SMARTER CLUSTER SUPERCOMPUTERS
Extending the boundaries of what you can achieve takes reliable computing tools matched to your workloads. That’s why we tailor the Cray® CS500™ cluster supercomputer to your requirements. The CS500 system is customizable, easy to manage, and based on industry standards. It can handle the broadest range of modeling, simulation, analytics, and artificial intelligence workloads. And we configure it to meet your needs.

We optimize components and integrate them into a powerful high-performance compute environment that can scale to over 11,000 nodes and 60+ peak petaflops. Flexible node configurations feature the latest processors and interconnect technology. Expertly engineered software simplifies system administration and maintenance. And it’s all backed by renowned Cray expertise and support.

- Flexible computing performance
- Designed for your workload
- Reliable and energy efficient
- Expert Cray support
SCALABLE CONFIGURATIONS

EXPERTLY OPTIMIZED FOR MULTIPLE USES: ALL-PURPOSE, COMPUTE- OR DATA-INTENSIVE, AND HYBRID WORKLOADS
Cray CS500 cluster supercomputers are designed for your workloads.

Choose from a wide range of flexible configurations with the latest processors and accelerators from Intel, NVIDIA, and AMD. Select your chassis, blades, nodes, interconnect topology, storage, and system management capabilities. We optimize industry-standard server nodes and components and pair them with a comprehensive software stack.

What you get is a unified HPC system that excels at compute, data, or hybrid workloads. And it’s all designed, installed, and supported by Cray supercomputing experts.
FLEXIBLE COMPUTING PERFORMANCE

SCALABLE CONFIGURATIONS
The CS500 cluster supercomputer can be customized for multiple uses — from an all-purpose, massively parallel HPC system to a cluster optimized for hybrid compute- and data-intensive workloads.

Each system has compute nodes and management nodes. Compute nodes run parallel MPI and OpenMP tasks with maximum efficiency. Management nodes provide I/O connectivity, function as login nodes, and can be configured for unique workloads requiring large memory configurations.

Cray rackmount servers are highly configurable in an HPC-optimized, industry-standard package. Each configuration can be replicated to create a reliable and powerful large-scale system.

Choices include:
- Cray 3211 high-density (4 nodes in 2U) rackmount servers with Intel® Xeon® Scalable processors
- Cray 1211 rackmount servers with Intel Xeon Scalable processors and NVIDIA GPU accelerator support
- Cray 3164 high density (4 nodes in 2U) rackmount servers with AMD® EPYC™ 7000 series processors
- Cray 1164 rackmount servers with AMD EPYC 7000 series processors
- Cray 3264 high density (4 nodes in 2U) rackmount servers with AMD EPYC 7002 series processors
- Cray 1264 rackmount servers with AMD EPYC 7002 series processors
RELIABLE AND ENERGY EFFICIENT
Reliability starts with careful board and component selection, testing, and validation. We add multiple layers of redundancy — power, cooling, management servers, and networks — and fault tolerance to boost your uptime. High-efficiency, load-balancing power options reduce energy loss and boost TCO.

HPC & DEEP LEARNING ENVIRONMENT
Develop and optimize applications and monitor system resources with our complete software environment. The CS500 system’s customizable software stack is compatible with most open-source and commercial applications. It includes Cray-authored components, popular open-source software, and industry-leading applications.

You get:
• Red Hat® Enterprise Linux® or CentOS
• Cray Programming Environment, a complete, fully integrated suite of HPC-optimized compilers, libraries, and tools for programming, debugging, performance analysis, workload management, and more

RELIABLE AND ENERGY EFFICIENT
• Bright Cluster Manager for HPC or Cray’s Advanced Cluster Engine for system management
• Bright for Deep Learning, a comprehensive deep learning environment that includes a choice of machine learning frameworks including Caffe, Torch, Tensorflow, and Theano; and machine learning libraries including MLPython, NVIDIA CUDA Deep Neural Network library (cuDNN), Deep Learning GPU Training System (DIGITS), and CaffeOnSpark

EXPERT CRAY SUPPORT
Mission-critical systems around the globe rely on our service teams for world-class support. Cray support engineers, field engineers, and field analysts are experienced, highly trained, and backed by subject matter experts.

