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# Intel Demonstrates Industry's First 32nm Chip and Next-Generation Nehalem Microprocessor Architecture

SAN FRANCISCO--(BUSINESS WIRE)--

Intel Corporation President and CEO Paul Otellini today outlined new products, chip designs and manufacturing technologies that will enable the company to continue its quickened pace of product and technology leadership.

Speaking to industry leaders, developers and industry watchers at the Intel Developer Forum (IDF), Otellini showed the industry's first working chips built using 32 nanometer (nm) technology, with transistors so small that more than 4 million of them could fit on the period at the end of this sentence. Intel's 32nm process technology is on track to begin production in 2009.

Otellini also described the near-term advantages computer users will experience with Intel's upcoming 45nm family of Penryn processors, which are based on its revolutionary high-k metal gate transistor technology. The industry's first 45nm processors will be available from Intel in November. The company also demonstrated for the first time the next-generation chip architecture codenamed Nehalem, due out next year.

"Our tick-tock strategy of alternating next generation silicon technology and a new microprocessor architecture -- year after year -- is accelerating the pace of innovation in the industry," said Otellini. "Tick-tock is the engine creating today's most advanced technologies and keeps them coming out at a rapid cadence. Our customers and computer users around the world can count on Intel's innovation engine and manufacturing capability to deliver state-of-the-art performance that rapidly becomes mainstream."

When Intel introduces Penryn in November, it will be the world's first high-volume 45nm processor. Penryn, along with the Silverthorne family of 45nm processors (available next year) will have the small feature size, low-power requirements and high-performance capabilities to meet a wide variety of computing needs from handheld Internet computers to high-end servers. Intel will quickly ramp the technology with plans to introduce 15 new 45nm processors by the end of the year and another 20 in the first quarter of 2008, extending Intel's leadership in product performance and energy efficiency. Intel has already achieved more than 750 design wins for the Penryn processor.

"We expect our Penryn processors to provide up to a 20 percent performance increase while improving energy efficiency," said Otellini. "Intel's breakthrough 45nm silicon process technology allows us to provide low-cost, extremely low-power processors for innovative small form factor devices while delivering high-performance, multi-core, multi-featured processors used in the most advanced systems."

Otellini also announced that Intel's 45nm processors and 65nm chipsets would use halogen-free packaging technology beginning in 2008. The result will be that Intel's 45nm processors will not only be more energy efficient but also better for the environment.

Looking to 2008, Otellini made the first public demonstration of Intel's Nehalem processor and said the company is on track to deliver the new processor design in the second half of the year. The Nehalem architecture will extend Intel's leadership in performance and performance-per-watt benchmarks, and will be the first Intel processor to use the QuickPath Interconnect system architecture. QuickPath will include integrated memory controller technology and improved communication links between system components to significantly improve overall system performance.

"Nehalem is an entirely new architecture that leverages Intel's Core Microarchitecture, bringing leading-edge performance advantages, power efficiency and important new server features to market just a year after Intel leads the industry to 45nm technology," said Otellini.

Describing other advanced Intel technologies destined to quickly come to market, Otellini showed the world's first 300mm wafer built using next-generation 32nm process technology. The development of advanced test chips serves as a critical milestone in the company's march toward high-volume manufacturing of 32nm process technology. With plans to introduce processors built on 32nm technology in 2009, Intel will maintain its industry lead delivering the most advanced manufacturing technologies.

Intel's 32nm test chips incorporate logic and memory (static random access memory -- SRAM) to house more than 1.9 billion transistors. The 32nm process uses the company's second-generation high-k and metal gate transistor technology.

This additional performance made possible by Intel's push to drive chip design and manufacturing technology forward will not only be seen in computing, but will enable more true-to-life entertainment and realistic graphics capabilities. As a result, the company said it will be placing increased emphasis on using the power of its processors to enhance key technologies such as visual computing and graphics.

"Satisfying demand for ever-greater computer performance increases means we need to move rapidly to the next manufacturing technology," said Otellini. "Intel engineers and researchers deserve a great deal of credit for setting the pace for the industry. As our advanced technology reaches consumers and businesses in the next couple of years the amount of computing power they'll be able to harness will help them become even more productive, creative and innovative."

Otellini also announced that a version of a Penryn dual-core processor operating at 25 watts will be available on the upcoming Montevina platform, which will include Intel's mobile WiMAX silicon. Several equipment manufacturers are already planning to introduce Montevina-based notebook PCs starting next year when the platform is introduced. Overall, WiMAX is expected to reach more than 1 billion people worldwide by 2012.

The reach of WiMAX along with Intel's efforts to bring computing technology to developing nations through the World Ahead program and innovative products such as the Silverthorne processor will help bring computing to the next billion people worldwide according to Intel.

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