



# Fact Sheet

## 2011 Year-In-Review

### The Rise of the ‘Cloud,’ 3-D Transistors, Ultrabook™ and Emerging Markets

#### **1) The Re-Invention of the Transistor: Intel’s 3-D Tri-Gate Transistors**

For the first time since the invention of silicon transistors over 50 years ago, transistors using a 3-D structure will be put into high-volume manufacturing. In May, Intel announced a significant breakthrough and historic innovation: the 3-D Tri-gate transistor. Intel’s transistors represent a fundamental departure from the two-dimensional planar transistor structure that has powered not only all computers, mobile phones and consumer electronics to-date, but also the electronic controls within cars, spacecraft, household appliances, medical devices and thousands of other everyday devices for decades. Intel’s new 3-D Tri-gate transistors will continue the pace of technology development, fueling Moore’s Law for years to come, providing an unprecedented combination of performance improvement and power reduction benefits. These advancements are expected to enable new innovations across a broad range of devices, from the smallest handhelds to powerful cloud-based servers. The first micro-architecture to take advantage of this revolutionary transistor design will be 3rd Generation Intel® Core™ processors, codenamed “Ivy Bridge,” which will power the next generation of Ultrabooks and PCs worldwide and will be introduced in the first half of 2012.

#### **2) Ultrabook™: The Next Big Thing?**

In the world of mobile gadgets, this is really “in.” Intel’s unveiling in June of a new category of device, called Ultrabook™, generated excitement across the technology industry about the future prospects for mobile computing. Intel expects the Ultrabook device to be as transformational to mobile computing as Intel® Centrino® Mobile technology was when it helped popularize WiFi-enabled laptops. Ultrabook devices will arrive in three phases over the next three years, each adding more must-have features like touch, longer battery life and in thinner designs and styles, ultimately delivering the most complete and satisfying computing experience. First generation Ultrabook systems are ultra-responsive, ultra-sleek, offer excellent battery life and enhanced security-enabled features, and are available at a variety of price points, many under \$1,000. Four companies – Acer Group\*, Asustek\*, Lenovo Group\* and Toshiba Corp.\* – have announced and some are already shipping Ultrabook products that are available now, with more expected in 2012 from additional manufacturers.

#### **3) Big Data + Cloud Computing = Big Business**

While cloud computing started gaining notice last year, 2011 was the year that cloud computing and “big data” became big business. According to Cisco<sup>1</sup>, more data – 345 quintillion bytes to be exact -- crossed the Web in 2010 than all other years combined. This eye-popping explosion of

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<sup>1</sup> Cisco Visual Networking Index: Forecast and Methodology, 2010-2015, June 1, 2011

data is expected to continue, leaving companies and individuals searching for simple ways to store, manage and access this flood of information.

Kirk Skaugen, Intel vice president and general manager of the Datacenter and Connected Systems Group, told the audience at the Web 2.0 Summit in November that the server market segment, which has more than doubled in the past 10 years to include approximately 16 million chips, will double again in the next 5<sup>2</sup>.

“Today we’re talking 4 billion connected devices, 15 billion by 2015, and 50 billion by 2020,” added Skaugen, whose organization is on track to generate \$10 billion in revenues this year. “Our vision is very simple: if it consumes electricity, it’s going to end up computing, and if it’s computing it will be connected to the Internet.”

EMC\*, HP\*, IBM\*, Intel\* and Oracle\* collectively invested billions this year to acquire smaller firms to expand their cloud computing capabilities. Intel, for example, acquired [Fulcrum Microsystems\\*](#), an Ethernet switch silicon provider, to advance its strategy to deliver comprehensive building blocks across the data center, from servers to storage and networking. Intel is also delivering continued innovation with its [Intel® Xeon® Processor E7 family](#), where a single rack of servers could replace 18 older dual-core Intel servers and run on 93 percent less energy<sup>3</sup>.

#### **4) The Rise of Emerging Markets**

Two emerging markets economic powers took the world by surprise when they reshaped the global PC marketplace this year. China became the world’s top PC consumption market during the second quarter, while Brazil pushed ahead of Japan to become No. 3, according to research firm IDC<sup>4</sup>\*. This shift benefited global computer and microprocessor companies with a strong presence in emerging markets, such as Intel and Lenovo Group\*. For example, emerging markets helped fuel double-digit revenue growth for Intel each quarter this year. Intel reported consumer PC demand in emerging markets rose year-over-year during the [third quarter](#), with China up 12 percent, India up 21 percent, Turkey up 14 percent, and Indonesia up 23 percent.

#### **5) Intel Bucks Trend: Continues Expansion of U.S. Manufacturing Operations**

This year, Intel broke ground on two new chip manufacturing facilities in the United States, which will help maintain the U.S. semiconductor industry’s status as the country’s leading exporter when averaged over the past 5 years. Fab D1X in Hillsboro, Ore., will be the first 14-nanometer microprocessor factory in the world and will have a cleanroom as big as four American football fields. The [\\$5 billion Fab 42](#) in Chandler, Ariz., will be Intel’s most advanced high-volume semiconductor manufacturing facility in the world when completed in 2013.

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<sup>2</sup> Source: IDC WW Server Tracker (1995-2004 systems data) and internal analysis; 2005-2010 Intel shipments; 2011-2015 DCSG forecast.

<sup>3</sup> Source: Intel measurements as of March 2011 of Xeon E7-4800 and dual 4-socket systems. Performance comparison using PECint\_rate\_base2006. Results have been estimated based on internal Intel analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance. For detailed calculations, configurations and assumptions refer to the legal information slide in backup. 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.

<sup>4</sup> IDC Worldwide Quarterly PC Tracker, August 23, 2011

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After visiting Intel's campus in Hillsboro, Ore., U.S. President Barack Obama devoted part of his Feb. 19 [weekly address](#) to Intel's efforts to invest in America: "But even as global competition has intensified, this company has invested, built, and hired in America. Three-quarters of Intel's products are made by American workers. And as the company expands operations in Oregon and builds a new plant in Arizona, it plans to hire another 4,000 people this year. Companies like Intel are proving that we can compete – that instead of just being a nation that buys what's made overseas, we can make things in America and sell them around the globe."

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