VP8 vs. H.264

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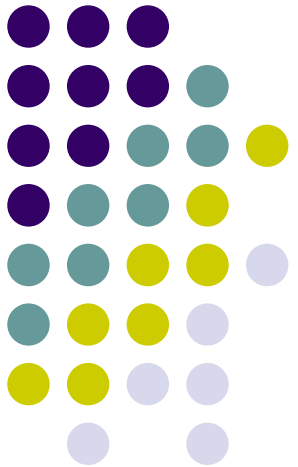
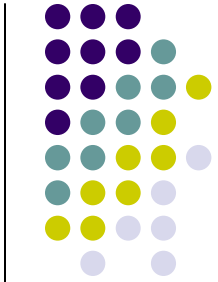


Before We Begin



- PDF Presentation available later today at www.streaminglearningcenter.com
- Will be available at www.streamingmedia.com later this week
- Videos at:
- www.doceo.com/SD_Comps.html
- www.doceo.com/HD_Comps.html

The Haiku Version

WebM is a great codec

That has no chance to supplant H.264

Absent device support/application integration

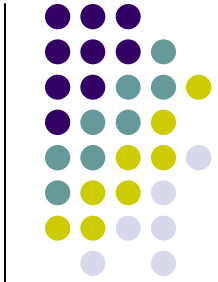
The Haiku Version

Om the video codec race

A technology can’t achieve great
Commercial success

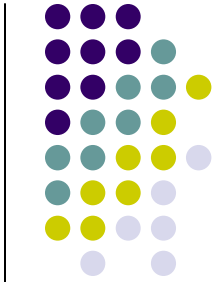
Without playing in Apple iDevices

Agenda Comparing the Technologies



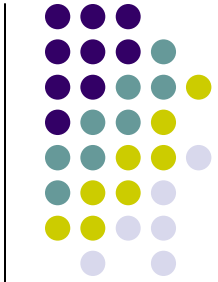
- Quality
- Playback CPU requirements
- Encoding time
- Where can it play?
  - Browser
  - Device
- Advanced integration
- Visit from John Luther (On2/Google)

VP8 vs. H.264 Quality



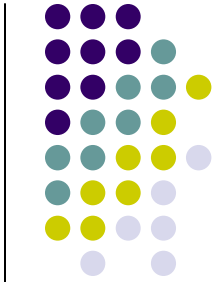
- Contenders
  - VP8 – encoded via On2
  - H.264 – MainConcept, encoded via Sorenson Squeeze
  - X264 – encoding via x264Encoder
    - http://www003.upp.so-net.ne.jp/mycometg3/

Encode Parameters



- SD Encoding
  - 640x480@ 500 kbps (468 video/32kpbs audio), 2 pass VBR
  - Very aggressive rates
- HD Encoding
  - 720p @ 800 kbps video/128 kbps audio.

VP8 vs. H.264 Quality

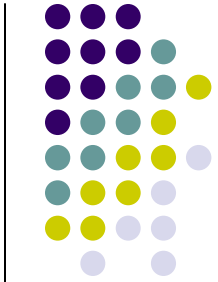


- My technique:
  - Encode to standard parameters
    - On2 encoded with latest rev
  - Make sure no dropped frames
  - Grab benchmark frames (what you'll see)
  - Play side by side and look for motion artifacts

SD Quality

- File location:
  - http://www.doceo.com/SD_Comps.html
  - http://www.doceo.com/HD_Comps.html

Quality



- The long and the short of it is:
  - H.264 may have a slight quality advantage, but it’s not commercially relevant
  - Even watching side-by-side (which no viewer ever does), very few viewers could tell the difference

