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VP9 Software Decoder

for Intel x86 and ARM Cortex-A (ARMv7 & ARMv8) Processors

Overview

VP9 is the next generation video compression technology developed by Google. VP9 promises up to 2X compression over H.264 and VP8 video compression standards. VP9 is an open, royalty free standard.

AceThought has used its deep expertise in video compression and optimization to extract the best performance of VP9 decoder from embedded processor like ARM Cortex-A. AceThought VP9 software video decoder is available on a range of Intel x86 and ARM Cortex Ax platforms which is designed for performance, multi-threading, conformance and variety across mobile and desktop processors and operating systems.

Benefits

- Optimized for 32 and 64 bit **ARM Cortex-A** (ARMv7, ARMv8) and **Intel x86** architecture.
- Supported on **Android**, **iOS** (iPhone, iPad), **Windows 10 Phone**, **Linux**, **Mac OSX** and **Windows**.
- Multi-thread for multi-core processors.
- **ANSI C** implementation with key modules optimized for vector instructions (ARM **NEON** and Intel **SSE**, **AVX**).
- Efficient software architecture
- Re-entrant library
- Error detection of lost packets and frames
- Availability of both C and C++ interfaces for easy integration.

Features

- VP9 Bitstream & Decoding Process Specification - v0.6, 31st March 2016
- I, P, Last Frame, Alternate Reference and Golden frames.
- Intra Prediction
  - 10 Prediction modes with 8 directions, DC_PRED and TM_PRED.
- Inter Prediction
  - Superblocks – 64x64, 64x32, 32x64, 32x32
  - Recursive partitioning of superblocks.
  - 1/8 pixel interpolation for Y
  - 1/16 pixel interpolation for U & V
- 14 squares transforms with size 4x4, 8x8, 16x16 and 32x32.
- Loop Filtering
- Segmentation

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Performance

The Table 1 below summarizes the CPU Load for Quad-Threaded VP9 decoder on 1.6 GHz quad core ARM Cortex-A15 application processor with NEON™ Advanced SIMD running under Android OS 4.3.

Table 1. Performance Benchmark Numbers for 1.6 GHz Quad Core ARM Cortex A15

Resolution	**Bit-Rate**	**Frame-Rate**	**MHz** *(Single-Threaded)*
1280x720	1Mbps	24fps	45%
1920x1080	2Mbps	24fps	85%