Datasheet

SGI® Origin® 3000 Series

SGI® Origin® 3200 and SGI® Origin® 3800 Servers

Features

- True multidimensional scalability
- Snap-together flexibility, serviceability, and resiliency
- Clustering to tens of thousands of processors
- SGI Origin 3200—scales from two to eight MIPS processors
- SGI Origin 3800—scales from 4 to 512 MIPS processors

As Flexible as Your Imagination

Building on the robust SGI®NUMA architecture that made award-winning SGI Origin family servers the most modular and scalable in the industry, the SGI Origin 3000 series delivers flexibility, resiliency, and performance at breakthrough levels. Now taking modularity a step further, you can scale CPU, storage, and I/O components independently within each system. Complete multidimensional flexibility allows organizations to deploy, upgrade, service, expand, and redeploy system components in every possible dimension to meet any business demand. The only limitation is your imagination.

Build It Your Way

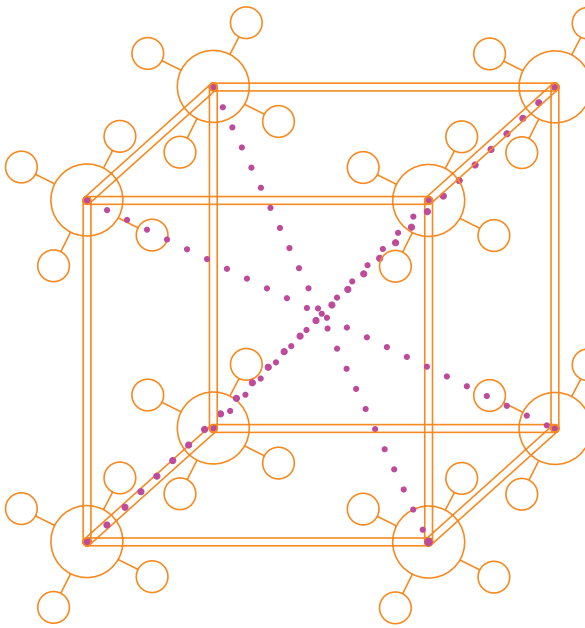
SGI® NUMAflex™ is a revolutionary snap-together server system concept that allows you to configure—and reconfigure—systems brick by brick to meet the exact demands of your business applications. Upgrade CPUs to keep apace of innovation. Isolate and service I/O interfaces on the fly. Pay only for the computation, data processing, or communications power you need, and expand and redeploy systems with ease as new technologies emerge.

Performance, Reliability, and Versatility

With their high bandwidth, superior scalability, and efficient resource distribution, the new generation of Origin servers—SGI Origin 3200, and SGI Origin 3800—are performance leaders. The series provides peak bandwidth for high-speed peripheral connectivity and support for the latest networking protocols. The most advanced storage technologies are supported—up to 100MB-per-second Fibre Channel and the SGI® clustered filesystem (CXFS™) for storage area networks (SANs). To provide the reliability today's applications demand, the series delivers uninterrupted availability through ECC memory, redundant power and cooling, and hot-pluggable disks and PCI, along with IRIS FailSafe™ software. And for integrated graphics, SGI Origin 3000 series servers support a full spectrum of high-performance visualization capabilities. Simply add a graphics expansion module to take advantage of InfiniteReality3™ graphics.

Investment Protection

Built on the reliable SGI NUMA architecture and IRIX® 6.5 operating system, SGI Origin 3000 series servers work with your existing application software and are fully compatible with other SGI IRIX OS-based workstations and servers. The applications you use every day transition effortlessly and perform better than ever. With the same familiar tools and operating system, you can integrate the series with no retraining. SGI Origin 3000 series servers protect your investments thoroughly and ensure the availability of a wide range of open systems software into the future.



The SGI Origin 3000 series gives you the flexibility to build a system that truly matches tomorrow's growth plans and today's business requirements—whether you need advanced computation for weather simulation, massive storage for archiving bioinformatic data, or high-performance I/O for media streaming. To scale system performance to meet your needs, choose the bricks your applications require.

Build and Maintain Your Ideal System—One Brick at a Time

SGI Origin 3200

This affordable, routerless system scales from two to eight processors in a single shared-memory image and can be clustered to leverage the power of hundreds of CPUs using a variety of low-latency, high-bandwidth interconnects. A single point of administration is achieved to manage the cluster through the SGIconsole™ management system.

SGI Origin 3800

With the largest single-kernel, shared-memory image available, SGI Origin 3800 easily scales with snap-together modularity to 512 processors and a terabyte of memory. Built-in metarouters allow clustering to tens of thousands of CPUs, making supercomputing more accessible than ever. Customers interested in very large memories to solve the largest problems will find SGI Origin 3800 the most powerful and flexible shared-memory system platform. If workloads require a mixture of shared-memory and message-passing development environments, SGI Origin 3800 is flexible enough to be configured with software as a single 512-processor shared-memory server or be divided into several partitions, each running a separate OS without having to recable or reconfigure the hardware. A partitioned system benefits from the low-latency and high-bandwidth NUMAlink™ interconnect between system partitions while also providing the advantages of higher availability that a cluster delivers.

