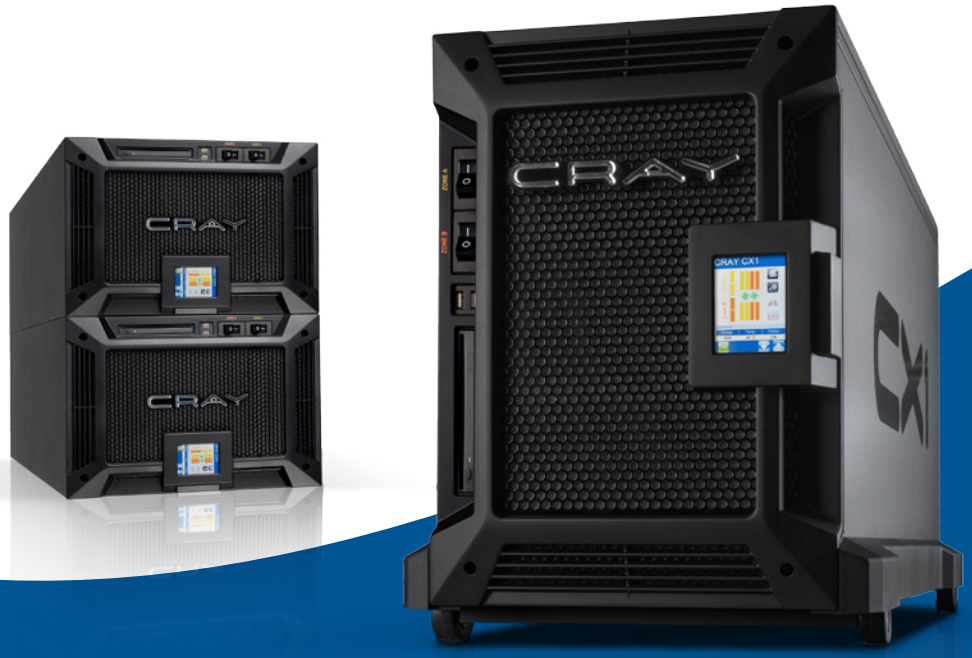
CRAY CX1

Who says world-class high performance computing (HPC) should be reserved for large research centers? The Cray CX1™ supercomputer makes HPC performance available to everyone, combining the power of a high performance cluster with the affordability, ease-of-use and seamless integration of a workstation. Equipped with powerful Intel® Xeon® processors and state-of-the-art visualization and storage capabilities, the Cray CX1 supercomputer delivers industry-leading performance across a broad range of applications and standard benchmarks, all in a compact, deskside system that plugs into a standard wall outlet. And, with an integrated Microsoft® or Linux operating environment, the Cray CX1 supercomputer delivers true "ease of everything" computing, allowing any user to apply HPC power to challenging science, engineering and design problems. Designed and priced for individuals and departmental workgroups, the Cray CX1 system is simple to configure, deploy, administer and use. With the Cray CX1 supercomputer, Cray takes the HPC cluster out of the data center and places it next to your desk.



A New Era of High Performance Computing

Scientists and engineers know that HPC can make all the difference – taking days or weeks off project timelines and solving problems that would otherwise be unapproachable. Unfortunately, until now HPC has been available only to the few. Those computational scientists who could master a domain science, program in parallel, distribute algorithms, manage an HPC cluster, and were fortunate enough to work in an organization with supercomputing resources could put HPC to work. For the rest, technical problems languished on the desktop – stuck on a scientist's or engineer's workstation, slowing time to market and negatively affecting cost, competitiveness and quality.

With the Cray CX1 supercomputer's breakthrough power, affordability and ease of installation and use, Cray is democratizing HPC – placing computing capabilities previously reserved for large research centers into the hands of technical workstation users. The Cray CX1 supercomputer makes easy work of complex applications used in the financial services, manufacturing, digital media, life sciences and energy industries, as well as traditional applications used in government, defense and higher education sectors.

Designed for Performance

Designed and optimized for HPC, the Cray CX1 supercomputer delivers industry-leading performance at an affordable price. Drawing on the system's best-of-breed, industry-standard hardware and software, researchers and scientists can tackle the most challenging computational problems. The Cray CX1 supercomputer is a complete high performance product – not an assembly of components typical of HPC clusters.

"Ease-of-Everything" Computing

Until now, a huge chasm has separated the conventional workstation from the HPC cluster. The Cray CX1 supercomputer bridges this gap, taking the HPC cluster out of the data center and putting it at the deskside.

Traditional clusters require substantial power, space and cooling which typically require significant IT infrastructure and support, as well as translating to large carbon footprints. The Cray CX1 supercomputer was designed from the ground up to provide a leaner, more energy-efficient HPC solution, achieving power efficiency as high as 93 percent.

