Great Codec Question: Should WebRTC adopt the 264/265 codecs or not and what would it take for the 264/265 codecs to be acceptable? And what about Audio?

Session: D1-2

Anatoli Levine
Director, Product Management
Avaya
alevine@avaya.com

Panelists

- Alex Eleftheriadis
  - Chief Scientist and co-founder
  - Vidyo
- HP Baumeister
  - Director, Digital Media Technologies
  - Fraunhofer
- Matt Frost
  - Head of Strategy and Partnerships
  - Google Chrome Web Media
- Tim Terriberry
  - Developer
  - Mozilla

Vidyo®

Personal Telepresence

Alex Eleftheriadis
Chief Scientist and co-founder
Vidyo, Inc.
alex@vidyo.com

Alex Eleftheriadis

- Previously Associate Professor of Electrical Engineering at Columbia University
- 27 US patents, 39 more pending worldwide
- Patents used in Blu-ray Disc, H.264, and ATSC digital television systems
- Co-Editor of RFC 6190, H.264 SVC Conformance / Editor of MPEG-4 Systems
- Co-chairs SVC technical groups in IMTC and the UCI Forum
- Awards include ACM Multimedia Open Source Software Award (for Flavor, 2004)

A few words about Vidyo and H.264:

- Vidyo co-developed H.264 SVC from 2005 (18 contributions, sequences, bitstreams)
- First company to introduce SVC in videoconferencing products in 2008
- Developed new architecture of “media relay” servers (the VidyoRouter™)

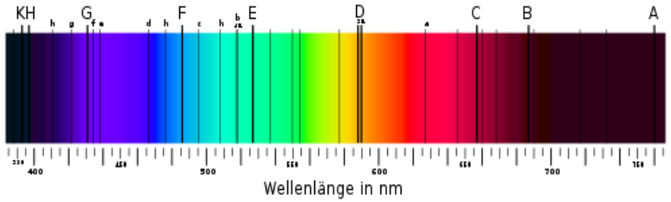
Fraunhofer
IIS

WebRTC
CONFERENCE & EXPO

HP Baumeister
Director
Fraunhofer USA
hp.baumeister@dmt.fraunhofer.org

Who is Fraunhofer?

Joseph von Fraunhofer (1787-1826)



- **Europe‘s largest applied research organisation**
- **Not-for-profit**
- **Very diverse: 60 Institutes, working groups, branch labs and application centers at 40 locations, in several countries including the US**
- **21,000 + employees**
- **About 80% raised through contract research, some government funding**

Fraunhofer IIS

Who is Fraunhofer IIS?

HQ Erlangen, Germany

San Jose Office

- Recognized as the inventor of MP3
- Designed firmware for first flash-memory and hard-disk MP3 players
- Co-Inventor of AAC ("2nd gen mp3")
  - Inventor of AAC-LD and co-inventor of AAC-ELD
  - Co-inventor of xHE-AAC
  - Major contributor to EVS standardization (next gen mobile codec in 3GPP)
- major systems technology contributor to Digital Radio Mondiale (DRM), DAB, DVB, WorldSpace and SiriusXM Satellite Radio
- Software supplier to over 1,000 customers, used in over 6,000,000,000 devices

Fraunhofer IIS

The AAC codec family

- Practically all products with an audio capability use AAC today
  - Mobile phones, tablets, TV's, STB's, OS's, software
  - Highly optimized software, hardware acceleration
- Open standard; mature, stable and familiar licensing framework with contributions from 14 leading companies
- Native in Android and iOS, accessible via API's
  - Including AAC-ELD (low latency version of AAC)
  - See also www.Full-HD-Voice.com
  - Some 400+ M FaceTime devices using AAC-ELD today
- "Unified License" covers all AAC codecs, thus, no additional royalty for AAC-ELD
- AAC is the standard audio codec used with H.264

Matt Frost
Chrome Web Media
Google Inc.
mfrost@google.com

Matt Frost

- Member of Google's Chrome Web Media team
- Team of 100+ focusing on web video (WebM video, EME, etc.) and WebRTC
- Key participants in development of VP8 and new VP9 video codec
  - VP9 bitstream finalized on June 11
- www.webmproject.org
- www.webrtc.org

Timothy B. Terriberry
Mozilla
tterriberry@mozilla.com

Timothy B. Terriberry

- I make codecs and give them away for free
- Codecs I've worked on
  - Vorbis
  - FLAC
  - Opus*
  - Theora*
  - VP8
  - VP9

The Great Codec(s) Question

- Possible Video Codec solution:
  - VP8/VPx only
  - H.264/H.265 only
  - Both
- Issues:
  - Royalty free versus paid for -
  - Mental state of open source community (“must be free or else”)
  - Interoperability with existent equipment (transcoding/or not)
  - Long road to the full potential (interoperable H.264 high profile and SVC are showing up only now)
  - Mobile platforms are exceedingly more and more important. Most codec chip vendors have H.264 implemented and roadmaps for H.265. What about VPx?

Questions

1. Why can’t we have both/should we have both
2. If H.264 licensing issues can be solved (one license per device, used by all apps), will H.264 be The One?
3. Do we need to have choices for audio?
4. What about licensing cost for Audio?
5. The question of default codec and Nokia’s monkey wrench
6. H.264 SVC can adapt to unmanaged networks – what VPx has to say?