

VP8 for RTCWEB Mandatory To Implement

Technical arguments and issues
draft-alvestrand-rtcweb-vp8-00

VP8 Is Good Enough



- Widely implemented
 - Hardware and Software
 - 50+ SOC committed and many in production
 - VP8 camera (built-in and external) on the manufacturing line at Quanta.
- Widely deployed
 - YouTube, WebRTC, ooVoo, QQ, others
- Widely useful
 - One profile. All implementations interoperate.
 - Free and best of breed hw implementation design available for free.

VP8 Is Well Defined

- RFC 6386 - with source code
- No decoder profiles
- No known interoperability issues

Comparing Picture Quality

- A codec's output is no better than its platform
 - although it may be considerably worse
- Open source allows anyone to compare
 - if they can agree on what to compare against.
- Comparing is hard. PSNR is at least a metric.
- Command lines to compare:

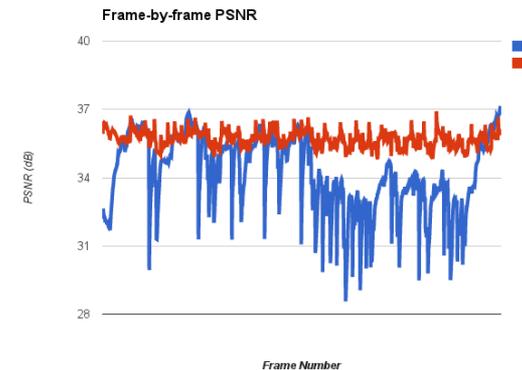
```
vpxenc --lag-in-frames=0 --target-bitrate=$5 --kf-min-dist=3000 --kf-max-dist=3000 --cpu-used=-2 --fps=$4 --static-thresh=1 --token-parts=1 --drop-frame=0 --end-usage=cbr --min-q=2 --max-q=56 --undershoot-pct=100 --overshoot-pct=15 --buf-sz=1000 --buf-initial-sz=5000 --buf-optimal-sz=600 --max-intra-rate=1200 --resize-allowed=0 --passes=1 --rt --noise-sensitivity=0 -w $2 -h $3 $1.yuv -o $1-$5.webm
```

```
x264 --vbv-buFSIZE $5 --bitrate $2 --fps $3 --profile baseline --no-scenecut --keyint infinite --input-res $4 -o ./$1_$2.mkv $1
```

● Scripts and test data are made public

VP8 Wins on Quality

- Conferencing test: 37% less bits, same PSNR as H.264 constrained baseline
 - Google has made test script public
- MPEG references from IVC project: Significantly better than AVC "anchors"
 - Study done by independent contributors



VP8 Wins on Performance

Tests run on difficult 720p material

- Software Encode: 720p 48-96 fps, 1 core
- Software Decode: 720p 200 fps on PC hardware (1 core)
 - H.264 Baseline: 100 fps
- Details in the internet-draft

VP8 Has Hardware

- More than 50 manufacturers
- Freely available hardware IPR and RTL
- Consistent capability sets

Performance is good

- 1080p decode in 25 mW
- > 10 SD stream decode on a single chip
- More frugal in chip area and memory bandwidth than H.264

Summary

- VP8 can meet or beat the performance of all proposed alternatives, on any metric.
 - If the test set is reasonably large & diverse
- VP8 is suitable for and used for real time.
- VP8 is available now. The reference platform is the one people use.
- VP8 is good enough to make interworking using the MTI viable for RTCWEB.
- VP8 should be chosen for RTCWEB MTI.

Addendum: Frames, bigger

VP8 vs H.264 at 146/184 kbps



Addendum: PSNR - bigger

