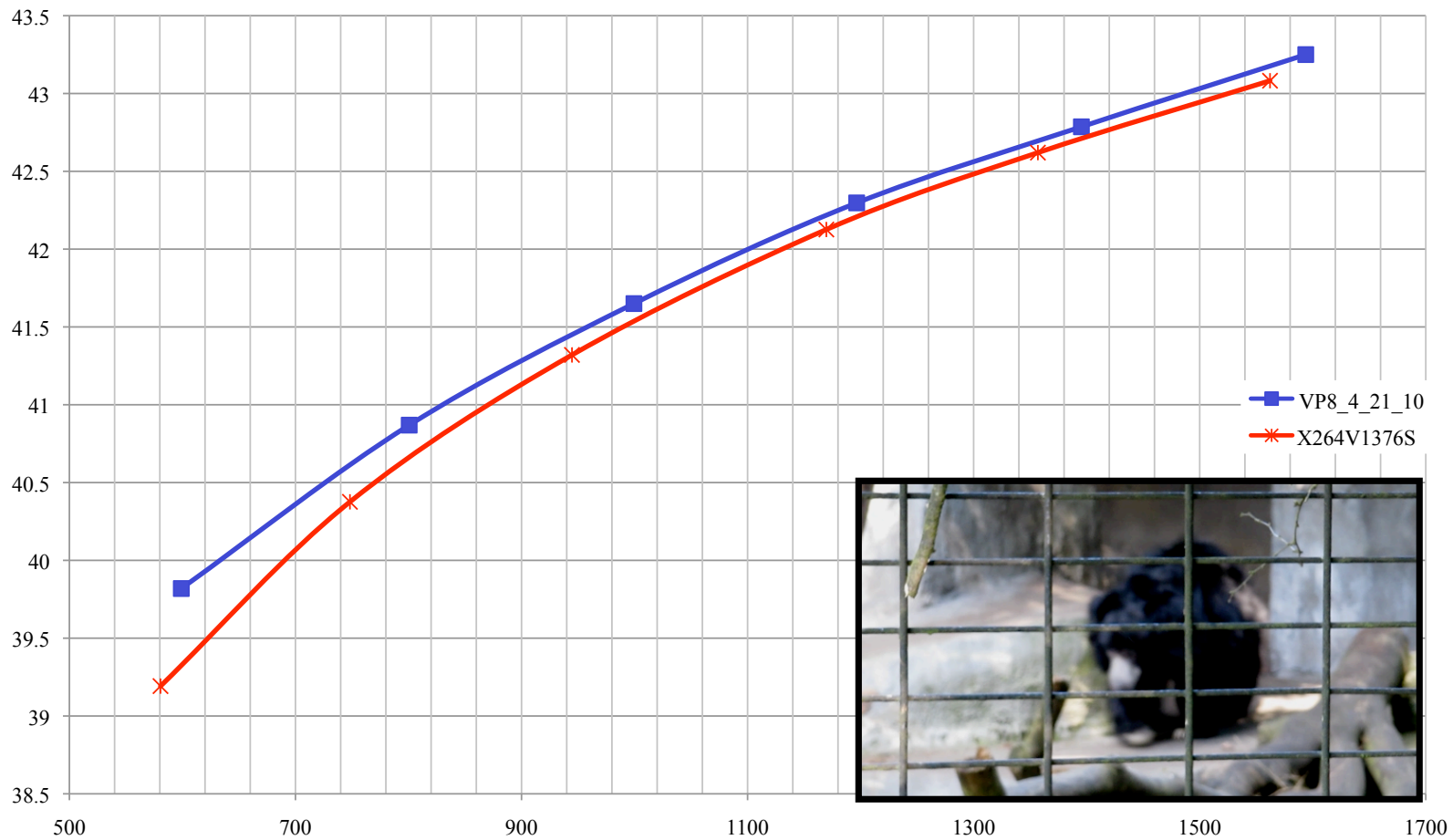
DucksTakeOff(1920x1080@50fps)



