SGI® Altix™ 3000 Family of Servers and Superclusters
64-Bit Linux® Systems for Technical Applications

Features
- Breakthrough performance in a standards-based environment
- Global shared memory across large, 64-processor cluster nodes
- Built-in cluster interconnect fabric up to 200 times faster than conventional switches
- High-productivity computing optimization with industry-standard Linux

Breakthrough Performance in a Standards-Based Environment
For technical users seeking to achieve breakthrough performance with open-source computing, the SGI Altix 3000 family brings a revolutionary capability to Linux OS-based clusters—global shared memory. SGI Altix 3000 superclusters provide stunning increases in performance and capability over traditional Linux clusters, scaling to hundreds—and eventually thousands—of Intel® Itanium® 2 processors in a 64-bit environment that is specifically optimized for technical applications.

Global Shared Memory across Large, 64-Processor Cluster Nodes
SGI Altix 3000 superclusters dramatically reduce the time and resources required to run technical applications by managing extremely large data sets in a single, system-wide, shared-memory space. Global shared memory allows applications to access both in-node and out-of-node memory. By holding more complex geometries or complete workflows in memory, SGI Altix 3000 also enables new application breakthroughs that traditional Linux clusters can’t tackle. The third-generation SGI® NUMAflex™ architecture spans terabytes of global shared memory across large nodes that are uniquely scalable and configurable. Each node can scale from four to 64 Itanium 2 processors per Linux operating system image, reducing software and administration costs. With global shared memory across powerful nodes, SGI Altix 3000 delivers breakthrough performance in an easy-to-manage, standards-based environment.

Built-In Interconnect Fabric up to 200 Times Faster than Conventional Switches
The high-bandwidth SGI® NUMAlink™ interconnect fabric of the SGI Altix 3000 family delivers both memory and networking information among cluster nodes up to 200 times faster than standard cluster switches. Data crosses over an SGI NUMAlink switch, round-trip, in as little as 50 nanoseconds—faster than most supercomputers’ local memory access time—enabling balanced, sustained application performance on technical workloads.

High-Productivity Computing Optimization with Industry-Standard Linux
SGI Altix 3000 superclusters use an industry-standard, 64-bit Linux environment that is fully optimized for superior data handling, system administration, and resource management. SGI Altix 3000 works with the distributed, high-performance CXFS™ filesystem, providing data access across a heterogeneous network at local filesystem speeds. Advanced hierarchical storage management solutions and the XVM enhanced volume manager support exabyte-scale data sets and eliminate I/O bottlenecks. And unique tools like Performance Co-Pilot™, CPU sets, and Message Passing Toolkit enable streamlined performance over large systems. Only SGI provides these levels of high-productivity optimization in a fully supported, standard Linux environment.
SGI Altix™ 3700 Superclusters Technical Specifications

Scalable to hundreds of processors, with up to 64-processors per node, SGI Altix 3700 superclusters are housed in tall [40U] standard 19" racks that have integral power supplies and are cooled by ambient computer room air. The interconnect topology used in the SGI Altix 3700 supercluster is a dual-plane, fat-tree topology, which uses SGI® NUMAlink™ 3 routers running at 3.2GB/sec bidirectional on each link for a total aggregate bandwidth of 6.4 GB/sec.

SGI Altix 3000 Series Specifications

NUMAflex B-Port Router Interconnect Module [R-Brick] (Model 3700 only)

- Router
  - Enables shared-memory configurations from 8 to 64 processors
- Metarouter
  - Enables large shared-memory configurations above 64 processors, up to 512 processors

Compute Module, 4P and up to 32GB Memory [C-Brick]

