Datasheet

Origin™ 2000

Scalable Server for Solutions Demanding High Performance and I/O Bandwidth

Meeting Growing Business Demands

As the acknowledged world leader in high-performance computing, SGI™ technology is employed wherever unleashing creativity and insight is a priority. The SGI™ Origin™ family of servers delivers a unique combination of performance, expandability, availability, and compatibility, making Origin™ 2000 an ideal center for your computing universe.

Origin 2000 servers are the market leaders in technical computing applications and command a growing presence in technical enterprise, with an emphasis on Internet, large corporate data, and communications applications. The robust SGI implementation of ccNUMA architecture allows for tremendous scalability, limited only by current software and application abilities. Origin 2000 allows you to purchase only the processing bandwidth you need up front and then expand your system seamlessly as business growth demands and budgets allow.

Evolve Your System—Modular and Flexible

Origin 2000 is scalable in all dimensions, powerful, and flexible. Enter the product line with a two- to eight-processor deskside system that can be seamlessly expanded to 512 processors in a shared-memory server. The key building block of the Origin 2000 system is a module that contains processors, I/O, memory, and power supplies. A single module supports two to eight MIPS® processors and up to 16GB of memory, providing more than 5GB per second of sustained I/O bandwidth. Expand your system by adding modules and linking them with the revolutionary CrayLink™ interconnect, a high-speed, scalable interconnect fabric that provides incremental bandwidth while maintaining the shared memory model of an SMP server.

Faster Time to Insight

With Origin 2000, you have the flexibility to balance your compute, memory, and I/O requirements. As you grow a system by adding modules, you increase processor and memory capacity, I/O bandwidth, and overall system bandwidth. This ensures that no matter how large the data, you will not be constrained by a saturated bus.

The modular design of Origin 2000 also makes it naturally resilient to failures. ECC memory, redundant power and cooling, hot-pluggable disks, and Fibre Channel RAID storage options allow the system to tolerate failures without affecting important applications. Origin 2000 also supports IRIS FailSafe™ software for your business-critical applications, providing failover capability among two or more modules to ensure uninterrupted application availability.

Investment Protection

Origin 2000 is designed to run application software written for today's shared-memory execution environment and is binary compatible with other SGI workstations and servers. This feature protects your investment in existing IRIX® application software, facilitates new application development, and ensures availability of a wide range of open systems software for future use.

Origin 2000
Technical Specifications

Processor Data

• Microprocessor	MIPS RISC R10000® or R12000™ 64-bit CPU
• Primary caches	32KB two-way set-associative on-chip instruction cache 32KB two-way set-associative on-chip data cache
• Secondary cache	4MB or 8MB cache per CPU

Node Card

• CPU capacity	2 R10000 or R12000 CPUs
• Memory capacity	Up to 4GB ECC SDRAM
• Hardware cache coherency	Yes
• Interleaving	4-way per node card
• Memory bandwidth	680MB/sec sustained, 780MB/sec peak

Deskside System or Rack Module

• Processors	1 to 4 node cards, 2 to 8 CPUs
• I/O bandwidth	5.0GB/sec sustained, 6.24GB/sec peak
• I/O boards	12 XIO or 11 XIO and 3 PCI 32- or 64-bit
• Internal peripherals	5 3.5" Ultra SCSI devices, 1 5.25" CD-ROM
• Independent power	Yes
• Redundant power	Optional
• Redundant cooling	Yes

Maximum Rack System

• Processors	1 to 256 node cards, 2 to 512 CPUs
• I/O bandwidth	80GB/sec sustained, 100GB/sec peak
• I/O boards	192 XIO or 184 XIO and 24 PCI 32- or 64-bit
• Internal peripherals	512 3.5" Ultra SCSI devices, 64 5.25" SCSI devices
• Independent power	Yes
• Redundant power	Optional
• Redundant cooling	Yes

Storage I/O Devices

XIO Cards Supported

- Base I/O includes internal SE Ultra SCSI, external SE Ultra SCSI, 10/100Base-TX, two 460Kb/sec serial ports
- 4-port Ultra SCSI (3 differential, 1 SE or differential)
- 2-port Fibre Channel (copper or optical) for direct attach
- 2-port Fibre Channel (optical only) for fabric attach
- 1-port Fibre Channel for direct and fabric attach

PCI-64 Cards Supported

- 2-port Fibre Channel (copper or optical) for direct attach
- 2-port Fibre Channel (optical only) for fabric attach
- 1-port Fibre Channel (copper or optical) for direct and fabric attach