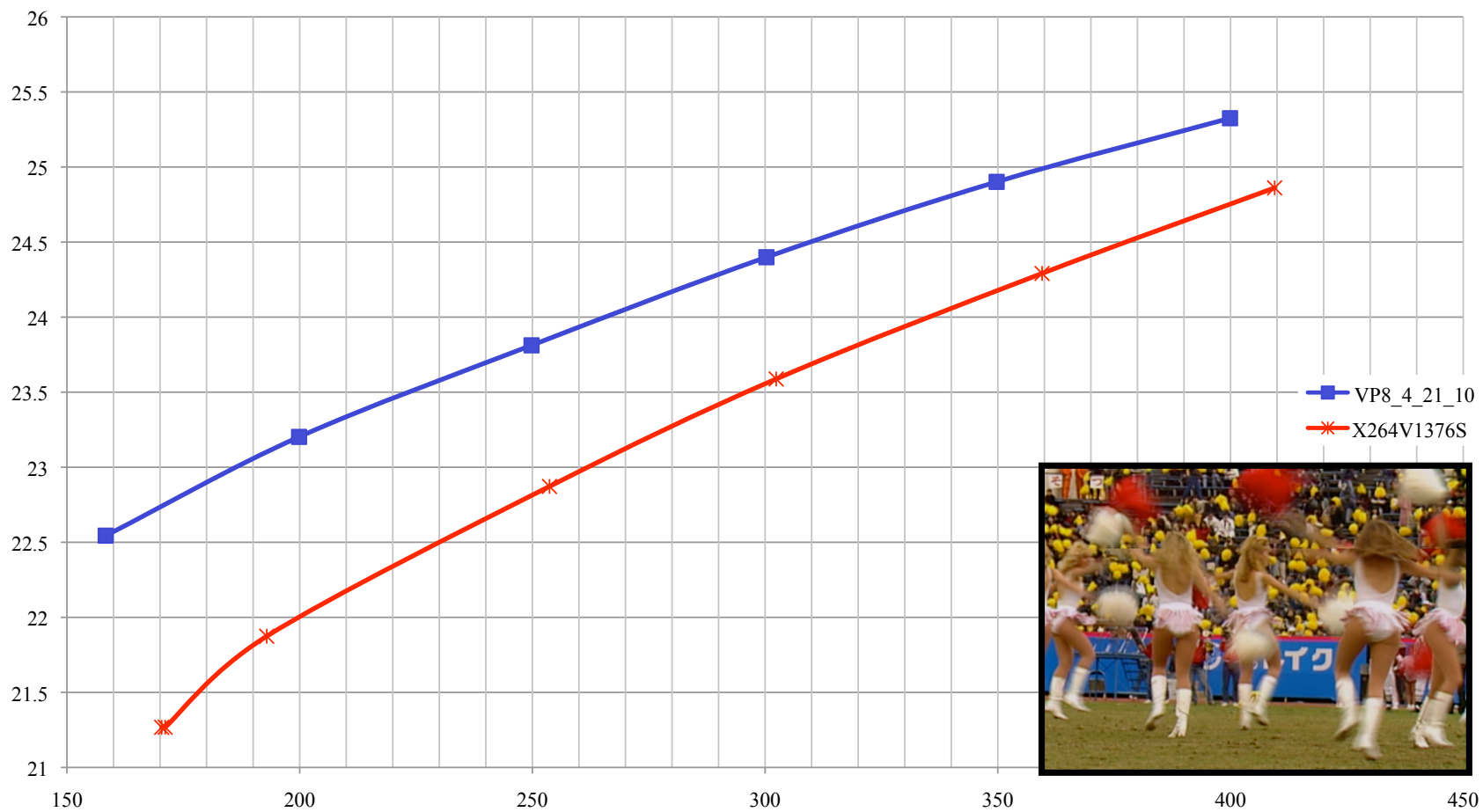
Night (1280x720@30fps)



Bear (640x360@30fps)



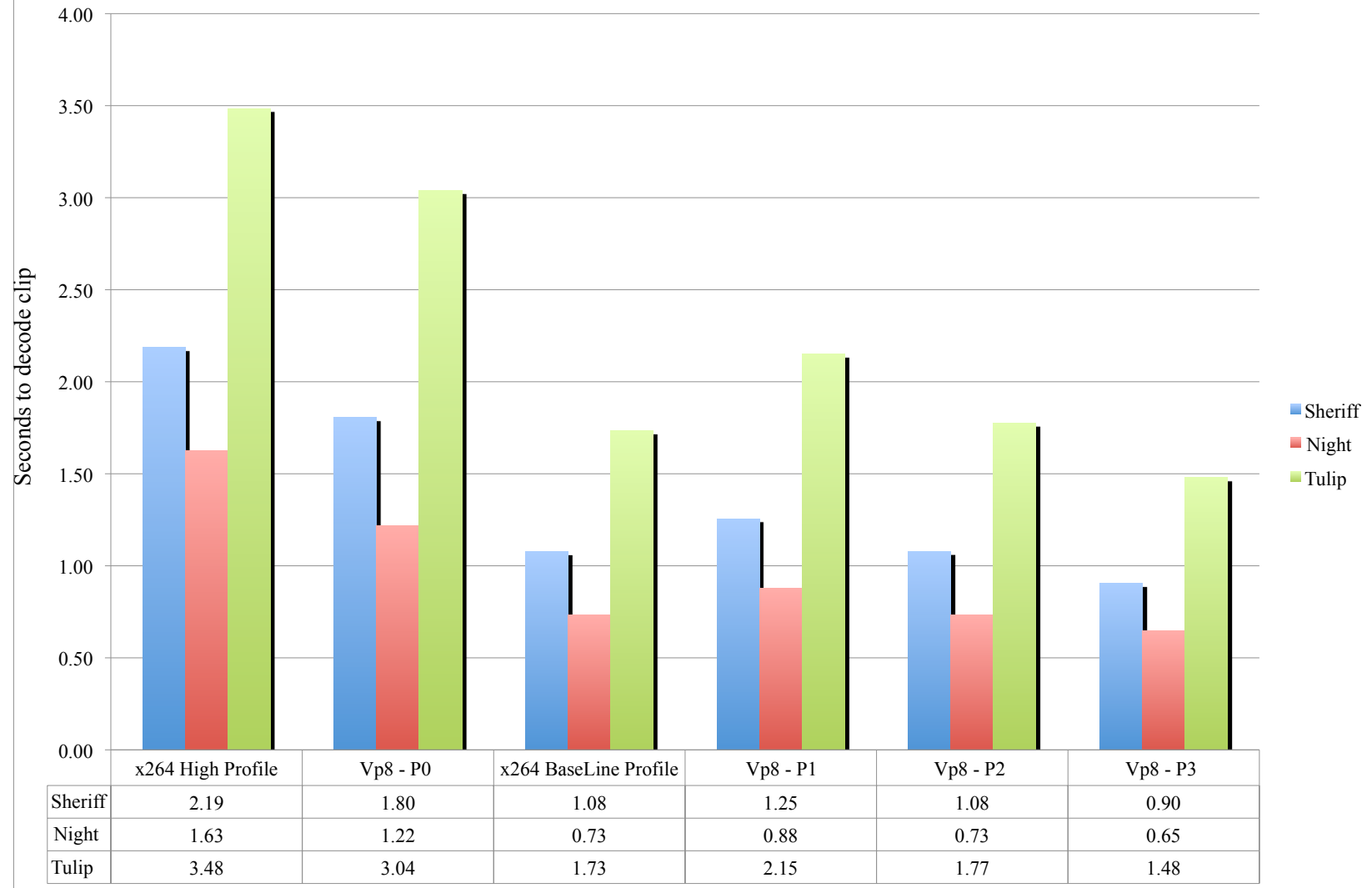
Cheer (320x240@30fps)



