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Intel Launches Low-Power, High-Performance Silvermont Microarchitecture

NEWS HIGHLIGHTS:

- Intel announces Silvermont microarchitecture, a new design in Intel's 22nm Tri-Gate SoC process delivering significant increases in performance and energy efficiency.
- Silvermont microarchitecture delivers ~3x more peak performance or the same performance at ~5x lower power over current-generation Intel® Atom™ processor core.[1]
- Silvermont to serve as the foundation for a breadth of 22nm products targeted at tablets, smartphones, microservers, network infrastructure, storage and other market segments including entry laptops and in-vehicle infotainment.

SANTA CLARA, Calif.--(BUSINESS WIRE)-- Intel Corporation today took the wraps off its brand new, low-power, high-performance microarchitecture named Silvermont.

The technology is aimed squarely at low-power requirements in market segments from smartphones to the data center. Silvermont will be the foundation for a range of innovative products beginning to come to market later this year, and will also be manufactured using the company's leading-edge, 22nm Tri-Gate SoC manufacturing process, which brings significant performance increases and improved energy efficiency.

"Silvermont is a leap forward and an entirely new technology foundation for the future that will address a broad range of products and market segments," said Dadi Perlmutter, Intel executive vice president and chief product officer. "Early sampling of our 22nm SoCs, including "Bay Trail" and "Avoton" is already garnering positive feedback from our customers. Going forward, we will accelerate future generations of this low-power microarchitecture on a yearly cadence."

The Silvermont microarchitecture delivers industry-leading performance-per-watt efficiency.[2] The highly balanced design brings increased support for a wider dynamic range and seamlessly scales up and down in performance and power efficiency. On a variety of standard metrics, Silvermont also enables ~3x peak performance or the same performance at ~5x lower power over the current-generation Intel® Atom™ processor core.[1]

Silvermont: Next-Generation Microarchitecture

Intel's Silvermont microarchitecture was designed and co-optimized with Intel's 22nm SoC process using revolutionary 3-D Tri-gate transistors. By taking advantage of this industry-leading technology, Intel is able to provide a significant performance increase and improved energy efficiency.

Additional highlights of the Silvermont microarchitecture include:

- A new out-of-order execution engine enables best-in-class, single-threaded performance.[1]
- A new multi-core and system fabric architecture scalable up to eight cores and enabling greater performance for higher bandwidth, lower latency and more efficient out-of-order support for a more balanced and responsive system.
- New IA instructions and technologies bringing enhanced performance, virtualization and security management capabilities to support a wide range of products. These instructions build on Intel's existing support for 64-bit and the breadth of the IA software installed base.
- Enhanced power management capabilities including a new intelligent burst technology, low-power C states and a wider dynamic range of operation taking advantage of Intel's 3-D transistors. Intel® Burst Technology 2.0 support for single- and multi-core offers great responsiveness scaled for power efficiency.

"Through our design and process technology co-optimization we exceeded our goals for Silvermont," said Belli Kuttanna, Intel Fellow and chief architect. "By taking advantage of our strengths in microarchitecture development and leading-edge process technology, we delivered a technology package that enables significantly improved performance and power efficiency – all while delivering higher frequencies. We're proud of this accomplishment and believe that Silvermont will offer a strong and flexible foundation for a range of new, low-power Intel SoCs."

Architecting Across a Spectrum of Computing

Silvermont will serve as the foundation for a breadth of 22nm products expected in market later this year. The performance-per-watt improvements with the new microarchitecture will enable a significant difference in performance and responsiveness for the compute devices built around these products.

Intel's quad-core "Bay Trail" SoC is scheduled for holiday 2013 tablets and will more than double the compute performance capability of Intel's current-generation tablet offering[1]. Due to the flexibility of Silvermont, variants of the "Bay Trail" platform will also be used in market segments including entry laptop and desktop computers in innovative form factors.

Intel's "Merrifield" is scheduled to ship to customers by the end of this year. It will enable increased performance and battery life over current-generation products[1] and brings support for context aware and personal services, ultra-fast connections for Web streaming, and increased data, device and privacy protection.

Intel's "Avoton" will enable industry-leading energy efficiency and performance-per-watt for microservers[2], storage and scale out workloads in the data center. "Avoton" is Intel's second-generation Intel® Atom™ processor SoC to provide full server product capability that customers require including 64-bit, integrated fabric, error code correction, Intel virtualization technologies and software compatibility. "Rangeley" is aimed at the network and communication infrastructure, specifically for entry-level to mid-range routers, switches and security appliances. Both products are scheduled for the second half of this year.

Concurrently, Intel is delivering industry-leading advancements on its next-generation, 22nm Haswell microarchitecture for Intel® Core™ processors to enable full-PC performance at lower power levels for innovative “2-in-1” form factors, and other mobile devices available later this year. Intel also plans to refresh its line of Intel® Xeon® processor families across the data center on 22nm technology, delivering better performance-per-watt and other features.

“By taking advantage of both the Silvermont and Haswell microarchitectures, Intel is well positioned to enable great products and experiences across the full spectrum of computing,” Perlmutter said.

About Intel

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[1] Based on the geometric mean of a variety of power and performance measurements across various benchmarks. Benchmarks included in this geomean are measurements on browsing benchmarks and workloads including SunSpider* and page load tests on Internet Explorer*, FireFox*, & Chrome*; Dhrystone*; EEMBC* workloads including CoreMark*; Android* workloads including CaffineMark*, AnTutu*, Linpack* and Quadrant* as well as measured estimates on SPECint* rate_base2000 & SPECfp* rate_base2000; on Silvermont preproduction systems compared to Atom processor Z2580. Individual results will vary. SPEC* CPU2000* is a retired benchmark. *Other names and brands may be claimed as the property of others.

[2] Based on a geometric mean of the measured and projected power and performance of SPECint* rate_base2000 on Silvermont compared to expected configurations of main ARM*-based mobile competitors using descriptions of the architectures; assumes similar configurations. Numbers may be subject to change once verified with the actual parts. Individual results will vary. SPEC* CPU2000* is a retired benchmark; results are estimates. *Other names and brands may be claimed as the property of others.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to: www.intel.com/performance.

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