SD Quality

SD Quality

SD Quality

SD Quality

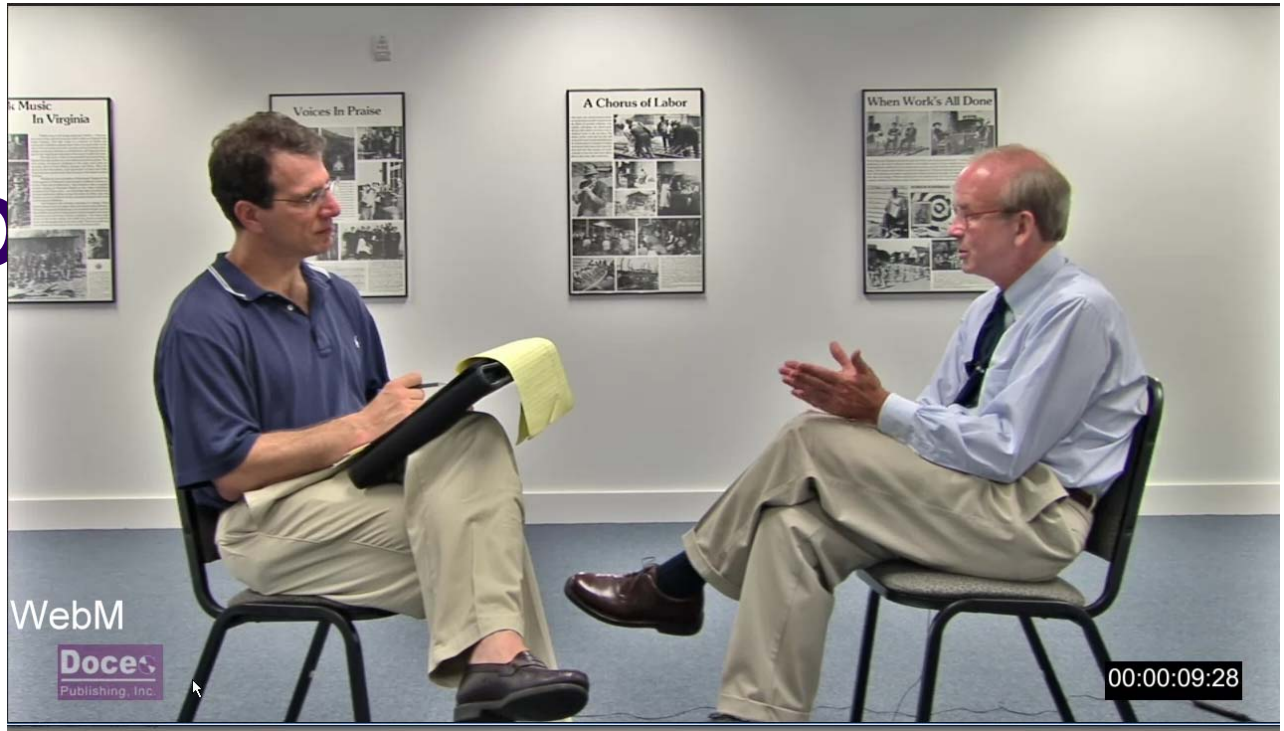
WebM
Hollywoodsports.com
00:01:22:26
x264
Hollywoodsports.com
00:01:22:26