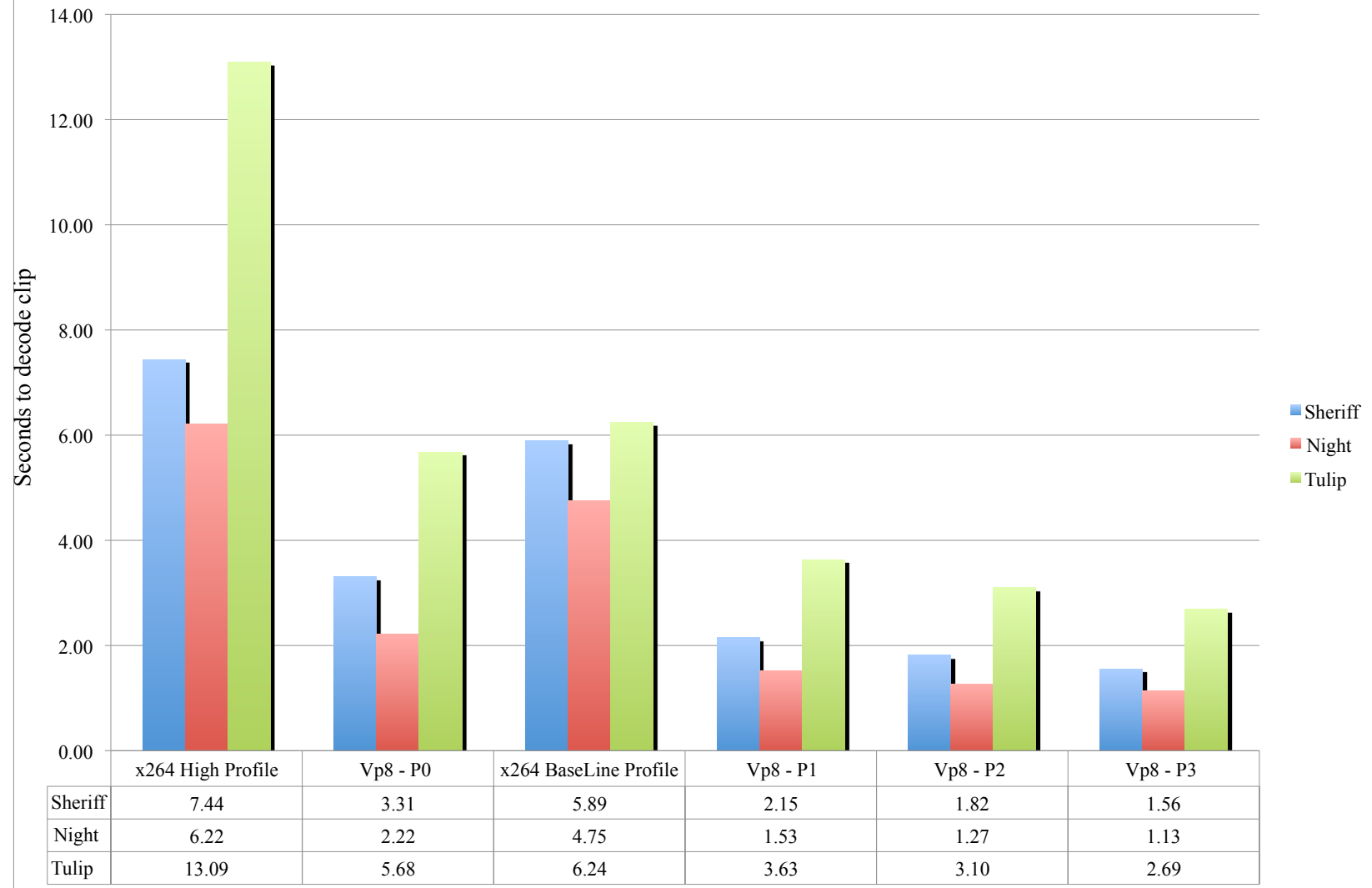
Football (320x240@30fps)



