Datasheet

SGI™ Origin™ 3000 Series

SGI™ Origin™ 3200, SGI™ Origin™ 3400, 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 3400—scales from 4 to 32 MIPS processors
- SGI Origin 3800—scales from 16 to 512 MIPS processors

As Flexible as Your Imagination

Building on the robust 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

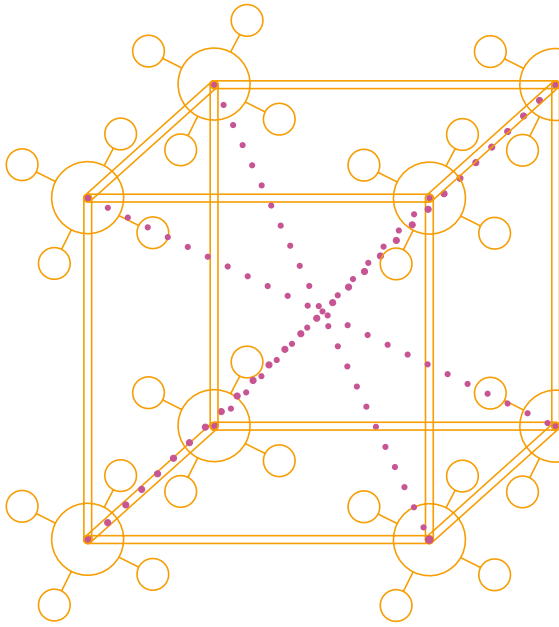
SGI™ NUMAflex™ is a revolutionary snap-together server system concept that allows you to configure—and reconfigure—systems brick by brick to meet the exact demands of your business applications. Upgrade CPUs to keep apace of innovation. Isolate and service I/O interfaces on the fly. Pay only for the 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, SGI™ Origin™ 3400, 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 SGI IRISconsole™ management system.

SGI Origin 3400

This server includes two six-port routers to accommodate scaling from 4 to 32 processors in a single shared-memory image. For maximum flexibility, the processor and I-bricks can be configured within the same rack, with the option of adding a second rack for additional I-bricks in application areas demanding higher levels of I/O.

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 two-fold 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 18GB, 36GB, and 73GB.

NUMAflex

Introducing NUMAflex™—only from SGI.

The new 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 four solid pillars:

- Flexibility
- Resiliency
- Investment protection
- Performance

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

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

SGI Origin 3000 Series
Technical Specifications

	SGI Origin 3200	SGI Origin 3400	SGI Origin 3800
Processors	2–8	4–32	16–512
System bandwidth	11.2GB/sec	44.8GB/sec max.	716GB/sec max.
Maximum memory	16GB	64GB	1TB
Router type	None	6-port	8-port, Metarouter
Base I/O	One I-brick	One I-brick	One I-brick
Additional system I/O	—	—	One P-brick
System disk	18GB	18GB	18GB
Operating system	IRIX 6.5	IRIX 6.5	IRIX 6.5

R-brick

• 6-port	Supports shared memory system configurations up to 32 CPUs
• 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 R12000™ or R14000™* CPUs
• Memory	Up to 8GB ECC SDRAM in 4 banks
• Memory kits	512MB, 1GB, 2GB*
• Memory controller	5-port crossbar
• Memory bandwidth	3.2GB/sec peak

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

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	2.4GB/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	18GB, 36GB, 73GB 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 R12000 at 400 MHz, R14000 at 500 MHz*
• Primary cache	R12000: 2-way set-associative 32KB instruction/32KB data cache R14000: 2-way set-associative 32KB instruction/32KB data cache
• Secondary cache	R12000: 8MB, SDRAM R14000: 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 ATMOC3
- 1-port ATMOC12
- 1-port Gigabit Ethernet optical
- 1-port Gigabit Ethernet copper
- 2-port serial
- 2-port Ultra SCSI differential
- 2-port Ultra2 SCSI (LVD)
- 8-port digital audio

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 ATMOC3*

Mass Storage

• HBA interfaces	Fibre Channel, Ultra SCSI, Ultra2 SCSI
• RAID controller	Fibre Channel, 128MB cache; 2 controllers per SGI™ TP9100 module
• Internal loops	Two standard per TP9100
• Maximum capacity	166TB JBOD, 656TB RAID
• RAID storage	TP9100 RAID rack; maximum of 9 TP9100 modules
• Device capacity	18GB, 36GB, 73GB RAID

Dimensions and Weights

• SGI Origin 3200	34" H x 40" D x 24" W; 17U internal usable space; 250 lb max.
• SGI Origin 3400/3800	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.

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	220–230 VAC, single-phase and 3-phase
• Heat/power	4,500 W available per power bay, N+1 (6 x 750 W supplies), 15,100 BTU/hr
• Electrical service/type	NEMA 6-30, 208 VAC @ 30 amp

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**

** Available Q1CY01, **Q4CY00*

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