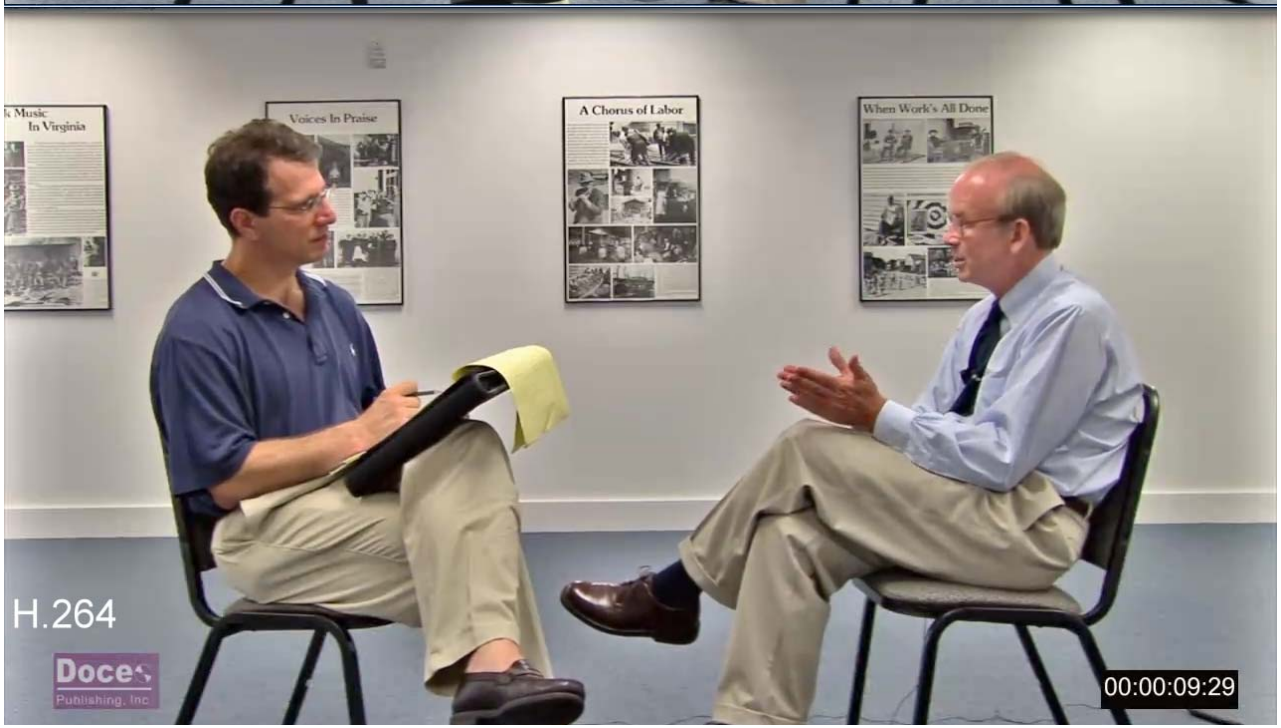
SD Quality

SD Quality

SD Quality

HD


Music In Virginia
Voices In Praise
A Chorus of Labor
When Work's All Done
WebM
Doce
Publishing, Inc.
00:00:09:28


Music In Virginia
Voices In Praise
A Chorus of Labor
When Work's All Done
H.264
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Publishing, Inc.
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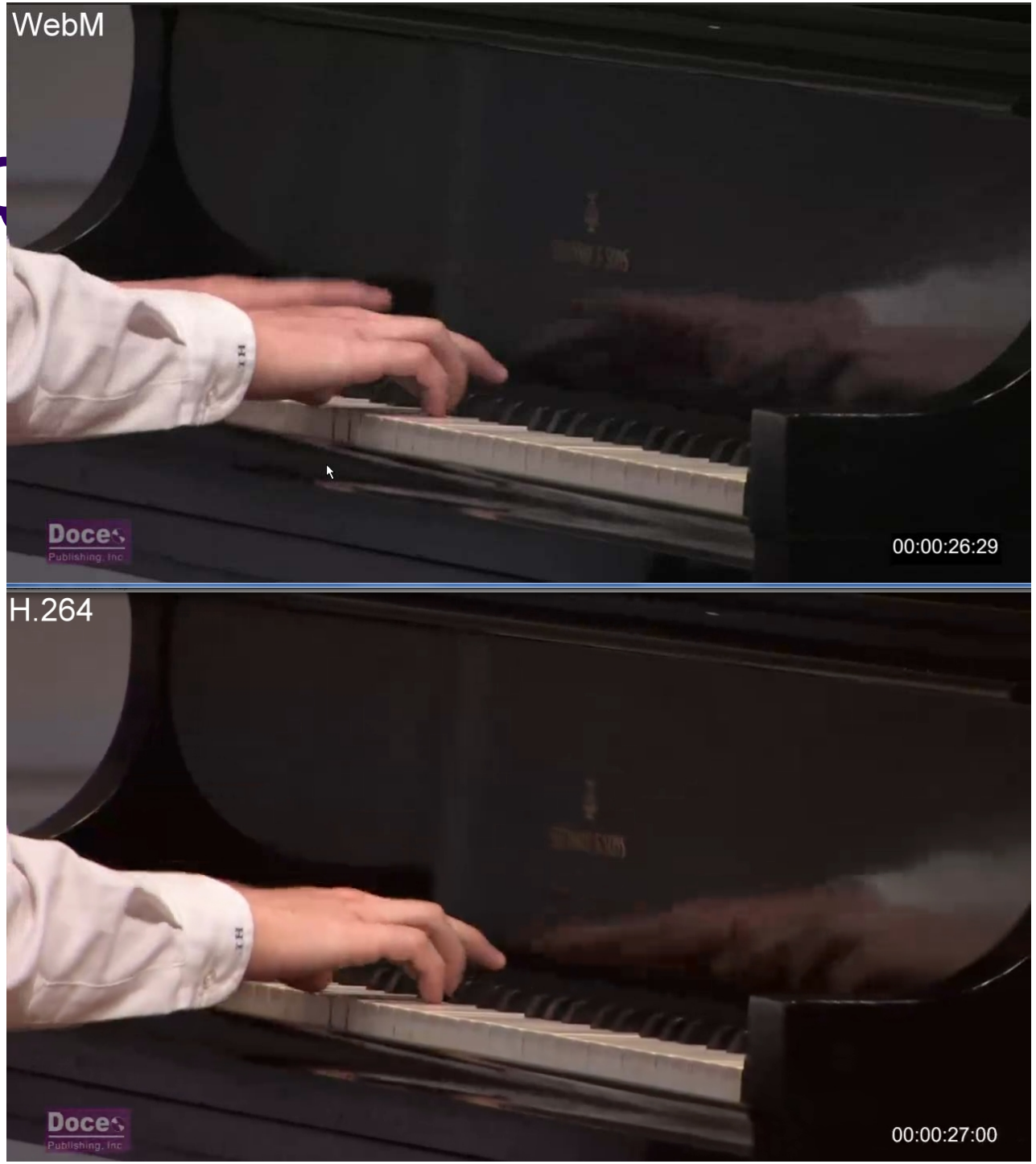
HD Q