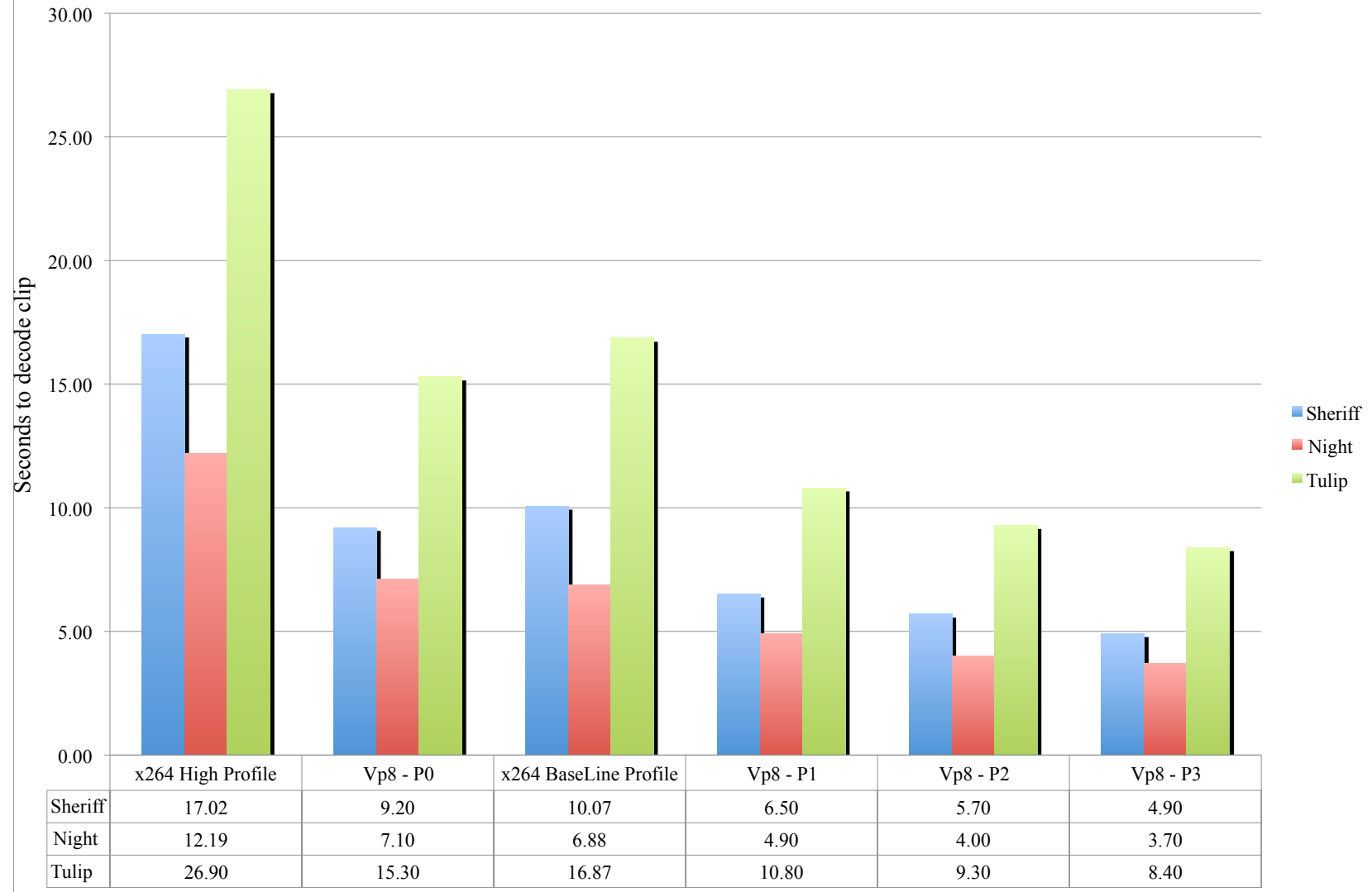
3.2Ghz quad core hyper-threaded (running on single Core)

