

Revolutionary X86
Performance and
Scalability

HIGHLIGHTS

Scales to 2,048 cores in
single system image

Up to 16TB global
shared memory

High performance
density with up to 4.65
tflops per rack

Open platform based
on Intel® Xeon®
processors (codename
Nehalem-EX)

Comprehensive HPC
software stack

High speed NUMALink®
5 interconnect and MPI
Offload Engine (MOE)
minimize latency and
maximize bandwidth

SGI® Altix® UV

Introducing the World's Fastest Supercomputer

Altix® UV scales to extraordinary levels—up to 2,048 cores (256 sockets) with architectural support to 262,144 cores (32,768 sockets). One of its most attractive features is its support for up to 16TB of global shared memory in a single system image. This enables Altix UV to remain highly efficient at scale for applications ranging from in-memory databases to a diverse set of data and compute-intensive HPC applications. Supporting these powerful capabilities are SGI's fifth-generation NUMALink® interconnect and integrated MPI Offload Engine (MOE) technology which allow Altix UV to lead the industry in maximizing bandwidth and minimizing latency for superior performance on cluster applications. The versatility and high performance of Altix UV allows it to solve the world's toughest computational challenges, whether deployed as an "analysis supernode" in conjunction with a large, scale-out Altix® ICE cluster or used as an independent, standalone system.

Scalable System Size

The Altix UV hardware platform is comprised of modular blades for "plug and solve" configuration flexibility. The innovative NUMAflex® architecture enables users to optimally size their systems, achieving the correct balance of compute, memory and storage capability. Altix UV is available in two form factors— Altix UV 1000 delivers a cabinet-level solution with maximum density and scalability, whereas Altix UV 100 leverages an industry-standard 3U rackmount form factor to address midrange needs of up to 768 cores. With configurations starting with as few as four sockets (16 cores), Altix UV is well positioned to scale up as performance requirements grow, preserving the initial investment along the way. The compact blade packaging of Altix UV also provides excellent performance density, delivering up to 4.65 teraflops per rack.



A Truly Open Platform

One of the ground-breaking aspects of Altix UV is that the hardware platform derives from open standards. The system's x86 architecture leverages quad-, six-, or eight-core Intel® Xeon® processors (codename "Nehalem-EX"). This allows for the use of completely unmodified Novell® SUSE® or Red Hat® Linux® operating systems for a start. But the impact grows from there as the x86 application ecosystem is unrivaled by any other. This makes Altix UV ideal—not only for running custom codes, but also off-the-shelf ISV applications. SGI speeds time to results by providing a complete HPC solution software stack, featuring SGI® ProPack™, ensuring that customers maximize the performance capability of the Altix UV platform.

Flexible System Expansion and Storage Capabilities

Industry-standard PCI Express expansion slots open up countless possibilities for system configurations with seamless support for industry-standard networking, storage and graphics/GPU cards. This enables deployment of NVIDIA® Tesla™ GPUs to supercharge performance for many workloads. It also means full support for the entire SGI InfiniteStorage line of EBOD, RAID, SAN, NAS and Tape storage solutions—along with SGI's rich set of InfiniteStorage software, including its clustered file system CXFS® and Data Migration Facility (DMF). Taking all of these advantages into account, it is clear why Altix UV is such a versatile solution for shared or distributed memory applications of any scale.



SGI® Altix® UV

System Specifications

www.sgi.com/servers

Model	Altix UV 100	Altix UV 1000
Enclosure Type	3U Rackmount Blade Enclosure	18U Rackmount Blade Enclosure
Processor Architecture	Intel Xeon "Nehalem-EX"	Intel Xeon "Nehalem-EX"
Chipset	Intel "Boxboro"	Intel "Boxboro"
Max. Processors (Cores)	96 (768 cores)	256 (2048 cores)
Max. Flops	7.0 tflops	18.6 tflops
Max. Memory	6TB	16TB
Interconnect	NUMALink® 5	NUMALink® 5
Interconnect Speed (Bidirectional)	120Gb/sec (15GB/sec)	120Gb/sec (15GB/sec)
Interconnect Latency	<1µs	<1µs
Interconnect Topology	2D torus	Paired Node 2D torus
Max. Hard Disk Drives & Max. Capacity	Sixteen 2.5" (max. 8TB) SAS hot-swap drives	Sixteen 2.5" (max. 8TB) SAS hot-swap drives
External Storage Options	SGI InfiniteStorage RAID, EBOD, NAS, SAN and tape libraries	SGI InfiniteStorage RAID, EBOD, NAS, SAN and tape libraries
Standard Rack Options	20U or 40U rack	42U cabinet

Enclosure Specifications

Max. Blades/Enclosure	2	16
Max. Enclosures/System	24 in 2 racks	8 in 4 cabinets
Max. Hard Disk Drives & Max. Capacity	Two 2.5" (max. 600GB) SAS hot-swap drives	Sixteen 2.5" (max. 8TB) SAS hot-swap drives
Airflow	Front-to-back, ideal for hot-aisle/cold-aisle environments	Front-to-back, ideal for hot-aisle/cold-aisle environments
Cooling Architecture	N+1 redundant cooling fans. SGI water chilled door option.	N+1 redundant cooling fans. SGI water chilled door option.
Power Architecture	N+1 redundant, hot swappable power supplies and fans	Redundant, hot swappable power supplies (N+1 for blades, 1+1 for fan modules)
Input Power	Three 110-264VAC (50-60Hz) C13 outlets	200-240VAC (50-60Hz) 3-phase 60A IEC 60309 plug (two/rack)
Power Supplies/Enclosure	Three 950W	Eight 2837W
Environmental (Non-Operating)	Temperature: -40C to +60C (-40F to +140F), Humidity: 8% to 95%, non-condensing.	Temperature: -40C to +60C (-40F to +140F), Humidity: 8% to 95%, non-condensing.
Environmental (Operating)	Temperature: +5C to +35C (+41F to +95F), derating applies at altitude. Humidity: 5% to 90%, non-condensing, maximum gradient 10% per hour.	Temperature: +5C to +35C (+41F to +95F), derating applies at altitude. Humidity: 5% to 90%, non-condensing, maximum gradient 10% per hour.
Max. Weight	52 lbs. (23.6 kg)	61.0 lbs. (276.7 kg)
Dimensions (HxWxD)	5.25" (3U) x 19" x 24"	31.5" (18U) x 24" x 29"

Blade Specifications

Max. Processors	Two Intel® four-, six- or eight-core Xeon® processors (codename "Nehalem-EX")
Max. Cores	16
Max. Memory	128GB
Memory Slots	16
Memory Type	DDR3 ECC reg.
I/O Mezzanine Card Options	Base I/O (network, USB, disk controller) or System Expansion (one PCI-E 2.0 x16 and one PCI-E 2.0 x8 slot)

Software Support

Red Hat® Enterprise Linux®	Planned: contact SGI for availability
Novell® SUSE® Linux Enterprise Server	11
SGI Linux System Software Suite	SGI Foundation Software, SGI ProPack™ 7
SGI InfiniteStorage Total Control Suite	CXFS®, XFS®, Data Migration Facility (DMF), LiveSAN™ client, XVM® and backup and restore solutions

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