R-brick

Router Interconnect

As the structural building block of the system, the R-brick replaces the system bus; it's a high-speed crossbar connecting processors and memory and enabling each system component to be serviced or upgraded individually. Add infrastructure as you need it—from routerless deskside systems to an eight-port router multirack configuration that delivers 512 processors in a single shared-memory environment.

C-brick

CPU Module

The basic C-brick module contains four MIPS® CPUs and local memory. A single crossbar memory controller delivers 200% greater CPU-to-memory bandwidth than previous generations. Now with four CPUs in a C-brick, the system offers a twofold increase in CPU density, improving memory latency by up to 50% and minimizing the use of valuable floor space.

I-brick

Base I/O Module

The I-brick, standard in all systems, provides base I/O in a module and includes the system disk, CD-ROM, Ethernet, and four available PCI slots. As the system grows, customers have the option to partition the system for greater availability, using additional I-bricks as base I/O for each partition.

P-brick

PCI Expansion

For PCI expansion, a P-brick provides 12 hot-swappable PCI slots distributed over six 64-bit/66 MHz PCI buses. Total peak I/O bandwidth exceeds 3GB per second.

X-brick

XIO™ Expansion

For high-performance I/O expansion, X-bricks deliver four XIO slots that support HIPPI, GSN, VME, and digital video.

G-brick

Graphics Expansion

Tightly integrated InfiniteReality3 graphics add large-scale visualization capabilities for accelerated insight into complex data sets.

D-brick

Disk Storage

D-bricks provide modular JBOD mass storage for data-intensive applications. D-bricks support up to 12 drives, have dual-power supplies standard, and support drive capacities of 36GB, 73GB and and 180GB.

NUMAflex

NUMAflex—Only from SGI

The SGI Origin 3000 series is the first generation of servers to deliver the benefits of NUMAflex, a system concept offered only by SGI. Based upon the award-winning SGI NUMA architecture, NUMAflex is a breakthrough design philosophy that rests on three solid pillars:

- Flexibility
- Resiliency
- Future-proof infrastructure

The SGI Origin 3000 series was developed in order to offer server solutions that provide these NUMAflex advantages:

- Breakthrough performance and results
- Lower cost of ownership
- Easier management and administration
- The best investment protection in the industry

SGI Origin 3000 Series
Technical Specifications

	SGI Origin 3200	SGI Origin 3800
Processors	2–8	4–512
System bandwidth	11.2GB/sec	716GB/sec max.
Maximum memory	16GB	1TB
Router type	None	8-port, Metarouter
Base I/O	One 1-brick	One 1-brick
System disk	36GB	36GB
Operating system	IRIX 6.5	IRIX 6.5

R-brick

- 8-port — Supports shared-memory system configurations up to 128 CPUs
- Metarouter — Supports shared-memory system configurations up to 512 CPUs

C-brick

- Processors — 4 R14000™or R14000A™ CPUs
- Memory — Up to 8GB ECC SDRAM in 4 banks
- Memory kits — 1GB, 2GB
- Memory controller — 5-port crossbar
- Memory bandwidth — 3.2GB/sec total memory bandwidth Interleaving 4-way per C-brick

I-brick

- Ports — 2-ports USB, 100Base-T, 1-port IEEE 1394, 1-port serial, 1-port Fibre Channel
- Internal devices — 1 system disk standard, CD-ROM drive
- Disk interface — Fibre Channel
- I/O interface — One 64-bit/66 MHz PCI bus, 2 slots; one 64-bit/33 MHz PCI bus, 3 slots
- Device capacity — 36GB (15K rpm)

P-brick

- Interface — 64-bit/66 MHz PCI, 3.3 V, and Universal
- Number of buses — 6
- Number of slots — 12 (2/bus) full-length
- Total I/O bandwidth — 3.1GB/sec peak total

X-brick

- Interface — XIO
- Number of slots — 4
- Total I/O bandwidth — 1.6GB/sec peak

D-brick

- Interface — 66 MHz/1GB Fibre Channel, SAN aware
- Drive bays — 12 hot-plug, 3.5" power 110/220 V, redundant power supplies standard
- Maximum bandwidth — 200MB/sec
- Device capacity — 36GB (10K rpm) , 73GB (15K rpm), 180GB (72K rpm) JBOD

G-brick

- InfiniteReality3 graphics
- 1–2 graphics pipelines per G-brick
- First pipe: 1 or 2 Raster Managers
- Second pipe: 1, 2, or 4 Raster Managers
- 2–8 display channels per graphics pipeline

Processor Data

- Microprocessor — MIPS RISC R14000 at 500 MHz, R14000A at 600 MHz
- Primary cache — 2-way set-associative 32KB instruction/32KB data cache
- Secondary cache — 8MB, DDR full-speed SDRAM

