Intel President and CEO Paul Otellini outlined the company's plan to accelerate its technology leadership and told thousands of developers and engineers gathered here that advances in silicon technology will deliver new performance breakthroughs in an era of energy-efficient computing. Otellini also disclosed that Intel will ship the world's first quad-core processors for PCs and high-volume servers in November and provided new details related to Intel's industry-leading 65nm and 45nm manufacturing technologies. The industry is going through the most profound shift in decades, moving into an era where performance and energy efficiency are critical in all market segments and all aspects of computing, Otellini said. The solution begins with the transistor and extends to the chip and platform levels. Citing recent trends, Otellini showed how processing power is becoming more relevant than ever. The advent of new operating systems, more lifelike games, online video and high-definition video continue to drive the need for more processing power. A single YouTube stream today will hobble a PC from just a few years ago, said Otellini. As we move to high definition video, users will need eight times greater performance just for encoding. More than ever processing power matters, even as the need to reduce heat, extend battery life, and reduce electricity costs in data centres becomes more critical, said Otellini. Silicon technology is at the heart of the solution. It is how we get there. Intel Core Microarchitecture Products When it comes to performance and energy efficiency, Intel's new Core micro-architecture and flagship Intel Core2 Duo processor have set a new standard for the industry, Otellini said. He showed where Core2 Duo benchmarks led across a wide range of applications and said it was now the fastest-ramping product in the company's history, with 5 million units shipped since it was introduced less than 60 days ago. With Core2 Duo we have the best performance, from the thinnest notebook to dual processor servers, and we are very pleased with the way this product is ramping. Otellini went on to discuss new details around the company's plan for delivering the industry's first quad core processors for PCs and high-volume servers. The first processor, targeted at gamers and content creators, will be shipped in November and be called the Intel Core2 Extreme quad-core processor. It will feature a dramatic 67 per cent performance improvement over todays Intel Core2 Extreme processor.* The company's mainstream quad-core processor will be shipped in the first quarter of 2007 and will be called the Intel Core2 Quad processor. For servers, the Quad-Core Intel Xeon processor 5300 series brand for dual processor servers will be shipped this year, and a new low-power 50-watt Quad-Core Intel Xeon processor L5310 for blade servers that will be shipped in the first quarter of 2007. Silicon Process and Manufacturing Technology Performance and energy efficiency all start with the transistor he said, describing Intel's legacy of advancing Moore's Law and its industry-leading silicon technology and manufacturing capability. Intel was the first to implement advanced 65nm silicon manufacturing technology in 2005, integrating power-saving features into the process that were critical to delivering power-efficiency at the transistor level. Otellini said the company is now officially shipping the majority of its processors on 65nm, before any other company had even shipped a single production unit. Looking ahead, Intels next-generation 45nm technology is on track for production in the second half of 2007 as planned, and Otellini disclosed for the first time that the company has 15 45nm products already in development across desktop, mobile, and enterprise segments. The first of these products is on track to complete its design in the fourth quarter of this year. He described the company's extensive 45-nm factory network with more than 500,000 square feet of clean room space and more than US$9 billion invested. Sustained Leadership Otellini estimated that the cadence of these manufacturing process technologies which follow Moore's Law, coupled with Intels plans to introduce new micro-architectures about every two years, will result in significant performance-per-watt improvement over todays Core micro-architecture products by 2010. He showed a chart that mapped out new micro-architectures coming in 2008 (code-named Nehalem and targeted at 45nm) followed by another in 2010 (code-named Gesher and targeted at 32nm). These new micro architectures will be developed by separate teams working in parallel, and targeted for intersection with specific future process technologies. By the end of the decade we will deliver a 300 per cent increase in performance per watt over todays processors, he said. This improved power and performance will enable developers and manufacturers to develop systems with incredibly exciting new capabilities. To demonstrate how Moore's Law will continue well into the future with amazing potential, Otellini showed a new research prototype processor that has 80 simple floating point cores on a single die. The tiny silicon die on this experimental chip, just 300mm, is capable of achieving a Teraflop of performance, or 1 trillion floating point operations per second. He contrasted this with Intels historic breakthrough 11 years ago with the worlds first Teraflop supercomputer, a massive machine powered by nearly 10,000 Pentium Pro processors in more than 85 large cabinets occupying about 2,000 square feet. Innovation and the Intel Core 2 Challenge In the first ever appearance of an Apple executive at IDF, Otellini was joined on stage by Phil Schiller, Apples senior vice president of Worldwide Product Marketing who discussed how Apple has been able to innovate with sleek form factors and leverage the Intel Core family of processors across their entire computing product line. Rackable CEO Thomas Barton also joined Otellini to talk about how his company is accelerating a significant shift to the Intel Core Microarchitecture, starting with the Dual-Core Intel Xeon Processor 5100 Series that began shipping in July. Barton also showed a system featuring what he said was a new a record - 320 cores in a single 22 unit high server rack - using the upcoming Quad-Core Intel Xeon 5300 series processors. On innovation, Otellini challenged the computing and consumer electronics industry to do more, to take advantage of the energy-efficient performance capabilities of Core 2 Duo processors. To do this, Otellini announced the
Intel Core Processor Challenge, a contest that will award up to US$1 million in prizes to the PC designer or manufacturer that builds the smallest and most stylish PCs powered by an Intel Core 2 Duo processor coupled with Intel Viiv technology, Intel's premium brand for in-home, media-optimised PCs. New Growth Opportunities

Otellini also summarised the progress the company was seeing on its Intel Viiv technology and Intel Centrino mobile technology platforms, and said the next-generation mobile platform codenamed Santa Rosa is on track to ship next year. He said the next big inflection point for the industry is clearly broadband to go or carrying broadband Internet with you. In this regard Intel is making significant progress with its WiMax effort, he said, bolstered by the recent news that Sprint and Clearwire would deploy the technology. The company is also working on a new category of PCs known as the ultra-mobile PC, which Otellini said could result in devices with 10 times lower power consumption than today's laptops by 2008.

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