Textbook of Pediatrics
Saunders Manual of Pediatric Practice
WebM
00:00:20:10

Textbook of Pediatrics
Saunders Manual of Pediatric Practice
H.264
00:00:20:10

HD C



HD (

HD

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WebM
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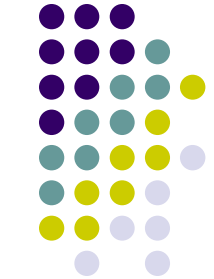
Doce
Publishing, Inc.
00:01:10:28

Playback CPU Requirements



- Browser playback:
  - When hardware acceleration exists (and H.264 is way ahead in this regard), H.264 is much more efficient
    - Very significant in low power devices
  - When hardware acceleration doesn't exist, the two technologies are neck and neck
  - H.264 has an *implementation* advantage, not a technology advantage

Devices with H.264 GPU Acceleration

	WebM	H.264 – Flash	H.264 – HTML5
MacBook Pro	42%	25%	15%
Hewlett Packard 8710w	40%	25%	47%

- Flash clearly much easier to decode
- HTML5-based H.264 playback (Safari) much more efficient on the Mac than Flash
  - Definitely better than it was

Devices without H.264 GPU Acceleration

	WebM	H.264 – Flash	H.264 – HTML5
Acer Aspire One Netbook	42%	46%	49%
iMac	51%	44%	23%

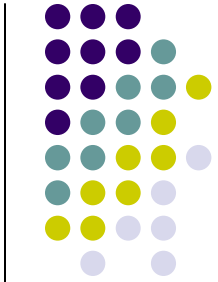
- Windows – without hardware support, no significant differential either way
- Mac – GPU support for H.264 in Safari makes H.264 the most efficient format

Media Player Playback

	WebM	H.264 – Flash	H.264 – HTML5	Web M Media Player
8710w	42%	25%	15%	21%
Aspire	42%	49%	42%	24%

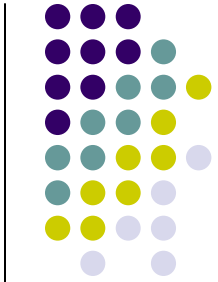
- VP8 appears to have some headroom for playback efficiency – without hardware support

Cost



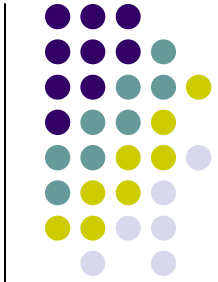
- H.264 – free for free internet viewing
  - Fees for PPV or subscription
  - www.mpeg-la.com for details
- WebM - free

Encoding Time

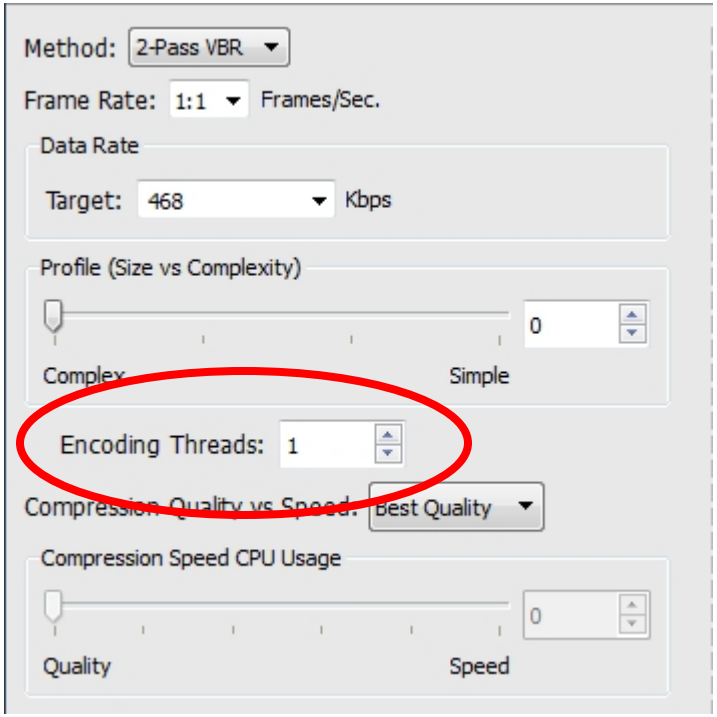


- Important, but not critical
- H.264 is faster, but not that much faster
  - H.264 has GPU acceleration from NVIDIA
  - Several third party accelerators also available