Power Bay

- Power requirements — 220–240 VAC external source
- Power distribution — 48 VDC internally distributed to all bricks

PCI Adapters

- 1-port Fibre Channel optical
- 1-port Fibre Channel copper
- 1-port ATM0C3
- 1-port ATM0C12
- 1-port Gigabit Ethernet optical
- 1-port Gigabit Ethernet copper
- 2-port Ultra SCSI differential
- 8-port digital audio
- PCI serial card
- Universal Myrinet-2000

XIO Adapters

- 1-port FDDI dual attach
- 1-port HIPPI 800 serial
- Digital video
- Digital video with DVCPro
- High-definition video
- 1-port GSN (half bandwidth)
- 1-port GSN (full bandwidth)
- VME 6U
- VME 9U
- 4-port ATM0C3
- 4-port Fast-Ethernet (100 Base-Tx)
- DMediaPro DM3-HD and SD video I/O

Mass Storage

- HBA interfaces — Fibre Channel, Ultra 160 SCSI
- RAID controller — 2 controllers per SGI® TP9100
2 to 4 controllers per SGI® TP9400
- Host interfaces — 100MB/sec or 200MB/sec for SGI TP9100
200MB/secsec for SGI TP9400
1 or 2 160MB/sec for SGI® TP900
- Maximum capacity per rack — SGI TP9100 1Gb 19.5TB*
SGI TP9100 2Gb 14TB*
SGI TP9400 20TB
SGI TP900 1GB 584GB
- Drive capacity — 18GB**, 36GB***, 73GB, and 181GB****

** Raw JBOD capacity*
*** Not available for TP9400*
**** Not available for TP900*
***** Not available for 2Gb TP9100 or TP900*

Dimensions and Weights

- SGI Origin 3200 — 34" H x 40" D x 24" W; 17U internal usable space; 250 lb max.
- SGI Origin 3800 — 74" H x 50" D x 30" W; 39U internal usable space; 970 lb max.
- I/O rack — 74" H x 50" D x 30" W; 39U internal usable space; 1,050 lb max.
- RAID/JBOD rack — 71" H x 32" D x 24" W; 38U internal usable space; 1,265 lb max.

Device Capacity

- 18GB, 36GB, 73GB, RAID

Environmental (Operating)

- Temperature — +5 to +35°C, altitude 5,000 MSL
+5 to +30°C, altitude 10,000 MSL
- Humidity — 10% to 90% noncondensing

Environmental (Nonoperating)

- Temperature — -20 to +60°C
- Humidity — 10% to 95% noncondensing
- Altitude — 40,000 MSL

Electrical and Power

- Voltage
  - -Origin 3200: — 180–254 VAC, single phase
  - -Origin 3800: — 180–254 VAC, 3 phase (North America/Japan)
360–424 VAC, 3 phase (International)
- Heat/power — 4,500 W maximum per power bay, N+1 (6 x 750 W supplies), 15,100 BTU/hr
- Electrical service/type
  - -Origin 3200: — NEMA 6-15R (North America/Japan)
Country specific (International)
  - -Origin 3800: — NEMA L6-30R 30 amp (North America/Japan)
IEC60309 32 amp (International)

Software

- System software — IRIX 6.5 Advanced Server Environment, X/OPEN XPG4 BASE 95, IEEE POSIX 1003.2, and 1003.1b, 1003.1c FIPS 151-2, UNIX System 4.4, 4.3 BSD extensions, MIPS ABI, SVID issue 3, X11 R6, Motif Window Manager 1.2, IRIS GL™, OpenGL®
- Networking — TCP/IP, NFS V2/V3, RSVP, DHCP, Bulk Data Service (BDSpro), NetVisualyzer™, SNMP management, SNMP MIB, NIS/ONC+, OS bypass with Schedule Transfer (ST) protocol
- Server software — XFS™ 64-bit journaled filesystem with guaranteed rate I/O, Clustered XFS (CXFS), Networker, HPC Performance Co-Pilot™ system and network monitoring, System MIB (Provision), software distribution (Propel), Enlighten DSM
- Cluster software — MPI Toolkit, LSF, and IRIX Advanced Cluster Environment (ACE) provide centralized administration to support clustered or partitioned servers, job scheduling, accounting, load balancing of batch/interactive jobs, S/W distribution, and user, system, and network management
- Compilers — ANSI C, C++, Fortran 77 and 90, ADA, Pascal, Power C Accelerator (PCA), Power Fortran 77 and 90
- Interoperability — Samba environments for PC
- Security — Trusted IRIX™ B1 security, Commercial Security Pack (CSP)
- Partitioning — CLI interface mkpart in IRIX

Corporate Office
1600 Amphitheatre Pkwy.
Mountain View, CA 94043
(650) 960-1980
www.sgi.com

North America 1(800) 800-7441
Latin America 1(650) 933-4637
Europe (44) 118.925.75.00
Japan (81) 3.5488.1811
Asia Pacific (65) 771.0290

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