- Processors
  - Model 3700: 4 1.5 GHz or 4 1.3 GHz
- Processor caches
  - 1.3 GHz CPU: On-die L3 cache, 3MB per processor
  - 1.5 GHz CPU (Model 3700 only): On-die L3 cache, 6MB per processor
- Memory
  - Up to 32GB DDR ECC
- Memory options:
  - PC2100 133 MHz, 1GB DIMMs
  - PC2700 166 MHz, 512MB DIMMs
- Memory controller
  - 5-port crossbar per node board
- Memory bandwidth
  - Max. 20.48GB/sec per C-Brick

Memory Expansion Module, up to 32GB Memory [M-Brick] (Model 3700 only)

- Memory kits
  - 4GB and 8GB
- Memory controller
  - 5-port crossbar per node board
- Memory bandwidth
  - Max. 20.48GB/sec per M-Brick

Base System I/O Module with PCI-I [IX-Brick]

- Ports
  - 1-port PCI, 1-port RTQ, 1-port RTQ, 2 serial ports
- Internal devices
  - 1 system disk standard, optional redundant system disk, DVD-ROM
- Disk interface
  - Ultra320 SCSI
- I/O interface
  - 64-bit/133MHz PCI-X buses with 10 available slots
- Total I/O bandwidth
  - 2.4GB/sec peak per brick (dual ported IX-brick at 4.8GB/sec peak)

PCI-X Expansion Module [PX-Brick] (Model 3700 only)

- Interface
  - 64-bit/133MHz PCI-X buses, 3.3 V and Universal 64-bit/66MHz PCI-X compatible
- Number of buses
  - 6
- Number of slots
  - 12 [2/4/8] full length, max. 1/8 for 133 MHz PCI-X cards
- Total I/O bandwidth
  - 2.4GB/sec peak per brick (dual ported PX-brick at 4.8GB/sec peak)

JBD Disk Expansion Module [D-Brick2] (Model 3700 only)

- Interface
  - Ultra320 SCSI, 160MB/sec peak bandwidth
- Drive bays
  - 42Gb Fibre Channel
- RAID
  - Ultra320 SCSI, 2Gb Fibre Channel
- Data servers
  - Gigabit Ethernet server, 800Gbps (Gigabit Ethernet)
- Tape and libraries
  - 2Gb Fibre Channel

Dimensions and Weights

- Tall rack: 75" H, 53" D, 30" W, 4U internal usable space, 1,175 lb max.
- Short rack: 75" H, 53" D, 30" W, 4U internal usable space, 1.225 lb max.
- RAID/JBD rack: 75" H, 53" D, 24" W, 38U internal usable space, 1,245 lb max.

Environmental (Operating)

- Temperature
  - +5°C to +35°C, altitude 5,000 MSL
- Humidity
  - 10% to 90% noncondensing

Environmental (Nonoperating)

- Temperature
  - -40°C to +60°C
- Humidity
  - 10% to 95% noncondensing
- Altitude
  - 40,000 MSL

Electrical and Power

- Voltage
  - 180–254 VAC single phase

Software

- System software
  - SGI Advanced Linux® Environment with SGI ProPack™
  - Networking
  - TCP/IP, NFS V2/V3, DHP, SNMP management, SNMP MIB, NIS/ONC+
- Available server software
  - XFS 64-bit journabled filesystem, XFS® shared filesystem, Performance Co-Pilot system and network monitoring, SGI® Linux Failsafe®, DMF, TMF
- Compilers
  - Intel® Itanium II Processor Family compilers: C/C+++, Fortran GNU compilers: C, Fortran 77
- Tools
  - Libraries: MPI, Array Services, PCL, FFT, and Intel® Math Kernel Library
  - Debuggers: Elmus® TotalView®, Intel® gdb
  - Performance analysis: Intel® Vtune™, Pallas Vampir™ and Vampirtrace™, SGI® Hixt
  - Samba® environments for PC
  - Partitioning
  - Support for system partitioning up to 512P based on maximum 64-processor Linux partitions

Support and Services

- SGI also offers appropriate services to implement and integrate Linux applications in your environment. For more information on available services, please see www.sgi.com/support/