H.264/AVC as RTCWEB MTI Video Codec

Joint presentation (except performance data) of
draft-burman-rtcweb-h264-proposal-01
draft-dbenham-webrtc-videomti-00

IPR Statements

- Ericsson, Cisco, Microsoft, Nokia, France Telecom 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, France Telecom, 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 Constrained 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™ have H.264/AVC 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

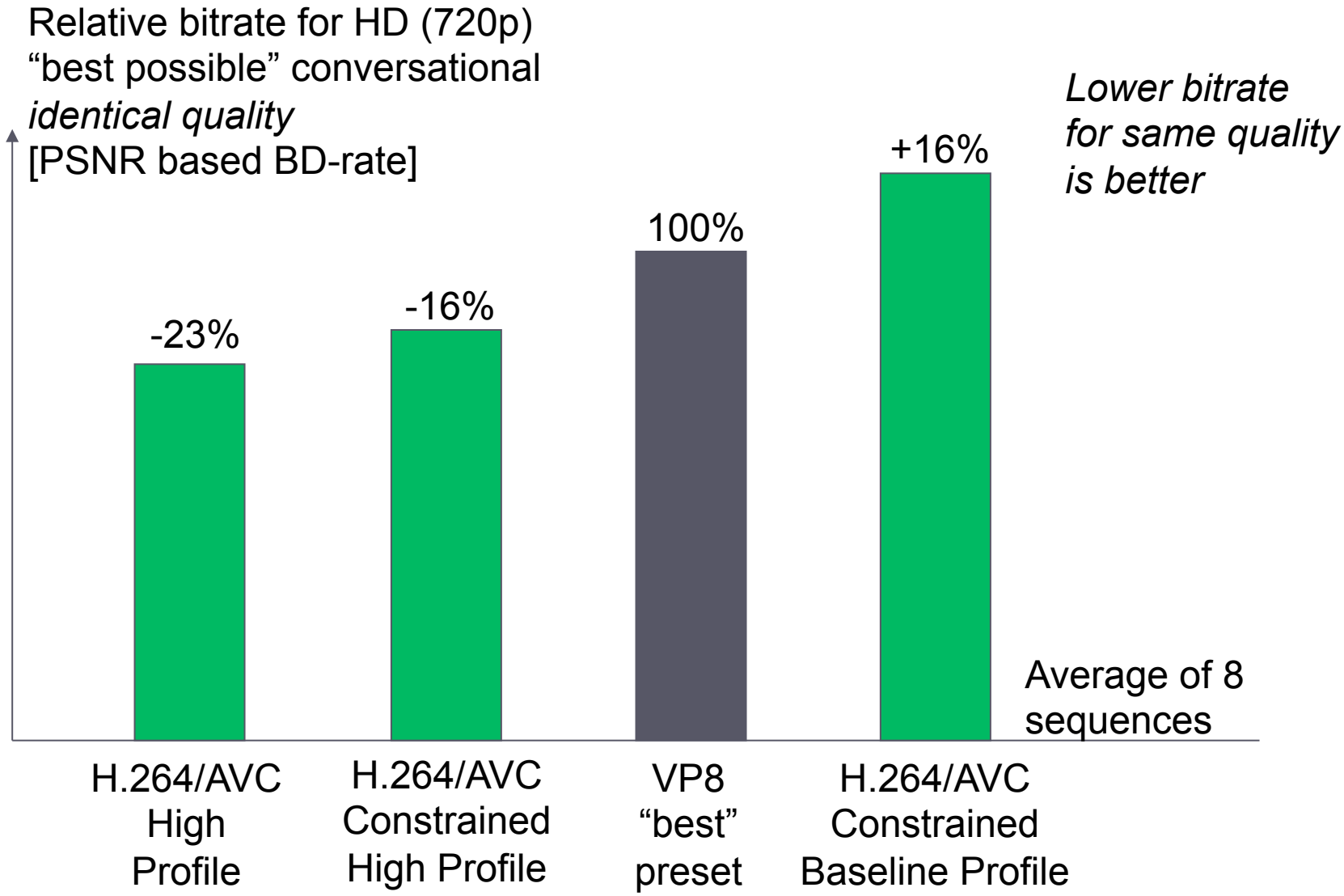
Interoperability

- Most available video conferencing systems support H.264/AVC
- Many other standards and industry groups already specify H.264/AVC 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
    http://www.itu.int/ipr/IPRSearch.aspx?iprtype=PS
  - 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 and High
  - 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
    http://www.mpegla.com/main/programs/AVC/Pages/Licensors.aspx

Comparison of Impacts to Licensing/IPR

	AVC	VP8
Developed Openly in Standards Body	Yes	No
Required Patent Disclosures	Yes	No
RAND licensing	Yes	No
Open Source Implementation	Yes(*)	Yes
Patent Royalties	Yes for >100 KU/yr	Claimed(**)

* Royalty Free Copyright License

** MPEG-LA Patent Pool *may* be RF, but there are also others

End