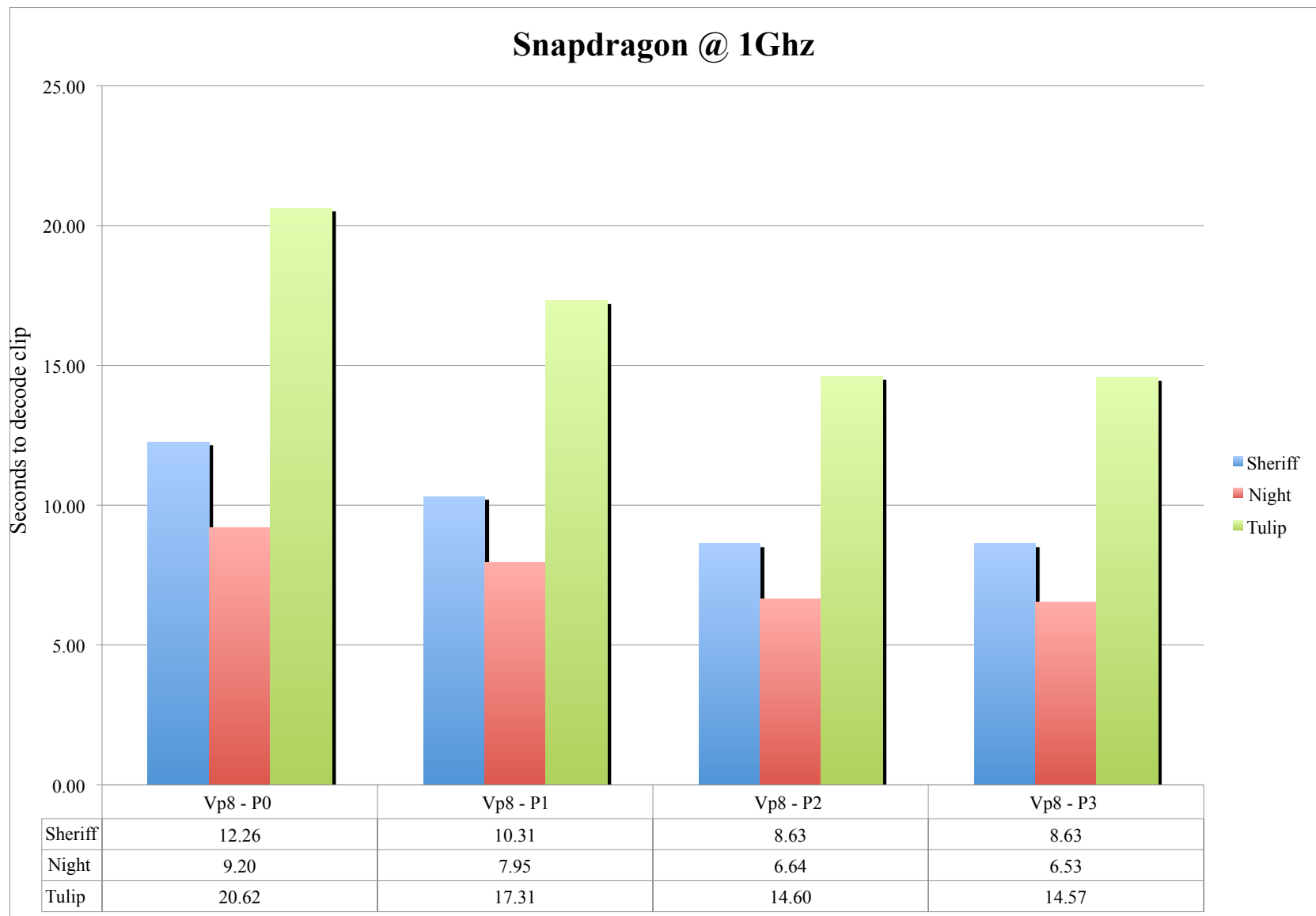


Intel(R) Core(TM)2 Quad CPU Q6600 @ 2.40GHz

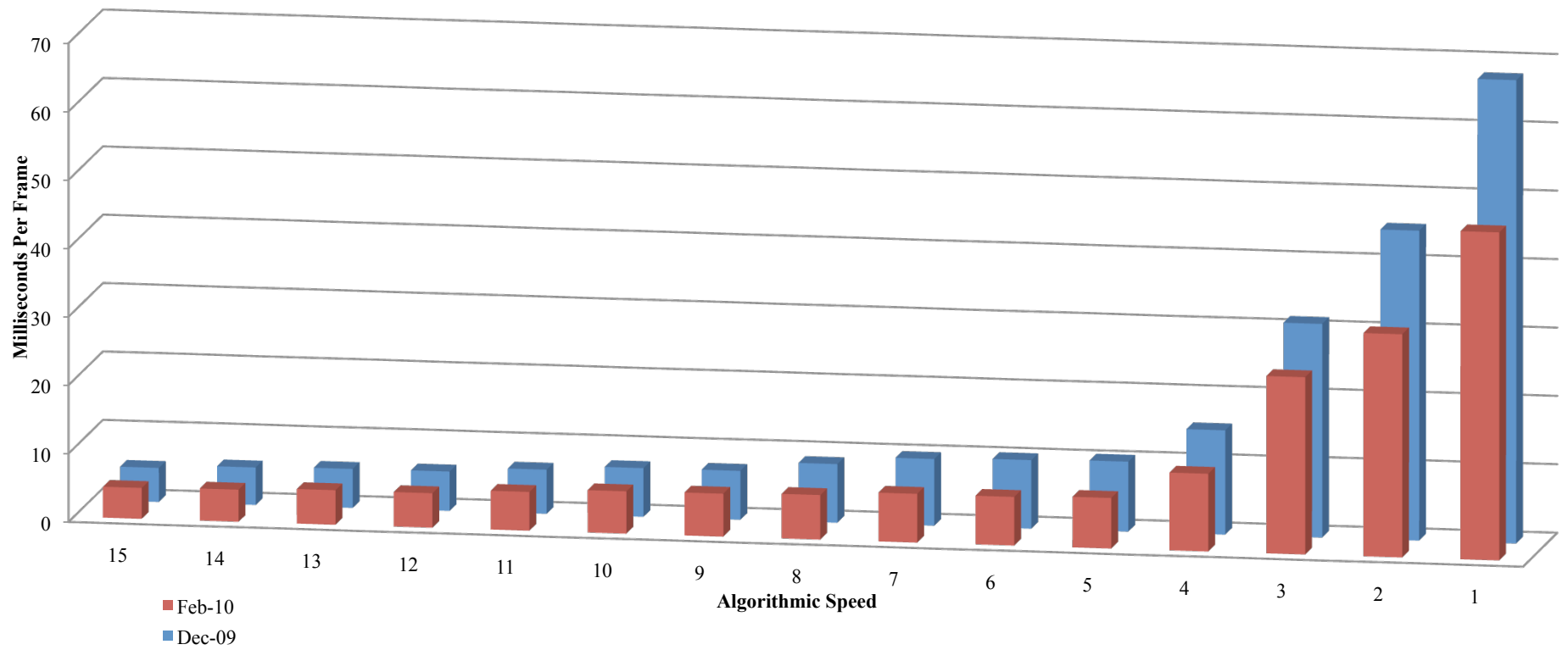


