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Intel Unveils New Technologies for Efficient Cloud Datacenters

From New SoCs to Optical Fiber, Intel Delivers Cloud-Optimized Innovations Across Network, Storage, Microservers, and Rack Designs

NEWS HIGHLIGHTS

- The Intel® Atom™ C2000 processor family is the first based on Silvermont micro-architecture, has 13 customized configurations and is aimed at microservers, entry-level networking and cold storage.
- New 64-bit, system-on-chip family for the datacenter delivers up to six times[1] the energy efficiency and up to seven times[2] the performance compared to previous generation.
- The first live demonstration of a Rack Scale Architecture-based system with high-speed Intel® Silicon Photonics components including a new MXC connector and ClearCurve* optical fiber developed in collaboration with Corning*, enabling data transfers speeds up to 1.6 terabits[4] per second at distances up to 300 meters[5] for greater rack density.

SAN FRANCISCO--(BUSINESS WIRE)-- Intel Corporation today introduced a portfolio of datacenter products and technologies for cloud service providers looking to drive greater efficiency and flexibility into their infrastructure to support a growing demand for new services and future innovation.

Server, network and storage infrastructure is evolving to better suit an increasingly diverse set of lightweight workloads, creating the emergence of microserver, cold storage and entry networking segments. By optimizing technologies for specific workloads, Intel will help cloud providers significantly increase utilization, drive down costs and provide compelling and consistent experiences to consumers and businesses.

The portfolio includes the second generation 64-bit Intel® Atom™ C2000 product family of system-on-chip (SoC) designs for microservers and cold storage platforms (code named “Avoton”) and for entry networking platforms (code named “Rangeley”). These new SoCs are the company’s first products based on the Silvermont micro-architecture, the new design in its leading 22nm Tri-Gate SoC process delivering significant increases in performance and energy efficiency, and arrives only nine months after the previous generation.

“As the world becomes more and more mobile, the pressure to support billions of devices and users is changing the very composition of datacenters,” said Diane Bryant, senior vice president and general manager of the Datacenter and Connected Systems Group at Intel. “From leadership in silicon and SoC design to rack architecture and software enabling, Intel

is providing the key innovations that original equipment manufacturers, telecommunications equipment makers and cloud service providers require to build the datacenters of the future."

Intel also introduced the Intel® Ethernet Switch FM5224 silicon which, when combined with the WindRiver Open Network Software suite, brings Software Defined Networking (SDN) solutions to servers for improved density and lower power.

Intel also demonstrated the first operational Intel Rack Scale Architecture (RSA)-based rack with Intel® Silicon Photonics Technology in combination with the disclosure of a new MXC connector and ClearCurve* optical fiber developed by Corning* with requirements from Intel. This demonstration highlights the speed with which Intel and the industry are moving from concept to functionality.

Customized, Optimized Intel® Atom™ SoCs for New and Existing Market Segments

Manufactured using Intel's leading 22nm process technology, the new Intel Atom C2000 product family features up to eight cores, a range of 6 to 20Watts TDP, integrated Ethernet and support for up to 64 gigabytes (GB) of memory, eight times the previous generation. OVH* and 1&1, leading global web-hosting services companies, have tested Intel Atom C2000 SoCs and plan to deploy them in its entry-level dedicated hosting services next quarter. The 22 nanometer process technology delivers superior performance and performance per watt.

Intel is delivering 13 specific models with customized features and accelerators that are optimized for particular lightweight workloads such as entry dedicated hosting, distributed memory caching, static web serving and content delivery to ensure greater efficiency. The designs allow Intel to expand into new markets like cold storage and entry-level networking.

For example, the new Intel Atom configurations for entry networking address the specialized needs for securing and routing Internet traffic more efficiently. The product features a set of hardware accelerators called Intel® QuickAssist Technology that improves cryptographic performance. They are ideally suited for routers and security appliances.

By consolidating three communications workloads – application, control and packet processing – on a common platform, providers now have tremendous flexibility. They will be able to meet the changing network demands while adding performance, reducing costs and improving time-to-market.

