SGI® Altix® 3700 Bx2
At-A-Glance

The Announcement

Twice the Bandwidth, Half the Footprint of the Original Award-winning Altix® 3000

On Thursday, October 28, 2004, SGI unveiled the newest member of the Altix family of Servers, Clusters and Supercomputers. Altix 3700 Bx2, which leverages the new 1.6 GHz Itanium® 2 processors with 9MB cache, and enables customers to pack 64 processors into a standard Altix rack. Incorporating fewer components within its innovative, more cost-effective form factor, the new Altix 3700 achieves a price/performance improvement of up to 50 percent over the earlier model, and is ideal for high-performance computing environments where both performance and space availability are at a premium. Working with rapidly growing data sets and problem complexity, HPC users in manufacturing, life sciences, and homeland security environments must commit more facility space to large storage arrays and other assets, prompting them to seek out higher-density servers and supercomputers.

Scaling to 256 Itanium 2 processors in a single node, Altix 3700 leverages the powerful SGI® NUMAflex™ global shared-memory architecture to derive maximum application performance from new high-density CPU bricks. The new configuration also doubles available bandwidth between Altix bricks with SGI's NUMAlink4 interconnect technology—the industry's fastest at 6.4GB/sec. Each node in an Altix 3700 system can contain 16 to 256 processors, 4 gigabytes to 8 terabytes of global shared memory, and 48 XIO buses; and delivers over 3 gigabytes per second of sustained I/O bandwidth.

The Altix 3700 Bx2 is:

The power behind breakthroughs in science and engineering

- Run barrier-breaking applications with up to 24TB of addressable memory
- Scale applications for real sustained performance
- Accelerate applications with extraordinary 'Peer I/O' capability

The most flexible platform for large-scale HPC workloads

- Scale up or scale out on one platform
- Run small to large jobs in any programming model
- Bring compute, I/O, memory resources to your problem in the proportion needed

The only supercomputing solution fully devoted to Industry standards, including Linux® and Linux only

- Access hundreds of 64 bit technical applications with Industry standard Linux
- Stay on top of the industry with the latest Intel Itanium 2 processors
- Benefit from SGI's support of the Linux community with technology and expertise to assure that Linux HPC delivers the performance and features that users demand without compromising compatibility

Features and Benefits

Altix 3700 Bx2 extends SGI's industry leadership in standards-based HPC—delivering top sustained performance in addition to ease of use, investment protection and total flexibility in application deployment.

Feature	Benefit
Up to 256 processors tightly coupled and operating under a single copy of the O/S	The SGI NUMAflex computing design provides global shared memory with high bandwidth and very low latency access for up to 256 processors. All resources in the system are managed through a single instance of the operating system—the industry's largest single system image. Altix 3700 Bx2 features NUMAlink4, SGI's latest high performance router. These features deliver: • **Fastest time-to-solution for capability applications and best job throughput for mixed capacity workloads.** • **Flexibility for the widest range of HPC workloads** • **Ease of use for apps development, optimization and administration**
Truly modular design and implementation	The SGI Altix 3700 Bx2 system provides performance and real scalability with its NUMAflex modular computing design. There is no central bus or switch—only modules and NUMAlink cables. System resources such as CPU, memory or I/O can be scaled independently. Benefits are: **Buy and independently scale the resources needed - a system balanced for your apps and use.** **Investment protection -** takes on new meaning with the ability to independently upgrade, expand or swap system resources to keep up with changing user demands, organizational structures and technology improvements.
Extreme capability in memory and I/O	**New performance frontiers with very large memory -** up to 24TB of globally addressable memory. **Breakthrough performance enhancement with Peer I/O -** Altix 3700 Bx2 introduces the capability of Peer I/O, which is the industry's first direct-attach I/O technology.
Complete HPC solution on Linux	**Performance acceleration -** SGI's complete development and administration environment, including Intel compilers, SGI libraries and third party development, analysis and optimization tools, provides the environment necessary for great performance. **The most scalable, fastest and most complete data management infrastructure on Linux -** from the clustered CXFS™ Filesystem to NAS and SAN servers, hierarchical storage management software and record-breaking backup, Altix 3700 Bx2 has the most complete data solution on 64 bit Linux today.
System and component redundancy and diagnostics for RAS	**Inherent reliability -** on top of the inherent reliability features that are built into the Itanium 2 processors, SGI builds reliability into each of the modules in the Altix 3700 Bx2 system. Power supplies and cooling fans are N+1 redundant and can be replaced without system downtime in the event of failure. The SGI Altix 3700 Bx2 system also uses the same diagnostic controller subsystem as the SGI® Origin® 3000 system has used for many years. This subsystem reports intermittent errors and recommends preemptive remedial action to on-site or remote SGI service personnel.

Key Specifications

Configurations

- Processors: 16 to 2048 total; 8 to 256 per node
- Memory: 16GB to 24TB
- XIO™ I/O Channels: 2 to 512

NUMAflex 8-Port Router Interconnect module (R-Brick)
Router brick: Enables large shared-memory configurations above 64 processors, up to thousands of processors.

Note: Integrated router in compute module (CR-Brick) enables shared-memory configurations from 8 to 64 processors.

Compute Module with 8P and up to 96GB Memory (CR-Brick)

- Processor options:
  - 1.3 GHz Intel Itanium 2 with 3MB on-chip cache
  - 1.6 GHz Intel Itanium 2 with 6MB on-chip cache
  - 1.5 GHz Intel Itanium 2 with 4MB on-chip cache
  - 1.6 GHz Intel Itanium 2 with 6MB on-chip cache
  - 1.6 GHz Intel Itanium 2 with 9MB on-chip cache
- Memory: up to 96GB DDR ECC
  Memory options:
  - PC2700 166 MHz, 1GB DIMMs
  - PC 2100 133 MHz, 2GB DIMMs

  Memory kits: 4GB, 8GB and 16GB
- Memory controller:
  5-port crossbar per node board

Memory Expansion Module with up to 96GB Memory (M-Brick)

- Memory: up to 96GB DDR ECC
  Memory kits: 4GB, 8GB and 16GB
- Memory controller:
  5-port crossbar per node board

Base System I/O Module with PCI-X (IX-Brick)

- Ports:
  1-port SCSI, 1-port Gigabit Ethernet, 1-port RTI, 1-port RTO, 2 serial ports
- Internal devices:
  1 system disk standard, optional redundant system disk, DVD-ROM
- Disk interface:
  Ultra160 SCSI
- I/O Interface: 5 64-bit/133 MHz PCI-X buses with 10 available slots, 1 64-bit/66 MHz PCI slot

PCI-X Expansion Module (PX-Brick; PA-Brick)

- PX-Brick:
  Interface:
  64-bit/133 MHz PCI-X buses, 3.3V and Universal 64-bit/66 MHz PCI-compatible
  Number of buses: 6
  Number of slots: 12 (2/bus) full length; max. 1/bus for 133 MHz PCI-X cards
- PA-Brick: Peer I/O Capability
  Interface:
  64-bit/133 MHz PCI-X buses, 3.3V and Universal 64-bit/66 MHz PCI-compatible
  Number of buses: 4
  Number of slots: 6 (2/bus) full length; max. 1/bus for 133 MHz PCI-X cards