Intel(R) Atom(TM) CPU 230 @ 1.60GHz

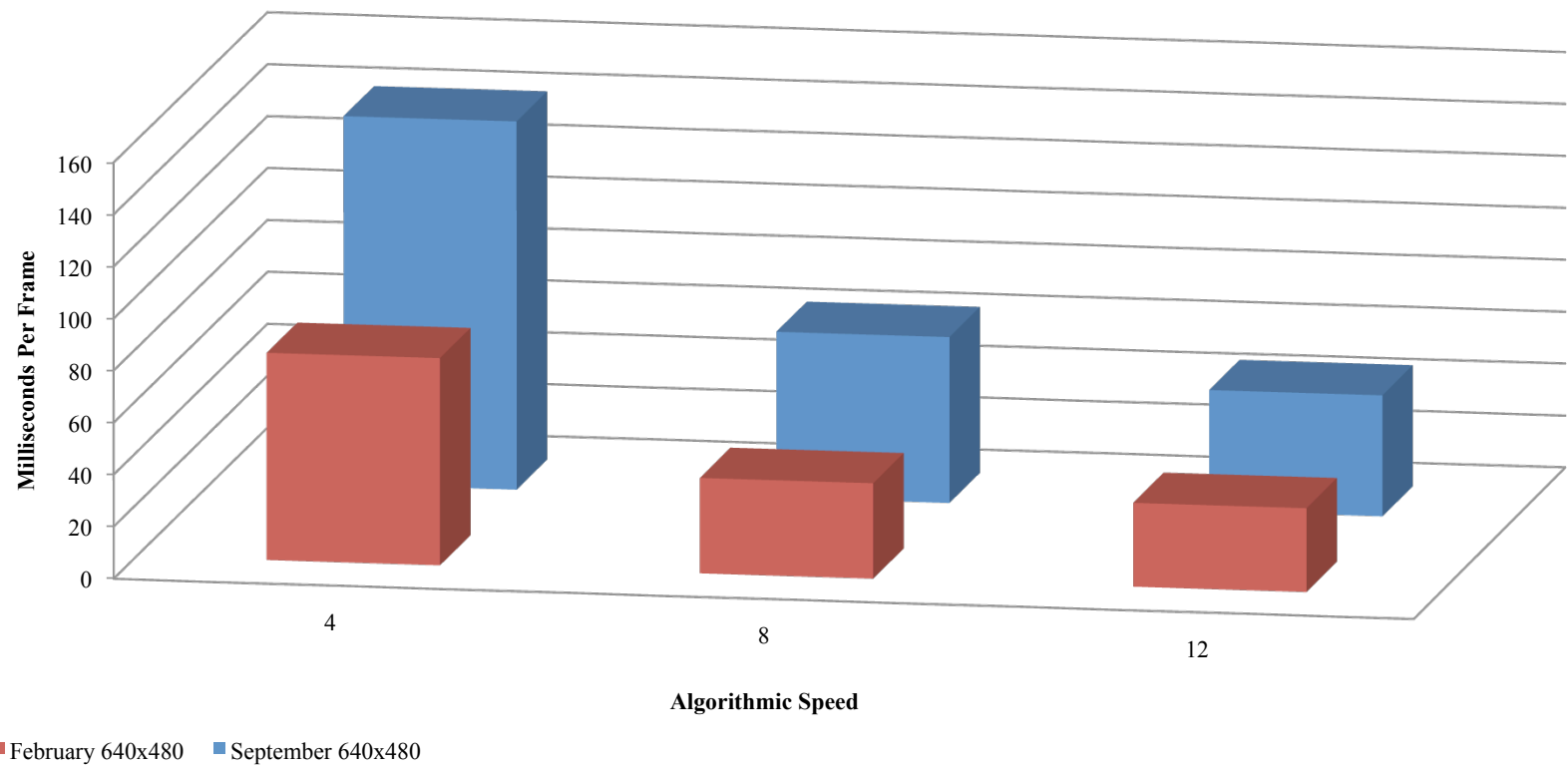




Real Time Speed– X86 640x480 Software Only Compress