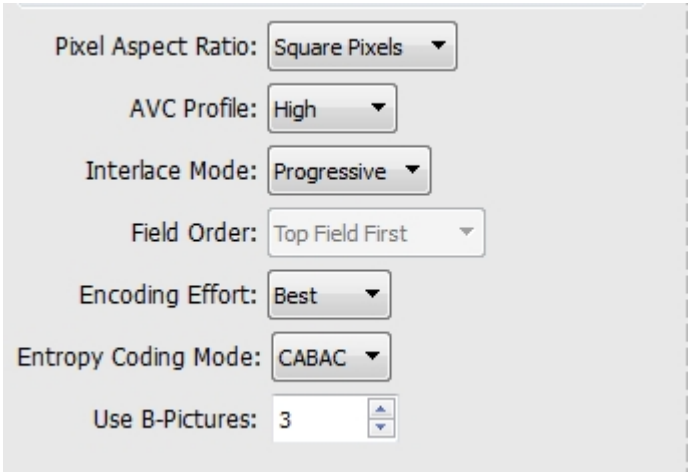
Encoding Times



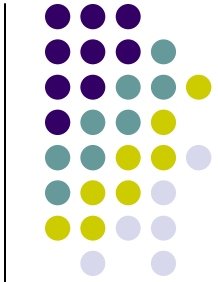
WebM



H.264



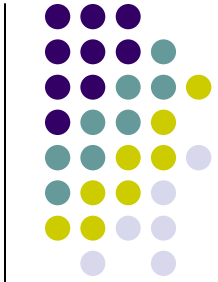
Encoding Times



	WebM (VP8)	H.264	VP6
SD Encoding Time - 1 slice (5:54 file duration)	41:40	11:20	17:05
HD Encoding Time - 1 slice (1:32 file duration)	15:25	4:23	10:32
SD Encoding Time - 12 slices (5:54 file duration)	13:16	10:54	
HD Encoding Time - 12 slices (1:32 file duration)	7:25	4:00	

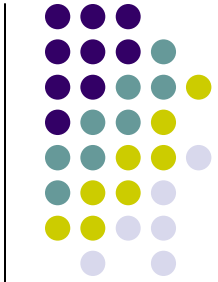
All times on Hewlett Packard Z800 with two 6-core 3.33 GHz Xeon processors, doubled to 24 total cores via hyper-threaded technology (HTT).

Where can it Play Natively?



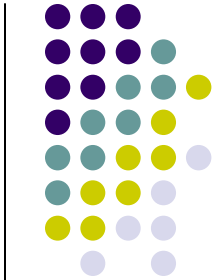
- H.264 (via HTML5)
  - Google Chrome
  - Microsoft IE 9
  - Apple Safari
- WebM
  - Google Chrome
  - The Opera Browser
  - Mozilla Firefox
  - Internet Explorer 9 “if already installed on the system”

Where can it Play Via Widely Distributed Players?



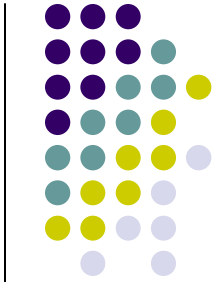
- H.264
  - Flash Player
  - QuickTime Player
  - Silverlight Player
- WebM
  - Flash Player (no date announced)
  - Media Player Classic
  - Moovida Core
  - VLC
  - Winamp
  - XBMC

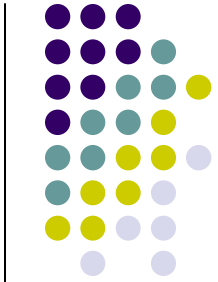
Device Support



- H.264
  - iDevices (with GPU)
  - Blackberry
  - Palm
  - Android (with GPU acceleration)
- WebM
  - Any platform that Opera, Firefox or Chrome can run on
    - GPU acceleration unknown
- **Are there any portable media players that can play WebM files?**
  - There are none in the market today but we're working with hardware manufacturers to bring WebM support to a wide range of devices.

Summary



- VP8 is a great codec
- H.264 enjoys vastly superior integration in streaming and device world
  - But costs in PPV and subscription
- It’s up to Google to prove utility and improve integration

Welcome John Luther