Network I/O Devices

XIO Cards Supported

- Base I/O includes internal SE Ultra SCSI, external SE Ultra SCSI, 10/100Base-TX, two 460Kb/sec serial ports
- 4-port 100Base-TX and 6 460Kb/sec serial ports
- Gigabit Ethernet
- 1-port dual-attached FDDI
- 1-port single-attached FDDI
- 1-port or 4-port ATM OC3
- 1-port ATM OC12
- GSN* (Gigabyte System Network)
- 1-port HIPPI serial (200MB/sec)
- Digital Video I/O (CCIR601)

PCI-64 Cards Supported

- 1-port dual-attached FDDI
- 1-port single-attached FDDI

**GSN available Q3, 1999*

I/O Expansion Devices

- XIO to internal PCI (3 slots) adapter
- XIO to external VME adapter (6U and 9U)

Mass Storage

• Interfaces	Ultra SCSI and Fibre Channel
• Maximum bandwidth	40MB/sec Ultra SCSI, 100MB/sec Fibre Channel
• Device capacity	9.1GB, 18.2GB
• External storage	Rack-mount vaults, 6 3.5" devices Ultra SCSI 10 3.5" devices Fibre Channel
• RAID	Fast/Wide SCSI rack (80 3.5" devices)
• Maximum capacity	8.6TB per module (Ultra SCSI) 43.6TB per module (Fibre Channel) 171.8TB per module (Fibre Channel RAID)

Graphics

- IRISconsole™, InfiniteReality®

Dimensions and Weights

• Deskside system	25.5" H, 23" D, 21" W (65 cm H, 58 cm D, 53 cm W) 215 lb (98 kg)
• Rack system	73" H, 40" D, 28" W (185 cm H, 102 cm D, 71 cm W) 700 lb (317 kg)

Note: weights assume that modules are fully configured with processors, I/O, and peripherals.

Environmental (Nonoperating)

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

Environmental (Operating)

• Temperature	+5° to +35°C, altitude 5,000 MSL +5° to +30°C, altitude 10,000 MSL
• Humidity	10% to 90% noncondensing
• Noise	50 dBa (deskside), 55 dBa (rack)

System bandwidth

System bus bandwidth as measured by bisection bandwidth sustained (peak)

System size (CPUS)	Bisection bandwidth without Xpress links	Bisection bandwidth with Xpress links
8	1.25GB/sec (1.56)	2.5GB/sec (3.12)
16	2.5GB/sec (3.12)	5GB/sec (6.24)
32	5GB/sec (6.24)	10GB/sec (12.5)
64	10GB/sec (12.5)	N/A
128	20GB/sec (25)	N/A
256	40GB/sec (50)	N/A
512	80GB/sec (100)	N/A

Electrical and Power

• Voltage (deskside)	110-220 VAC (configuration limits apply at 110 VAC)
• Voltage (rack)	220 VAC single-phase
• Frequency	50-60 Hz
• Heat/power	2,500 W, dissipation 8,500 BTU/hr (deskside) 5,500 W, 18,750 BTU/hr (rack)
• Electrical service/type	NEMA 5-20, type 110 VAC @ 20amp (deskside) NEMA 6-20, 208 VAC @ 20amp (deskside) NEMA 6-30, 208 VAC @ 30amp (rack)

Software

• System software	IRIX® 6.5 ASE, X/OPEN XPG4 BASE 95, IEEE POSIX 1003.2, and 1003.1b, 1003.1c FIPS 151-2, UNIX® System V.4, 4.3 BSD extensions, MIPS ABI, SVID issue 3, XIIR6, 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+
• Server software	XFS™ 64-bit journaled filesystem with guaranteed rate I/O, IRIS NetWorker, Performance Co-Pilot™ system and network performance monitoring software, System MIB (Provision), Software Distribution (Propel)
• Compilers	ANSI C, C++, Fortran 77, Ada, Pascal, Power C Accelerator (PCA), Power Fortran 77, Fortran 90, Power Fortran 90
• PC/Macintosh® integration	Syntax TotalNet Advance server, supports Windows® 95 and Windows NT® (SMB), NetWare™, AppleShare®, Samba environments for PC and Macintosh
• Security	Trusted IRIX™ B1 security, Commercial Security Pack (CSP)
• Web server	Netscape® Enterprise server

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