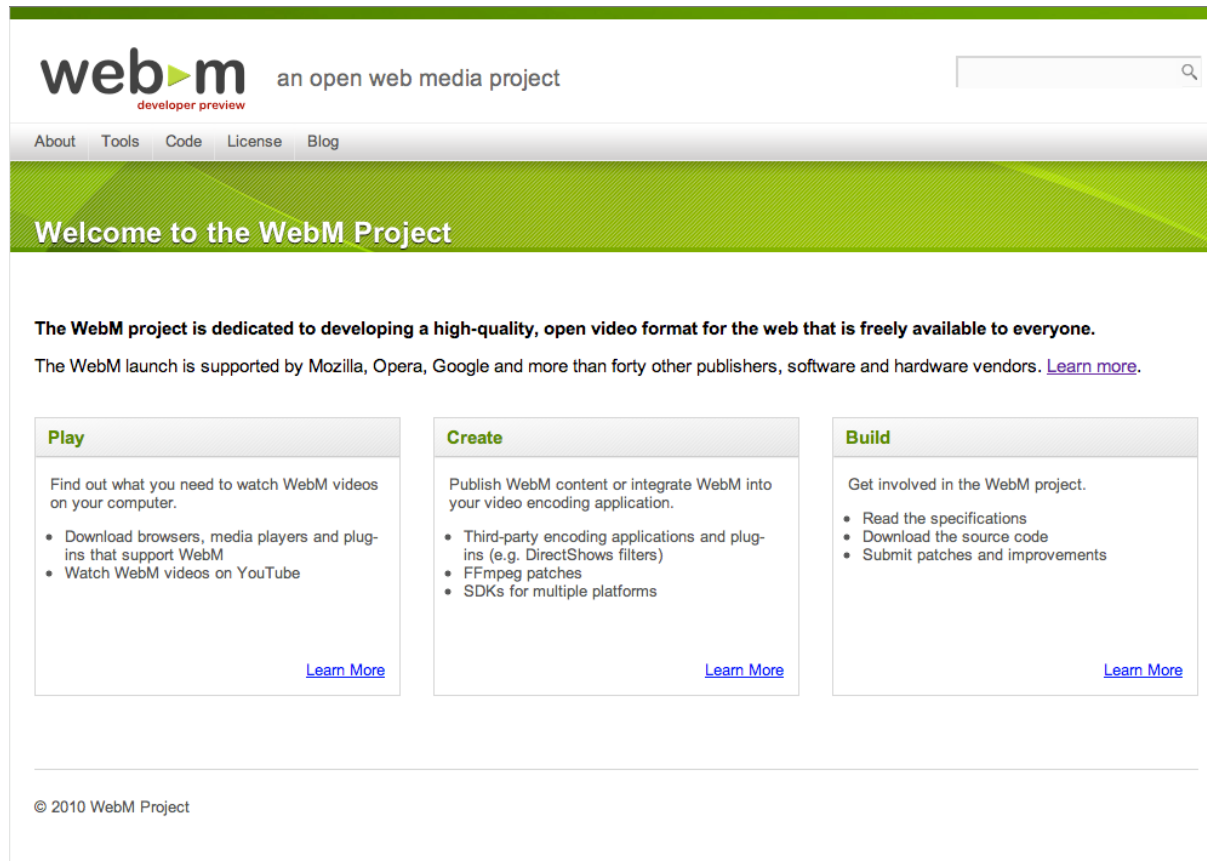


640x480 Neon Encoder



Openness

- Community effort – Here's how can contribute!



