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H.264 (AVC) Software Video Decoder

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

Overview

AceThought has been a leading developer of products based on H.264 technology and our H.264 software Decoders IP is available on a range of Intel x86 and ARM Cortex Ax platforms. These codecs have been deployed in a number of customer products and services. Our H.264 software video decoders are designed for performance, multi-threading, conformance and variety across mobile and desktop processors and operating systems.

H.264 or AVC (Advanced Video Coding), also known as MPEG-4 Part 10 is a widely adopted video compression standard and is used for content delivery on web, mobile and set-top boxes.

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.
- 720p HD decoding on dual core and 1080p HD decoding on quad core.

Features

- Fully compliant with H.264 ISO/IEC 14496-10 **Baseline, Main & High Profile**
- I, P and B slices
- CABAC/CAVLC
- Interlace Coding – PAFF, MBAFF
- 4x4, 8x8 transform
- Weighted prediction, ½ and ¼ pixel interpolation
- Quantization scaling matrices
- Separate Cb and Cr QP control
- FMO, ASO, Redundant Slices
- Deblocking loop filter

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Performance

Ace Thought's Multi-threaded H.264 decoder processing requirement is measured in millions of cycles per second (MHz). The Table 1 below summarizes the MHz for Single-Threaded H.264 decoder on single core ARM Cortex-A9 application processor with NEON™ Advanced SIMD and DDR2 RAM.

Table 1. Performance Benchmark Numbers for Single Core ARM Cortex-A9

Profile	Resolution	Bit-Rate	Frame-Rate	MHz *(Single-Threaded)*
Baseline	640x480	2Mbps	24fps	240
Baseline	720x480	2Mbps	24fps	256
Baseline	1280x720	4Mbps	24fps	753
Baseline	1920x1080	4Mbps	24fps	1408
Main	640x480	2Mbps	24fps	484
Main	720x480	2Mbps	24fps	513
Main	1280x720	4Mbps	24fps	1463
High	640x480	2Mbps	24fps	496
High	720x480	2Mbps	24fps	524
High	1280x720	4Mbps	24fps	1511

The Table 2 below summarizes the MHz for Dual-Threaded H.264 decoder on dual core ARM Cortex-A9 application processor with NEON™ Advanced SIMD and DDR2 RAM.

Table 2. Performance Benchmark Numbers for Dual Core ARM Cortex-A9

Profile	Resolution	Bit-Rate	Frame-Rate	MHz *(Dual-Threaded)*
Baseline	1280x720	4Mbps	24fps	506
Baseline	1920x1080	4Mbps	24fps	935
Main	1280x720	4Mbps	24fps	882
Main	1280x544	6Mbps	24fps	589
High	1280x720	4Mbps	24fps	892
High	1280x528	3Mbps	24fps	658

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