HPC clusters are also difficult to use, requiring complex software environments that are hard for individuals to access, let alone optimize for results. With the Cray CX1 system, users don't need elaborate programming knowledge or a large IT staff to manage a complex HPC cluster. Instead, individual users or departments can easily operate and maintain the system themselves.

The Cray CX1 supercomputer comes with an integrated solution stack that provides a simplified, common operating environment for either Windows or Linux along with several system management packages. The intuitive HPC environment simplifies job submission, status and progress monitoring, and delivers maximum compute performance and scalability to the end user. The system ships with preinstalled OS and cluster software, enabling a quick path from setup to user productivity. It features competitive pricing and a modular design, allowing users to continually incorporate new technology over time and protect their investment.

Purpose-Built for Offices, Labs and Workgroups

In the past, high performance computing meant having a dedicated data center that could meet the unique requirements of cluster systems. Today, the Cray CX1 supercomputer can deliver industry-leading HPC performance in a system that rests in a simple deskside pedestal and plugs into a standard wall outlet. The Cray CX1 system is unexpectedly quiet, incorporating innovative active noise reduction technology and complying with NR45 office noise regulations.

The system can be easily expanded by connecting up to three chassis with the system's internal switch infrastructure. The system supports Layer-2/Layer-3 Gigabit Switch and InfiniBand DDR/QDR interconnects offering extraordinary scalability.

World's Most Versatile Cluster

The Cray CX1 supercomputer is the only HPC system in the industry to combine high performance compute, graphics and storage capabilities in a single, integrated office-environment chassis. This versatility allows for incredible utilization flexibility. For example, the system's high-end visualization capabilities can often eliminate the need for a separate workstation.

Each Cray CX1 chassis can be configured with up to eight blades. Blades can include a variety of single- and dual-socket compute, graphic, storage and GPGPU blades.

World-Class Service and Support

In addition to offering industry-leading technology and a comprehensive software environment, the Cray CX1 supercomputer also includes world-class Cray certified support. The system includes a three-year parts and labor hardware warranty, call center technical support and next-business day onsite service. Customers also have a variety of options for ongoing software support. Together, these proven Cray support services enable users to receive fast, expert assistance with any technical issue.

CX1

"Ease of Everything" Computing

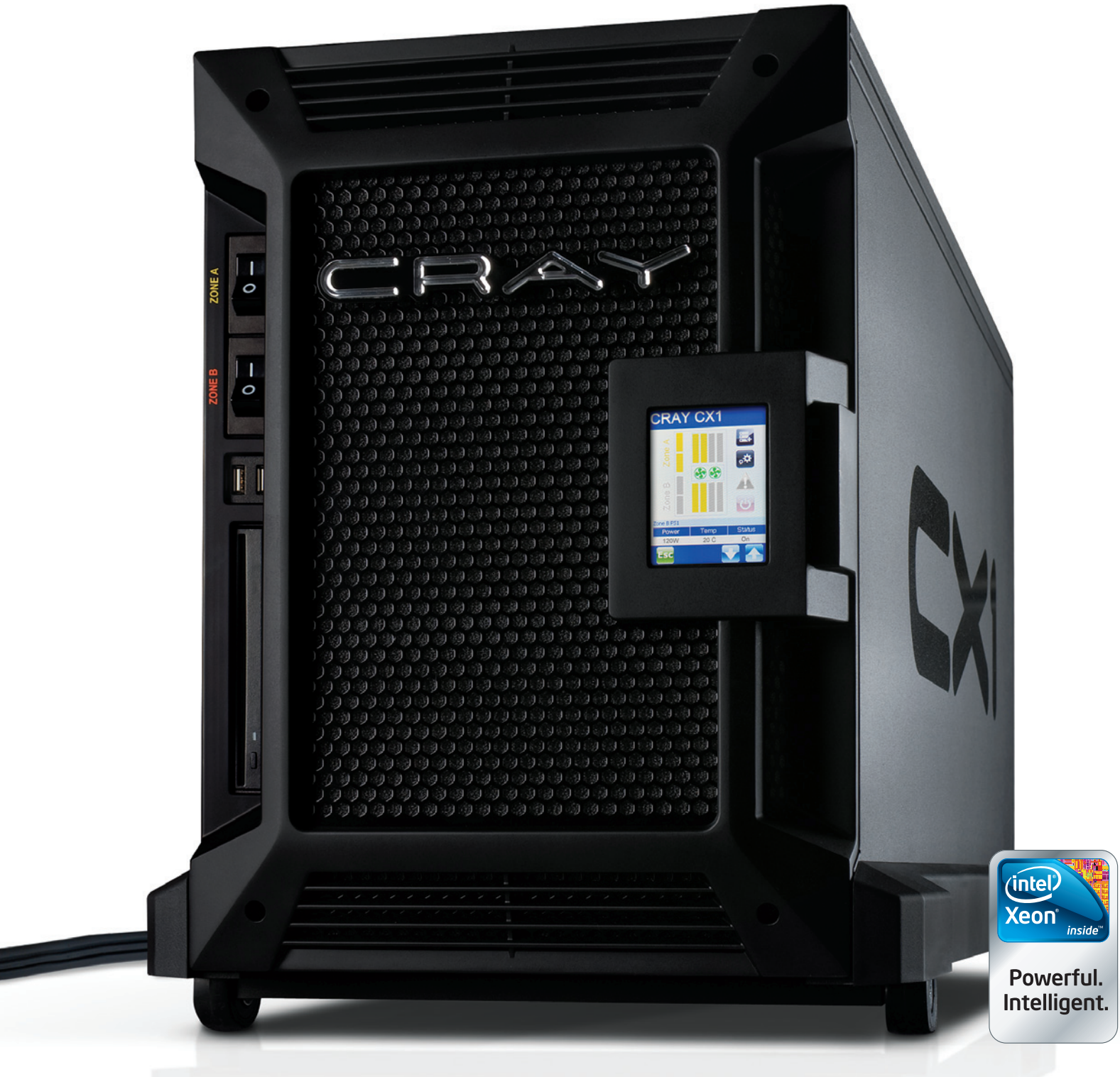
- Integrated HPC Operating Environment for Windows and Linux
- Simple Setup and Operation
- Affordably Priced

