

Cray XC30-AC™ Supercomputer

The Cray XC30™ air-cooled supercomputer series architecture is designed from the ground up to be adaptive. A holistic approach optimizes the entire system to deliver sustained real-world performance and extreme scalability across the tight integration of all HPC hardware, networking and software.



Economical Supercomputing for Technical Enterprise Markets and Price Points

Cray is the leader in high-end supercomputing. Our systems are the most scalable, best performing supercomputers in HPC and include the biggest and fastest machines in the world. The Cray XC30-AC™ series leverages the innovations of the top line Cray XC30 technology (see the Cray XC30 supercomputer brochure for a comprehensive description) while economizing the packaging, networking, cooling and power options to provide users with the optimal balance of features and footprint to meet their unique price/performance requirements. This air-cooled family provides slightly smaller and less dense supercomputing cabinets with no requirement for liquid coolants or extra blower cabinets. A reduced network topology lowers costs and the systems are completely compatible with the compute technology, OS, ISV and software stack support of the high-end Cray systems.

Cray XC30-AC Supercomputer – Compute Blade

The Cray XC30-AC supercomputer leverages the same compute node, compute blade and daughter card (PDC) architecture as the Cray XC30 liquid-cooled supercomputer, amortizing R&D expenses and reducing the cost of ownership. System blades have four compute nodes of two processor engines each, the same as the Cray XC30 system. Compute blades stack vertically in a chassis of 16 blades per cabinet and the systems can be configured from one to eight cabinets each, enabling up to 1,024 sockets.

Common Interconnect and Networking

The Cray XC30-AC supercomputer utilizes the same performance-optimized Aries™ interconnect technology on the compute blades as the flagship systems, and takes advantage of the two ranks of the Dragonfly network topology. Individual, single-cabinet configurations connect the compute blades via a rank 1 backplane, and eliminate the need for external cables of any kind. For 2-to-8 cabinet configurations, the Cray XC30-AC system implements a second rank of a passive electrical (copper) cable network to connect compute chassis in different cabinets. By comparison, the high-end Cray XC30 series can utilize an additional third rank option of active optical cables to drive communication for much larger system configurations.

Power and Cooling - Efficient Alternatives

To provide streamlined, cost-reduced solutions for technical enterprise environments, the air-cooled Cray XC30-AC system makes each cabinet independent of requirements for fluid infrastructure or additional blower enclosures. A single high-efficiency fan per cabinet blows bottom-to-top airflow to keep these less densely populated configurations cool. Technical enterprise datacenters without raised floors or plumbing for liquid cooling systems may also have different power requirements, so the Cray XC30-AC family provides support for common computer room options like 480V or 208V.

Details on the Cray XC30™ supercomputer series, software, and processor daughter cards can be found by visiting:
<http://www.cray.com/Products/Computing/XC>

Cray XC30-AC™ Series Specifications

Processor	64-bit Intel® Xeon® processor E5 family: up to 128 per cabinet
Memory	32-128GB per node
	Memory bandwidth: up to 117GB/s per node
Compute Cabinet	Up to 128 sockets per cabinet, upgradeable with processors of varying core counts
	Peak performance: initially up to 33 TFLOPS per system cabinet
Interconnect	1 Aries routing and communications ASIC per four compute nodes
	48 switch ports per Aries chip (500GB/s switching capacity per chip)
	Dragonfly interconnect: low latency, high bandwidth topology
System Administration	Cray System Management Workstation (SMW)
	Single-system view for system administration
	System software rollback capability
Reliability Features (Hardware)	Integrated Cray Hardware Supervisory System (HSS)
	Independent, out-of-band management network
	Full ECC protection of all packet traffic in the Aries network
	Redundant power supplies; redundant voltage regulator modules
	Redundant paths to all system RAID (configuration dependent)
Reliability Features (Software)	Hot swap power supplies and compute blades
	Integrated pressure and temperature sensors
	HSS system monitors operation of all operating system kernels
	Lustre file system object storage target failover; Lustre metadata server failover
	Software failover for critical system services including system database, system logger and batch subsystems
Operating System	NodeKARE (Node Knowledge and Reconfiguration)
	Cray Linux Environment (includes SUSE Linux SLES 11, HSS and SMW software) Extreme Scalability Mode (ESM) and Cluster Compatibility Mode (CCM)
Compilers, Libraries & Tools	Cray Compiler Environment, Intel Compiler, PGI Compiler, GNU compiler
	Support for the ISO Fortran standard (2008) including parallel programming using coarrays, C/C++ and UPC
	MPI 2.0, Cray SHMEM, other standard MPI libraries using CCM; Cray Apprentice and CrayPat performance tools; Intel Parallel Studio Development Suite (option)
Job Management	PBS Professional job management system
	Moab® Adaptive Computing Suite job management system
	SLURM – Simple Linux Unified Resource Manager
External I/O Interface	InfiniBand, 10 Gigabit Ethernet, Fibre Channel (FC) and Ethernet
Disk Storage	Full line of FC, SAS and IB based disk arrays with support for FC and SATA disk drives, SONEXION data storage system
Parallel File System	Lustre, Data Virtualization Service (DVS) allows support for NFS, external Lustre and other file systems
Power	30 kW per compute cabinet, maximum configuration
	Support for 480, 400, 230, 208 and 200 VAC computer rooms
Cooling	Air cooled with bottom to top airflow: 3,000 cfm intake
Dimensions (Cabinet)	H 80.75 in. x W 27.65 in. x D 64.00 in.
Weight (Cabinet)	1,500 lbs maximum operational
	1,800 lbs maximum shipping
Regulatory Compliance	EMC: FCC Part 15 Subpart B, CE Mark, CISPR 22 & 24, ICES-003, C-tick, VCCI
	Safety: IEC 60950-1, TUV SUD America CB Report
	Acoustic: ISO 7779, ISO 9296

CRAY XC30

