H.264/AVC as RTCWEB MTI Video Codec

Joint presentation (except performance data) of
draft-burman-rtcweb-h264-proposal-00
draft-dbenham-webrtc-videomti-00
draft-marjou-rtcweb-video-codec-00

IPR Statements

- Ericsson, Cisco, Microsoft, Nokia, and Apple IPR on H.264 have been disclosed and declared to ISO/IEC/ ITU in compliance with the rules of those organizations
- Apple and Cisco ISO/IEC/ITU declarations for AVC Constrained Baseline are Type 1 (prepared to grant RF license)
- Ericsson, Cisco, Microsoft, and Apple are part of MPEG-LA H.264 pool

Combined Presentation Goal

- Propose H.264/AVC as RTCweb MTI video codec
- Summarize arguments
- Facilitate discussion
- Enable informed choice

Proposal

- H.264/AVC Constrained Baseline Profile Level 1.2 MUST be supported
  - Level 1.2 matches many frame-sizes and frame-rates for example:
    - 352*288 (CIF) at 15 Hz
    - 320*240 (QVGA) at 20 Hz
    - 176*144 (QCIF) at 60 Hz

- H.264/AVC High Profile Level 1.3, extended to 720p30 is RECOMMENDED

Selection Criteria

- Implementation
- Interoperability
- Negotiation
- Performance (another presentation to cover more)
- Licensing/IPR Status

Implementation

- Software
  - Long list of available implementations
  - Recent Windows™ and Mac OS X™ has H.264 encode/ decode support in OS
- Hardware
  - Most beneficial for devices that need low power consumption
  - High quality (High Profile 1080p30) encoding/decoding in some chipsets from: (* = verified low delay real-time)
    - Qualcomm*, ST/Ericsson*, TI, Nvidia, Renesas, Mediatek, Huawei Hisilicon, Intel, Broadcom, Samsung

      → Performance is non-issue, even in mobile devices

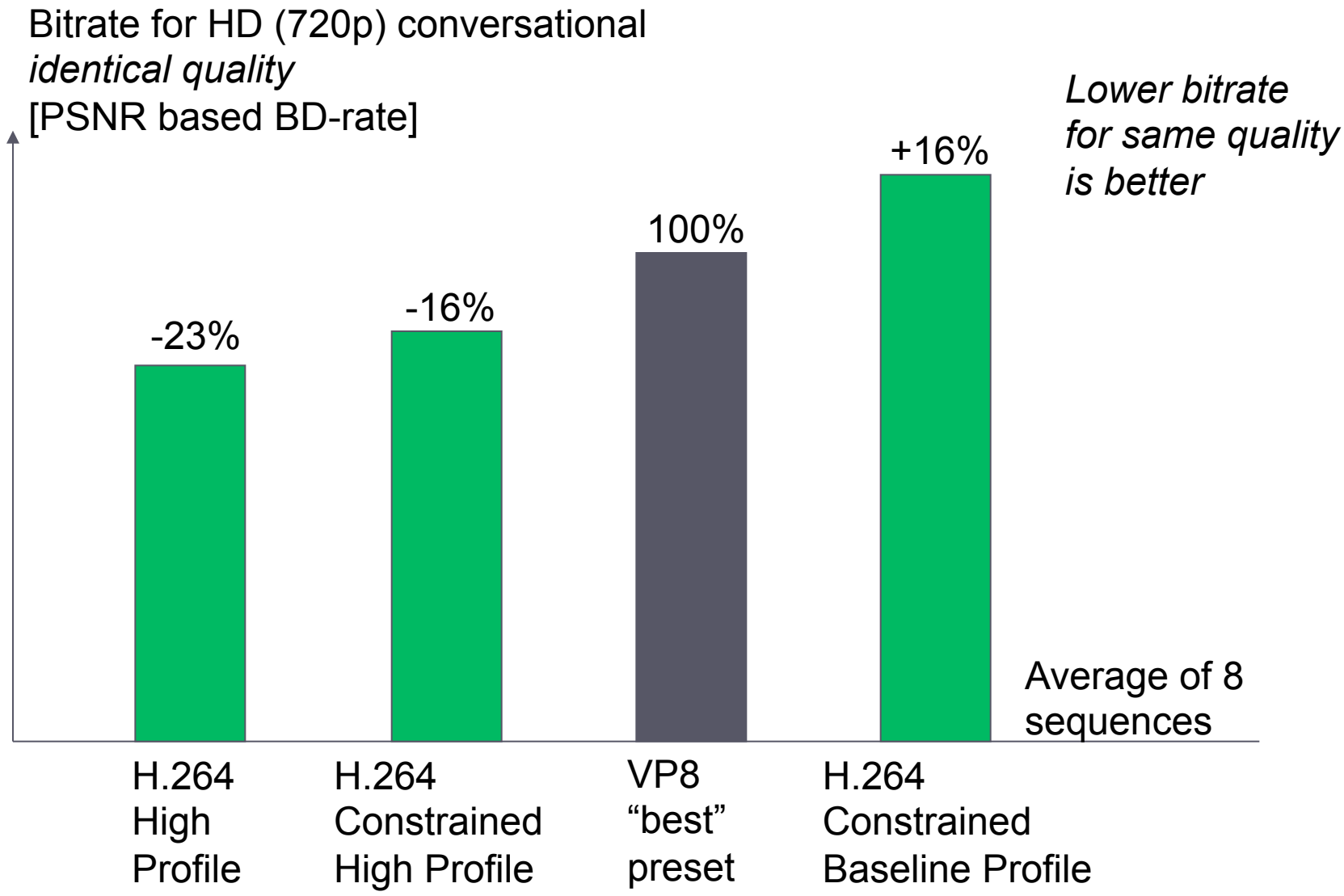
Interoperability

- Most available video conferencing systems support H.264
- Many other standards already specify H.264 for video
  - 3GPP/GSMA
    - Video call (MTSI / VoLTE)
    - Video streaming (PSS / 3GPP-DASH)
  - Wi-Fi Alliance® Miracast™ (“Wireless HDMI”)

Negotiation

- Well established method to match encoder/decoder
  - Decoder announces highest complexity it can support
  - Encoder must keep within this limit to ensure video can be decoded
  - Limited but extensible set of “conformance points”
- Has defined support in SDP Offer/Answer

Performance



IPR & Licensing Status

- Well-known IPR Status
  - All contributors to ITU-T/ISO/IEC(MPEG) standards must disclose and license their patents under RAND or Royalty-Free terms http://www.iso.org/iso/standards_development/patents
  - H.264/AVC has had nearly a decade to expose other patent holders

- Long standing H.264/AVC license pool available from MPEG-LA http://www.mpegla.com/main/programs/AVC/Documents/AVC_TermsSummary.pdf
  - Cover multiple profile tools, including Constrained Baseline
  - Single License for both Encoder / decoder
    - First 100 000 licenses are free
    - If a device already has a licensed implementation, using that (as OEM) or adding more implementations does not require additional license fees
  - Content License
    - Real-time interactive and “Internet” video is royalty free
  - Not all H.264/AVC patent holders are MPEG-LA AVC pool members

Comparison of Impacts to Licensing/IPR

	AVC	VP8
Developed Openly in Standards Body	Yes	No
Required Patent Disclosures and RAND licensing by participants	Yes	No
Royalty Free Open Source Implementation	Yes	Yes
Patent Royalties	Yes for >100KU/yr	None known(*)

* MPEG-LA Patent Pool License Not Published

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