



Hantro Multimedia Technology: The Mobile Video Experts

SOLUTION SUMMARY

Challenge

The Finnish company, Hantro, creates complete multimedia solutions for handheld devices. Established in 1992, Hantro is headquartered in Oulu, Finland, and has offices in Espoo, Finland; Tokyo, Japan; Seoul, South Korea; and Saratoga, California USA.

The company's core products are MPEG-4/H.263 and H.264 video codecs in both hardware and software formats. Hantro also offers all the application software needed, including the GUI. Encoding and decoding video in software is a compute-intensive task, and the resources available for processing imposed limitations on the achievable resolution and frame rate.

Solution

The Intel® PXA27x processor family offers an ideal solution for the Hantro codecs. Featuring Intel® Wireless MMX™ technology, the Intel PXA27x processor delivers the speed needed to deliver significantly higher resolutions.

Key Features

- Intel Wireless MMX technology optimizes Hantro implementations.
- With up to 624-MHz capability, Hantro is currently running at 520 MHz.
- Memory enhancements and the intelligent bus transfer arbiter were provided in the eLinux* OS default settings.
- Intel® VTune™ analyzer defined areas of the decoder to be optimized.
- Intel® Software Development Tools enabled the entire implementation.

Business Objectives

Hantro uses a variety of ARM7* and ARM9* core-based processors, StrongARM*, and processors based on Intel XScale® technology for their codec products.

High compression ratios are achieved by Hantro applications in MPEG video by identifying blocks of data in consecutive frames, then transmitting only the first block. The position of the block in subsequent images can then be determined and reconstructed.

"Video compression/decompression requires very complex calculations," said Sami Niska, product manager. "The ability to speed up processing of the algorithms allows us to achieve a significantly higher resolution and faster frame rates."

The convergence of video applications in mobile devices is pushing resolution requirements higher and higher. To partner their hardware codec implementations more effectively, Hantro was looking for a solution that would increase capabilities in their software codecs, while providing greater flexibility and time-to-market advantages.

"The Intel representatives offered us the opportunity to take advantage of the new capabilities in the Intel PXA27x processor and achieve the performance we needed," said Niska. "This has given us the ability to provide the mobile device industry with a fast, high-performance software solution for video that is also easy to implement."

Business Solution

"The Intel PXA27x processor family is an excellent processor from a performance standpoint," said Niska. "The core clock speed can be set high, and the Intel® Wireless MMX™ instructions have given us the ability to enhance our products with ease."

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Product Manager
Hantro

The Hantro 4100i decoder can now decode MPEG4/H.263 at VGA resolution, delivering 30 frames per second performance. The close interaction with the Intel technical team offered the level of technical guidance Hantro was looking for.

Hantro engineers used the Intel VTune analyzer to identify areas of the decoder that needed optimization, and the Intel Wireless MMX instructions were used to optimize motion compensation and Inverse Discrete Cosine Transform (IDCT) implementations.

As a member of the Intel® PCA Developer Network, Hantro was able to take advantage of a variety of development tools and technical support throughout the process. The Intel Software Development Tools (SDT) proved to be an essential element in Hantro's adoption of the Intel PXA27x processor family.

"Since we began using the Intel PXA27x processor, we've seen a 30 percent gain in performance with the Intel Wireless MMX technology," said Niska. "Increasing the clock speed from 400 MHz to 520 MHz provided a 10 percent performance enhancement."

"The power of the Intel PXA27x processor family has enabled an unprecedented level of performance for our MPEG-4/H.263 and H.264 software codecs," said Eero Kaikkonen, president and CEO. "The Intel PXA27x processor delivered exactly the performance we were hoping for."

Intel Access

Developer Web Site

developer.intel.com

Intel® PCA Processors Home Page

developer.intel.com/design/pca/applicationsprocessors/index.htm

Intel® Technical Documentation Center

intel.com/go/techdoc

800 548-4725 7 am-7 pm CST (USA and Canada)

General Information Hotline

800 628-8686 or 916 356-3104 5 am-5 pm PST

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The Intel Advantage

- **Power and performance**—the Intel PXA27x processor delivers the speed and robust features Hantro products need, without compromising on the important power savings that wireless devices demand.
- **Technical support**—as a member of the Intel PCA Developer Network, Hantro has full access to Intel technical representatives, as well as the Intel Wireless Competence Center in Stockholm, Sweden.
- **Faster time-to-market**—because the Intel PXA27x processor is standardized on multiple OS, Hantro has fast access to critical features in the eLinux OS.
- **Intel® Trusted Platform**—hardware and software components that provide security services such as trusted boot, secure storage of private information, and support for leading-edge security protocols.
- **Software**—Intel offers software development tools to enable system and application developers to take full advantage of the Intel PXA27x processor family. Intel offers several versions of its Intel® C++ Compiler, Intel® Integrated Performance Primitives and the Intel VTune Performance Analyzer.

For more information

www.intel.com/go/wirelessmobility