Designed for Performance

- Configured and Optimized for HPC
- Industry-Standard Hardware and Software

World's Most Versatile Cluster

- Up to Eight Blades per Chassis
- Mix-and-match Compute, Graphic, Storage and GPGPU blades



intel Xeon inside™

Powerful. Intelligent.

Specifications

Chassis Enclosure	**Form Factor:** 7U modular enclosure (rackmount and/or pedestal) **Dimensions:** W 12.22" (31.04 cm) x H 17.5" (44.45 cm) x D 35.5" (90.42 cm) **Weight:** • Chassis with all I/O modules (Gigabit and InfiniBand) and power supplies - 62.2 lbs (28.3 kg) • Chassis fully loaded w/ blades and I/O modules - 136.6 lbs (62 kg)
Power Supplies	**1600 watt hot-plug power supplies** • Based on high efficiency and "power factor correction" ◦ 1600W @ 120V = 13.33A (92% efficiency: 14.40A) ◦ 1600W @ 220V = 6.66A (92% efficiency: 7.19A) • Redundant power supplies support 2+2 (fully pop., full redun.) or 1+1 (half pop., full redun.) or 1 or 2+0 (non-redun.) modes • Power supplies require 110 or 200+ volt AC input • Cray offers a wide range of power distribution options **Dimensions:** W 4.274" (108.56 mm) x H 1.543" (39.19 mm) x D 21.52" (546.61 mm) **Weight:** 5.9 lbs (2.68 kg)
Cooling Fans	Chassis comes standard with hot pluggable, redundant fan modules based on Smart Energy Technologies
Input Device	Front control panel with touch screen graphical LCD • Supports initial configuration wizard • Local server nodes, enclosure and module information Two USB "pass-throughs" in front and back
Enclosure I/O Modules	Up to two fabrics, featuring Ethernet switches providing uplink scalability and high speed InfiniBand modular switches (8 ports SDR, 12 or 24 ports DDR)
	Ethernet Switch **16 RJ-45 auto-sensing 10/100/1000 Mbps UTP ports** • Bandwidth: 32 Gbps (non-blocking) • Forwarding Mode: Store-and-forward • Forward rate: 10 Mbps port = 14,800 packets/sec; 100 Mbps port = 148,000 packets/sec; 1000 Mbps port = 1,488,000 packets/sec • Latency: 100 to 100 Mbps = 40 µ (max); 1000 to 1000 Mbps = 10 µ (max) • Queue buffer memory: 512 Kbytes per port • Status LED: Power, activity and link indicators for each port, link and speed indicators built into each RJ-45 port **IBS12DDR/IBS24DDR 12 or 24 Ports InfiniBand Switch** **IBS12DDR - 12-4X 10/20Gbps (SDR/DDR) CX4 ports with support for optical adapters and cables** • Subnet Management software • Embedded management with Linux OS with Ethernet and secure shell access • Ultra-low latency < 180ns • InfiniBand v1.2 compliant • Dual redundant auto-sensing • Status LED: Power, activity and link indicators for each port, link and speed indicators built into each CX4 port • IBS24DDR–Optional 12-4X 10/20Gbps CX4 ports daughter card (for a total of 24 ports) • 480Gb/s (SDR) or 960Gb/s (DDR)
Management	**Web-based Remote System Management** • Graphical Mode Console Redirection • Performance monitoring • System Management: Local System Management Application, Windows Management Instrumentation (WMI) • Reports: System Information, Health Log, Adminstration, Application for Local Management • Pager Alerts and E-mail Alerts • SNMP support • Health monitoring: CPU and System Temperatures, System Voltages, CPU and Chassis Fans, Power Failure

CRAY
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