



CRAY SX-6 SCALABLE VECTOR SOLUTIONS

PROVEN & PRODUCTION READY



ABSOLUTE PERFORMANCE

Designed to meet the needs of the global HPC community, the Cray SX-6™ supercomputer is a powerful and efficient tool for accelerating breakthroughs on some of the world's most complex problems. The Cray SX-6 system is a high-end capability platform for industrial, academic, and government applications requiring intense computing power, very large high-performance memory and high I/O rates.

Delivering high absolute performance through powerful processors, this easy-to-operate system maintains traditional vector strengths, such as high-memory bandwidth and automatic vectorization and parallelization. The Cray SX-6 scalable, parallel vector supercomputers offer superior reliability in a balanced, commercial-quality system.

SCALABLE VECTOR ARCHITECTURE

Cray scalable vector systems offer the unique combination of very powerful processors and high-bandwidth memory. The Cray SX-6 system architecture uses parallel vector processors to form symmetric multiprocessing (SMP) nodes as building blocks. The system also offers scalability through multiple-node configurations, which deliver superior sustainable performance in a capability-class system.

A single Cray SX-6 node offers two to eight vector processors, each with eight gigaflops of performance. Each processor shares a uniform high-performance memory of 16 to 64 gigabytes capacity, and up to 256 gigabytes per second of bandwidth. A single-node Cray SX-6 supercomputer provides high bandwidth and low latency access to uniform shared memory.

For applications that can use more than eight processors, a multi-node configuration delivers a powerful combination of shared and distributed memory features. Multi-node configurations provide a single-system image through an IXS inter-node crossbar switch. Multi-node systems offer up to eight teraflops of performance, eight terabytes of memory and an I/O bandwidth of more than 800 gigabytes per second.

Multi-node configurations extend the capabilities of single node shared-memory capacity and processor count by providing a tightly-coupled combination of shared and distributed memory environments. Users can manage a multi-node system as a flexible cluster with a single-system image. Multi-node systems support the dynamic introduction and removal of nodes, checkpoint/restart, the SX-GFS global file system, multi-node NQS and other features needed in a state-of-the-art supercomputer.

SYSTEM STRENGTHS

The Cray SX-6 system runs the UNIX-based SUPER-UX operating system. Since its introduction in 1990, SUPER-UX has earned a reputation for reliability, maturity, and efficiency in diverse environments. SUPER-UX includes features to support high-speed I/O, large-scale job scheduling, accounting, and security. Key enhancements include multi-node scalability and operation, global shared memory software, an enhanced NQS batch subsystem, configuration and logical partitioning options, high-performance file systems, checkpoint/restart, multilevel security options, and file archiving management. The Cray SX-6 system supports a variety of industry-leading third-party applications.

The Cray SX-6 supercomputer uses the most up-to-date semiconductor and packaging technologies. The eight-gigaflops processor is fully integrated onto a single chip. The result is a highly reliable processor with low power consumption and reduced interconnect latencies. The Cray SX-6 system provides superior total cost of ownership when compared to commodity systems. A small footprint and air-cooling mean that Cray SX-6 supercomputers deliver more sustained performance per square foot without sacrificing traditional vector strengths.

SUPERIOR RELIABILITY

The Cray SX-6 superior reliability makes it an attractive platform for real-world sustained performance and capability computing. Its role in an evolutionary product line ensures compatibility with other SX systems and an established roadmap to protect customers' investments. With up to eight teraflops of performance, renowned Cray service, and a price competitive with commodity servers, the Cray SX-6 supercomputer is scalable, easy to operate, and cost-effective to own.

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PRODUCT OVERVIEW
NOVEMBER 2002



CRAY SX-6 COMPREHENSIVE ENVIRONMENT

NOVEMBER 2002
TECHNICAL DATA

CRAY SX-6 REPRESENTATIVE CONFIGURATIONS

	SX-6i	SX-6/4B	SX-6/8A	SX-6/16M2	SX-6/256M32
CPUs (NODES)	1 (1)	4 (1)	8 (1)	16 (2)	256 (32)
MEMORY CONFIGURATION	8 GB	32 GB	64 GB	128 GB	2 TB
MEMORY BANDWIDTH	32 GB/s	128 GB/s	256 GB/s	512 GB/s	8 TB/s
IXS NETWORK BANDWIDTH	N/A	N/A	N/A	16 GB/s	256 GB/s
PERFORMANCE	8 Gflops	32 Gflops	64 Gflops	128 Gflops	2 Tflops

SPECIFICATIONS

- 8 Gflops vector-processing CPU
- Up to 8 CPUs and 64 GB of memory per shared-memory SMP node
- Memory bandwidth of 32 GB/s per CPU
- Scalable up to 128 nodes per system (1024 CPUs, 8 Tflops, 8 TB)
- High-performance IXS inter-node crossbar network (8 GB/s bidirectional channels)
- Expandable I/O architecture with independent I/O processors
- Compact, air-cooled chassis
- SUPER-UX UNIX-based operating system with supercomputer features such as high-performance file systems and checkpoint/restart
- Parallel programming environment with Fortran 95 and C/C++ optimizing and vectorizing compilers, OpenMP and MPI shared-memory and distributed-memory models, and tools for debugging and optimization analysis

SX-6i

The Cray SX-6i system is a complete vector-processing system consisting of a single SX-6 CPU with eight gigaflops of performance. The processor is fit with 4 or 8 GB of memory and system disks in a compact, desk-side chassis. The Cray SX-6i is binary compatible with other SX-6 systems and provides balanced processing performance, memory bandwidth, and I/O throughput. It is ideal for a researcher or software developer who needs the power of a vector supercomputer and to use it freely and independently. The SX-6i is also available in rack-mount configurations.

SX-7

The Cray SX-7 system is a special model of the SX-6 that supports a larger SMP node with up to 32 processors and 256 GB of memory. It uses the same vector-processing CPU as the SX-6 with a 10% faster clock. The SX-7 is suitable for applications that require more than eight processors that share a large, flat memory image.

CRAY INC



CORPORATE HEADQUARTERS 411 First Avenue South Suite 600 Seattle WA 98104-2860
TELEPHONE 206 701 2000 FAX 206 701 2500 E-MAIL info@cray.com WEB www.cray.com

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