

SC1458

Up to 2.1TFlops in a single, self contained cabinet. Achieve more with the world's most efficient computer, right in your lab or office. No Data Center required: Unpack, Plug in, Turn on.

The SiCortex SC1458 is an entirely new kind of HPC computer: up to 1,458 64-bit processors that deliver the highest performance-per-watt for HPC systems in its class, based on the HPCC benchmark suite. Compact, self-contained, and powered by a single 208V circuit—the same outlet that powers your home clothes dryer—the SC1458 requires minimal cooling and no site preparation. No need to isolate this system in a data center; install the SC1458 where your users do their best work. Further, the ultra-high reliability of the system frees you from the need for expensive support staff. In fact, some of our customers assign that task to a graduate student – a clear metric of confidence that underscores the independence from that costly data center.

SiCortex computers are the most reliable HPC systems on the market. This reliability is built into the design, starting with simplicity of board design. The boards have processor node chips, memory chips, and I/O sockets; all linked with the industry's fastest interconnect fabric. That is all – none of the superfluous components that come with conventional HPC systems built with commodity chips designed to solve general computing tasks. The story continues with pervasive error checking and correction (ECC), even in the cache memory.

The final element of the SiCortex reliability story is its unique, self-cooling cabinet. Air is drawn in through the intake at the cabinet's midsection and flows straight up and out the top, keeping everything inside cool and running smoothly.

To complement the unique hardware design is the powerful development and operating environment built on standard Linux. All components are pre-integrated, pre-installed and tuned before the SiCortex system leaves our factory. The compilers, libraries, Lustre parallel file system, tools, complete support for error checking/correction and performance monitors are in place and working together.

“We at UMaine are focused on responsible computing: achieving more with fewer resources. It's easy to overlook the fact that for every watt of electricity used to run these large computers, up to another watt is required to cool the system. By choosing the most energy-efficient supercomputer available, we are providing state-of-the-art computing to our students and faculty, while minimizing our energy requirements.”

—George Markowsky, acting chairman of the UMaine Computer Science Department



- Industry standard Linux: pre-integrated and installed. Compilers, libraries, Lustre parallel file system, system management tools.
- Scalable: 324 processors (2 boards) to 1,458 processors (9 boards), delivering up to 2.1 TFlops.
- Memory to spare: configure 4GB or 8G per node, up to 1.9 TB for the total system.
- Quick: the industry's fastest interconnect fabric based on the de Bruijn graph topology.
- Quick again: SiCortex FabriCache™ implementation allows nodes to reserve portions of their own RAM to act as solid-state disks.
- Designed for maximum uptime: low head output coupled with effective air cooling; error checking and correction (ECC) everywhere.

The SiCortex Software Environment

The SiCortex software environment provides a powerful and fully integrated set of tools to support applications, combining maximum user-level performance with minimum system management overhead. All components of the environment have been tested together and pre-loaded into each SiCortex system prior to shipment, eliminating a major source of user integration effort and potential error.

SiCortex systems run standard Linux, rooted in the Linux 2.6 kernel, from linux-mips.org, continually updated. Changes to the kernel are minimal: they enable features such as native support of the Lustre file system, application performance monitoring, and extremely fast MPI. The standard Linux EDAC framework has been extended to reach the SiCortex hardware's pervasive use of ECC, which includes the L1 and L2 caches.

- Unified Open Source development environment and the PathScale Optimizing Compilers for Fortran, C and C++
- Rich debugging infrastructure, including memory debugger, GDB, and TotalView parallel debugger (license required).
- The industry's leading integrated, easy-to-use parallel performance analysis tool suite, including PAPI support and sophisticated TAU and Vampir (license required) visualization tools
- Rich selection of optimized open source scientific libraries for the SiCortex architecture, including fast math and string libraries, FFTW, PETSc, ATLAS, Scalapack and more.
- Optimized MPI implementation based on MPICH-2 and supports all MPI-1 operations and most MPI-2 operations, including MPI I/O. All nodes can also use standard TCP/IP over the fabric.
- Predominantly Open Source-based tools and codes; source code available for nearly everything
- 1000's of additional open source packages available through 3rd party repositories.
- Extensive online documentation library and an active user forum.

SiCortex systems include a System Service Processor (SSP), the focal point for user account management, system management, activity monitoring, environmental monitoring, job scheduling, logging, and booting. It is also the central storage and distribution point for operating system images and communications parameters. The SSP provides a convenient unified view for managing and monitoring the entire system.

For further information, refer to the SiCortex Software and Development Environment data sheet.

SiCortex High Productivity Computer Systems	SC072-PDS Personal Development System	SC1458 Entry/Mid-range System	SC5832 High Capability System
Minimum Processors	72	324	1,944
Maximum Processors	72	1,458	5,832
Maximum Memory	96 GB	2 TB	8 TB
Performance (Flops)	100 GF	2 TF	8 TF
Power Draw	300 Watts	<5 kWatts	<20 kWatts
Voltage	100-240VAC, single-phase	200-240VAC, single-phase	208VAC, three-phase (3P+E); 230/400VAC, three-phase(3P+N+E)
Current	3A (100-120V); 1.5A (200-240V)	26A	64A (208V); 34A (400V)
Frequency	50-60Hz	50-60Hz	50-60Hz
Maximum Heat	1,020 BTU/hr	17,700 BTU/hr	70,300 BTU/hr
Dimensions	18" H x 8.1" W x 23" D	70" H x 23" W x 42" D	72" H x 60" W x 60" D
Clearance	Left 3", right 0"; front and rear, 3"	Left 2.5" right, 0" front and rear 36"	Left and right, 18"; front and rear, 36"; above 22"
Maximum Weight	41 lb	470 lb	1500 lb
Operating Temperature	10-35C (50-95F), less 1C/300m above sea level (1.8F/1000') to a maximum of 3000m (10,000')		
Relative Humidity	20-80%, non-condensing		
Non-operating Temperature	-40-70C (-40-158F)		

- The computers above are classified as information technology equipment (ITE) and carry the CSA, CE, FCC, and VCCI marks.
- The computers above are compliant with CSA 22.2 60950-1 and EN 60950-1.
- The computers above are Class A computing devices compliant with FCC Part 15 Subpart B, EN 55022, EN 55024, ICES-003, VCCI, CNS 13438, and AS/NZS 3548.

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About SiCortex

Headquartered near Boston, Mass., SiCortex, Inc. makes the world's most energy-efficient high-productivity computers. Its proven architecture was designed from the silicon up to provide breakthrough delivered performance at the lowest power consumption in the industry. SiCortex computers scale from 72 to 5,832 processors running standard Linux and other open-source codes, in packages ranging from deskside to departmental to data center. SiCortex systems are the compute-power behind some of the most important research initiatives at the country's national laboratories and academic institutions. For more information, visit sicortex.com