The screenshot shows the WebM project website. At the top, the logo 'webm' is displayed with 'an open web media project' and 'developer preview' below it. A search bar is on the right. A navigation bar contains links for 'About', 'Tools', 'Code', 'License', and 'Blog'. A green banner reads 'Welcome to the WebM Project'. Below this, a paragraph states: 'The WebM project is dedicated to developing a high-quality, open video format for the web that is freely available to everyone. The WebM launch is supported by Mozilla, Opera, Google and more than forty other publishers, software and hardware vendors. [Learn more](#).' Three columns are present: 'Play' (Find out what you need to watch WebM videos on your computer. • Download browsers, media players and plug-ins that support WebM • Watch WebM videos on YouTube [Learn More](#)), 'Create' (Publish WebM content or integrate WebM into your video encoding application. • Third-party encoding applications and plug-ins (e.g. DirectShows filters) • FFmpeg patches • SDKs for multiple platforms [Learn More](#)), and 'Build' (Get involved in the WebM project. • Read the specifications • Download the source code • Submit patches and improvements [Learn More](#)). The footer says '© 2010 WebM Project'.

TODO: Short Term - Improve on All Fronts

- Faster Decoding
 - Better multi core decoding
 - Use of SSE2 in decoder
 - GPU Decoding
- Improve the Overall Quality
 - Lagged Compress
 - “Best quality” encoding speed
 - Subjective quality enhancements
 - Better use of some of the internal features

What Browsers Support WebM?

- Tonight's Chromium nightly
- Chrome dev channel build available next week
- Tonight's Mozilla nightly
- Opera Beta
- Hopefully others, everyone is invited!
- All of this Info is found on webmproject.org



Industry Support

Software



Hardware



Platforms and Publishers



Demo: WebM in YouTube



Brightcove and HTML5 with WebM

David Mendels & Bob Mason

May 19, 2010

Over the last 4 years, online video has evolved way beyond simple playback



The Current Market Expects Fully-Functional Video Experiences



Advertising
Analytics
Social Sharing
Distribution
Shopable Video
Calls to Action
Subtitles
Multi-Bitrate
Quality of Service
Full Branding
Security
Mobile
and more
and more
Mobile
Security
Full Branding



The Brightcove Experience for HTML5 with WebM

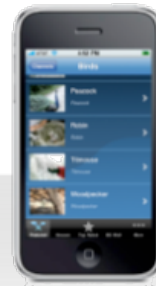
Delivers a high quality, interactive and fully monetizable video experience based on open standards



**High quality
transcoding to
WebM* and h.264**



**Automatic
Device
Detection**



**Native HTML5
Player Templates**



**Graceful
Fallback**

* Expected before year end 2010



ONE PLANET

Search all videos



▼ Explore the Ocean

▼ Explore the Rainforest

▼ Explore the Desert

↑ Upload Video

**Dolphins, Dolphins, Dolphins**

Having fun in the ocean

Rate ★★★★★ 562 Ratings

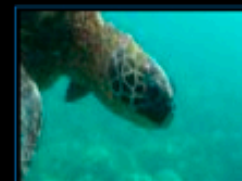


POST YOUR COMMENT



Related Videos

Popular

**Dolphins**
Dolphins**Sea Turtle**
Sea Turtle

Kevin Carle, Software Engineer, YouTube



YouTube HTML5 Experiences & Findings

- Debugging: `&Debug=true` , `&html5=True`
- Find WebM videos: `&webm=1` on any search
- Didn't use HTML5 semantic tags for now
 - Not quite supported across browsers
 - Lacking CSS support in some cases
- CSS choices
- Fallback content and source selection
- Device support & inline HTML5
- Variable speed playback
- Seeking: Pause, Seek, Play
- TimeUpdate / Progress / Buffering issues

Q&A

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<http://bit.ly/cvBgln>

Encoder Test Settings

- VP8 ivfenc encoder included with VP8 Codec SDK

```
ivfenc ..\%1.yuv %1_%2_vp8.ivf --i420 -w %3 -h %4 -p 2 --best --cpu-used=0 --target-bitrate=%2 --auto-alt-ref=1 --timebase=1/%5 -v --minsection-pct=0 --maxsection-pct=1000 --lag-in-frames=16 --kf-min-dist=0 --kf-max-dist=99999 --static-thresh=0 --min-q=0 --max-q=63
```

- x264v1376S

```
x264.exe --psnr --ssim --ref 10 --mixed-refs --no-fast-pskip --bframes 16 --b-pyramid normal --direct auto --subme 10 --trellis 2 --partitions p8x8,b8x8,i4x4,i8x8 --8x8dct --me umh --threads auto --thread-input --no-dct-decimate --pass 1 --bitrate %4 --fps %5 -o %1_264best_%4.mkv ..\%1.yuv %2x%3 2> %1_264best_%4_p1.log
```

```
x264.exe --psnr --ssim --ref 10 --mixed-refs --no-fast-pskip --bframes 16 --b-pyramid normal --direct auto --subme 10 --trellis 2 --partitions p8x8,b8x8,i4x4,i8x8 --8x8dct --me umh --threads auto --thread-input --no-dct-decimate --pass 2 --bitrate %4 --fps %5 -o %1_264best_%4.mkv ..\%1.yuv %2x%3 2> %1_264best_%4_p2.log
```