Ericsson, a world-leading provider of communications technology and services announced that its blade-based switches used in the Ericsson Cloud System, a solution which enables service providers to add cloud capabilities to their existing networks, will soon include the Intel Atom C2000 SoC product family.

Microserver-Optimized Switch for Software Defined Networking

Network solutions that manage data traffic across microservers can significantly impact the performance and density of the system. The unique combination of the Intel Ethernet Switch FM5224 silicon and the WindRiver Open Network Software suite will enable the industry's first 2.5GbE, high-density, low latency, SDN Ethernet switch solutions specifically developed for microservers. The solution enhances system level innovation, and complements the

integrated Intel Ethernet controller within the Intel Atom C2000 processor. Together, they can be used to create SDN solutions for the datacenter.

Switches using the new Intel Ethernet Switch FM5224 silicon can connect up to 64 microservers, providing up to 30 percent[3] higher node density. They are based on Intel Open Network Platform reference design announced earlier this year.

First Demonstration of Silicon Photonics-Powered Rack

Maximum datacenter efficiency requires innovation at the silicon, system and rack level. Intel's RSA design helps industry partners to re-architect datacenters for modularity of components (storage, CPU, memory, network) at the rack level. It provides the ability to provision or logically compose resources based on application specific workload requirements. Intel RSA also will allow for the easier replacement and configuration of components when deploying cloud computing, storage and networking resources.

Intel today demonstrated the first operational RSA-based rack equipped with the newly announced Intel Atom C2000 processors, Intel® Xeon® processors, a top-of-rack Intel SDN-enabled switch and Intel Silicon Photonics Technology. As part of the demonstration, Intel also disclosed the new MXC connector and ClearCurve* fiber technology developed by Corning* with requirements from Intel. The fiber connections are specifically designed to work with Intel Silicon Photonics components.

The collaboration underscores the tremendous need for high-speed bandwidth within datacenters. By sending photons over a thin optical fiber instead of electrical signals over a copper cable, the new technologies are capable of transferring massive amounts of data at unprecedented speeds over greater distances. The transfers can be as fast as 1.6 terabits per second[4] at lengths up to 300 meters[5] throughout the datacenter.

To highlight the growing range of Intel RSA implementations, Microsoft and Intel announced a collaboration to innovate on Microsoft's next-generation RSA rack design. The goal is to bring even better utilization, economics and flexibility to Microsoft's datacenters.

The Intel Atom C2000 product family is shipping to customers now with more than 50 designs for microservers, cold storage and networking. The products are expected to be available in the coming months from vendors including Advantech*, Dell*, Ericsson*, HP*, NEC*, Newisys*, Penguin Computing*, Portwell*, Quanta*, Supermicro*, WiWynn*, ZNYX Networks*.

More information on the announcements including Diane Bryant's presentation, additional documents and pictures are available at http://newsroom.intel.com/docs/DOC-4267.

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[1] Performance based on Dynamic Web Benchmark Performance: Atom S1260 (8GB, SSD, 1GbE), Score=1522. Atom C2750(32GB, SSD,10GbE), Score=11351.

[2] Performance per Watt based on Dynamic Web Benchmark: Atom S1260 (8GB,SSD, 1GbE), Score=1522, est node power=20W, PPW=76.1 Atom C2730(32GB, SSD,10GbE), Score=8778, est node power=19W, PPW=462. Source: Intel Internal measurements as of August 2013. Refer to backup for additional details.

[3] Based on 2.5G port count compared to the BCM56540

[4] Measured per fiber bandwidth on an Agilent Bit Error Rate Tester (BERT) that included a N4960A-CJ1 controller, N4951A-H32 pattern generator and N4952A-E32 error detector. MXC connector used had 32 fibers for an actual data rate of .8 tera-bits. Mechanical models and CAD simulations show that the MXC can accommodate up to 64 fibers for a theoretical total bandwidth of 1.6 Tera-bits per second.

[5] ClearCurve fiber operating at 300 meters was tested using 300 meters of new ClearCurve fiber connected to an Agilent Bit Error Rate Tester (BERT) that included a N4960A-CJ1 controller, N4951A-H32 pattern generator and N4952A-E32 error detector.

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.

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