AGENDA

- Introducing the hardware team
- Current status of VP8 hardware adoption
- Things to focus on in the Next Gen Open Video
The start-up Hantro was founded in 1992 in Oulu, Finland
Focused on video coding since 1998
Provider of HW IP cores and ARM optimized software codecs
Acquired by On2 Technologies in 2007
Acquired by Google in 2010
Became the Chrome Media Hardware team
Released the world’s first VP8 HW decoder in 06/2010, and the world’s first VP8 HW encoder in 02/2011
A new video codec cannot be truly successful without wide device support

- Implement VP8 / multi-standard hardware accelerators
- Ensure hardware’s accessibility in different platforms
- Proliferate the technology to semiconductor companies
  - WebM Project
  - Strategic partners
  - Channel partners
- Close participation in the Next Gen Open Video development
VP8 HW RELEASES

- Hardware multi-standard decoder – focus on cost and performance
  - G1 Decoder v1 released in June 2010
  - G1 Decoder v2 released in February 2011
  - G1 Decoder v3 “Chip Shot” released in June 2011
  - G1 Decoder v4 “Driver” released in December 2011
  - G1 Decoder v5 “Eagle” released in March 2012
  - G1 Decoder v6 “Fairway” released in July 2012

- Hardware multi-standard encoder – focus on quality
  - H1 Encoder v1 “Anthill” released in February 2011
  - H1 Encoder v2 “Blueberry” released in May 2011
  - H1 Encoder v3 “Cloudberry” released in August 2011
  - H1 Encoder v4 “Dragonfly” released in November 2011
  - H1 Encoder v5 “Evergreen” released in March 2012
  - H1 Encoder v6 “Foxtail” released in July 2012
VP8 HARDWARE ENCODER QUALITY IMPROVEMENTS

- 30-40% quality improvement over six generations

'soccer_30fps_w352h288'

![Graph showing quality improvement over bitrates](graph.png)
VP8 Hardware Adoption

- Huge semiconductor adoption across different applications
  - > 50 VP8 standalone codec licensees at WebM Project
  - > 30 Multi-standard G1 Decoder licensees
  - > 10 Multi-standard H1 Encoder licensees
  - > 10 third-party implementations of VP8 hardware

- G1 and H1 in mass production – publicly announced chipsets:
  - Rockchip RK3066 application processor
  - Hisilicon K3V2 application processor
  - ST-Ericsson NovaThor L9540 application processor
  - LG Electronics SmartTV SoC

- In 2013, we expect majority of new chipsets to include full VP8 support
WHAT WILL BE DIFFERENT WITH THE NGOV

- Provide the hardware point of view
  - Ensure a bit-precise, unambiguous specification
  - Verify that each part of the codec is easy to implement in hardware
  - Help design the bitstream to support low-latency streaming, data partitioning, multicore
  - Improve real-time features

- Design hardware corner case test vectors (worst case memory bandwidth, worst case entropy coding, maximum length motion vectors, etc.)

- Provide feature requirements for third party developers
Providing the NGOV Accelerators

- Closely implementing hardware along with algorithm development

- NGOV accelerators available within a quarter after bitstream specification freeze

- Same distribution model as with VP8 – free of charge
  - Distribution channels well established -> Faster adoption than with VP8 expected

- Wide device adoption estimated for 2015