We can program, install, troubleshoot, maintain and administer your system, and optimize your applications. Plus you get access to product support groups and in-house systems to help with diagnostics.

CS500 CONFIGURATION OPTIONS
• Cray rackmount servers
• Intel® Xeon® Scalable processors, AMD EPYC™ processors, and NVIDIA® Tesla® GPU accelerators
• Multiple interconnect options: 3D torus/fat tree, single/dual rail, InfiniBand™, Intel® Omni-Path Architecture
• Local hard drives in each server
• Choice of network-attached file systems and parallel file systems
• Server management options
## CRAY CS500 SPECIFICATIONS

<table>
<thead>
<tr>
<th><strong>ARCHITECTURE</strong></th>
<th>Air cooled, up to 72 nodes per rack cabinet</th>
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<tbody>
<tr>
<td><strong>PROCESSORS AND ACCELERATORS</strong></td>
<td>Support for 64-bit Intel® Xeon® Scalable processors and AMD EPYC™ processors. Optional support for NVIDIA® Tesla® GPU computing accelerators</td>
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<tr>
<td><strong>MEMORY</strong></td>
<td>768 GB up to 1,536 GB depending on processor SKU. Up to 2 TB memory capacity per node</td>
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<tr>
<td><strong>INTERCONNECT AND NETWORKS</strong></td>
<td>EDR or HDR InfiniBand® with Connect-IB®, Intel® Omni-Path Host Fabric Interface. Options for single- or dual-rail fat tree or 3D torus (configurations vary by chassis). 1 GbE and 10 GbE for management. Redundant networks (InfiniBand, 1 GbE and 10 GbE) with failover</td>
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<tr>
<td><strong>SYSTEM MANAGEMENT</strong></td>
<td>Bright Cluster Manager for HPC (optional)</td>
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<tr>
<td><strong>RELIABLE, AVAILABLE, SERVICEABLE (RAS)</strong></td>
<td>Redundant power, cooling, and management servers with failover capabilities. All critical components easily accessible</td>
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<tr>
<td><strong>RESOURCE MANAGEMENT AND JOB SCHEDULING</strong></td>
<td>Options for SLURM, Altair PBS Professional, IBM Platform™ LSF, Adaptive Computing Torque, Maui and Moab, and Grid Engine</td>
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<tr>
<td><strong>FILE SYSTEM</strong></td>
<td>Cray® ClusterStor®, NFS, Local FS (Ext3, Ext4 XFS), Lustre®, GPFS and Panasas’ PanFS® available as global file systems</td>
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<tr>
<td><strong>DISK STORAGE</strong></td>
<td>Full line of FC-attached disk arrays with support for FC, SATA disk drives and SSDs</td>
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<tr>
<td><strong>OPERATING SYSTEM</strong></td>
<td>Red Hat, SUSE or CentOS available on compute nodes. ACE Management Servers delivered with Red Hat Linux®</td>
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<td><strong>PERFORMANCE MONITORING TOOLS</strong></td>
<td>Open source packages such as HPCC, Perfctr, IOR, PAPI/IPM, netperf</td>
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<tr>
<td><strong>POWER</strong></td>
<td>Power supplies deliver up to 38 kW per cabinet, with actual consumption based upon configuration. Optional 480V power distribution with a choice of 208V or 277V three-phase power supplies</td>
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<tr>
<td><strong>COOLING FEATURES</strong></td>
<td>Air cooled. Airflow: up to 3,000 cfm in densest configuration; Intake: front; Exhaust: back. Optional passive or active chilled cooling rear door heat exchangers</td>
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<td><strong>CABINET DIMENSIONS (HxWxD)</strong></td>
<td>42U/19&quot;: 78.39&quot; (1,991 mm) x 23.62&quot; (600 mm) x 47.24&quot; (1,200 mm) standard rack cabinet</td>
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<tr>
<td><strong>CABINET WEIGHT</strong></td>
<td>42U/19&quot;: up to 1,856.3 lbs.; 232 lbs./sq. ft. per cabinet</td>
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<tr>
<td><strong>SUPPORT AND SERVICES</strong></td>
<td>Turnkey installation services with worldwide support and service options</td>
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