Maximize Efficiency for Your Lightweight Scale-Out Workloads

Extreme Density and Energy-Efficiency for Low-End, Scale-Out Workloads

With a need to rapidly deliver new services, cope with massive data growth, and contain costs, cloud service providers and hosters seek increasingly efficient ways to handle the demands on their infrastructure. Today's servers based on Intel® Xeon® processors provide leadership performance and performance per watt with the flexibility to handle a wide range of workloads and peak demands. However, certain lightweight, scale-out workloads—such as basic dedicated hosting, low-end static web serving, and simple content delivery can sometimes be hosted more efficiently on larger numbers of smaller servers built for extreme power efficiency.

To address this need, Intel worked with a broad ecosystem of leading server manufacturers to develop and deliver a variety of extreme low-power systems to support an emerging server category—microservers. With up to a 1,000 nodes[1] per rack and shared power, cooling, and networking resources, microservers can help you improve data center efficiency by right-sizing infrastructure for relatively light processing requirements.

The Intel® Atom™ processor C2000 product family delivers a major leap forward for microserver performance and efficiency. This second-generation, 64-bit system-on-a-chip (SoC) delivers up to seven times the performance of the previous-generation Intel® Atom™ processor S1200 product family,[2] while improving performance per watt by up to four times.[3] It offers more cores, memory capacity, and I/O resources, and comes with a power envelope as low as 5 watts. It also provides increased platform flexibility with integrated Gigabit Ethernet (GbE), SATA, and USB ports.

The Intel Atom processor C2000 product family joins the Intel® Xeon® processor E3 v3 product family to power the next generation of microservers across a range of lightweight web-scale workload requirements. Intel Atom processor C2000 series provide datacenter class features including support for 64-bit computing,[4] Intel® Virtualization Technology,[5] and Error Correcting Code (ECC) memory.[6] They also support the industry-standard x86 instruction set, so they provide complete software compatibility with mainstream servers,

giving you the flexibility to right-size your infrastructure without limiting software mobility and interoperability as your applications evolve.

Optimized Platform Support

Intel provides complete microserver platform solutions that simplify implementation, improve overall efficiency and enable higher node density. New innovations include:

- **Simplified Manageability.** With a new Intel enabled companion chip, four microserver nodes can now be managed using a single Management Module Controller to reduce chip counts and platform power and to improve density. Power can be monitored and controlled at the node, platform, rack, and data center levels using Core Running Average Power Limiting (RAPL) capability.

- **Improved Memory Density.** A new compact connector allows memory DIMMs to be stacked on top of each other to save space on the board and provide a path toward even higher density.

- **ONP Optimized SDN Chassis-Level Switch.** The Intel® FM5224 Ethernet Switch brings Software Defined Networking (SDN) benefits providing better workload traffic control, Quality of Service, bandwidth, higher node density, and low latency needed for efficient microserver implementations. Network links from multiple nodes can be consolidated to this top-of-rack switch to reduce overall cost and power consumption. With 1 GbE, 2.5 GbE, 10 GbE, and 40 GbE interfaces, this switch supports flexible bandwidth allocation in dense, network-intensive computing environments.

2nd generation 64-bit Intel® Atom™ Processor C2000 Product Family for microservers

- Up to 7x higher[7] performance, up to 6x better[8] performance/watt

- 6-20 watt TDP[9]

- Up to 1000+ server nodes per rack[10]

- Full server class features: 64-bit, Error Correcting Code (ECC) Memory, Intel® Virtualization Technology

Great for lightweight, web scale workloads, such as static web serving and dedicated hosting

Take Advantage of Existing Hardware and Software Investments

- Full x86-compatibility for simple integration and workload portability

Every day, cloud providers and hosters are finding new ways to optimize their infrastructure in order to deliver more and better services at lower total cost. Intel is focused on delivering workload-optimized platform solutions that can help you optimize your infrastructure using a flexible, software-compatible server platform based on Intel Xeon and Intel Atom processors.

Intel® Atom™ Processor C2000 Product Family Overview

Features	Benefits
More Compute, Memory and I/O Resources	Delivers up to 7x higher performance than the prior generation Intel® Atom™ processor S1200 product family, with up to 8 cores, 64 GB of memory, and 16 PCIe* lanes per processor.
Intel's Industry-Leading 22 nm Silicon Technology	Provides tighter integration while improving energy efficiency by up to 6x, as compared to Intel Atom processor S1200 product family.
Ultra-Low Thermal Design Power (TDP)	TDPs as low as 6 watts enable significant energy cost savings and higher rack densities to deliver more performance with lower operating costs.
Feature-Rich SoC	Built-in GbE, SATA, and USB ports simplify the design of workload-optimized microservers and help to improve performance, density and energy efficiency.
Server Class Features	64-bit,[4] Error Correcting Code (ECC)[6] memory, and Intel® Virtualization Technology (Intel® VT)[5] provide the flexibility and reliability needed for data center workloads.
Complete Platform Solutions	From integrated management functionality to the Intel® FM5224 Microserver Switch, Intel supports complete platform solutions to deliver higher total value.

SKU List

Processor	Power	Frequency (Boost[10])	Cores	Memory Channels	DIMMs per Channel	Memory Type	Memory Speed	Max. Memory Capacity	Max. PCIe Lanes	PCIe* Controllers	Ports	Intel® Virtualization Technology
Intel® Atom™ Processor C2750	20W	2.4 GHz (2.6 GHz)	8	2	2	ECC DDR3/L	1600 MHz	64 GB	16	4 PCIe* 2.0	4 x 2.5 GbE 2 x SATA 3 4 x SATA 2 4 x USB 2	▪
Intel® Atom™ Processor C2730	12W	1.7 GHz (2.0 GHz)	8	2	2	ECC DDR3/L	1600 MHz	32 GB	8	2 PCIe 2.0	2 x 2.5 GbE 2 x SATA 3 4 x USB 2	▪
Intel® Atom™ Processor C2550	14W	2.4 GHz (2.6 GHz)	4	2	2	ECC DDR3/L	1600 MHz	64 GB	16	4 PCIe 2.0	4 x 2.5 GbE 2 x SATA 3 4 x SATA 2 4 x USB 2	▪
Intel® Atom™ Processor C2530	9W	1.7 GHz (2.0 GHz)	4	2	2	ECC DDR3/L	1333 MHz	32 GB	8	2 PCIe 2.0	2 x 2.5 GbE 2 x SATA 3 4 x USB 2	▪
Intel® Atom™ Processor C2350	6W	1.7 GHz (2.0 GHz)	2	1	2	ECC DDR3/L	1333 MHz	16 GB	4	1 PCIe 2.0	4 x 2.5 GbE 2 x SATA 3 4 x USB 2	▪

For more information on the Intel® Atom™ processor C2000 product family, visit **intel.com/microservers**