Transforming the future of enterprise compute

Accelerate your compute-intensive workloads flexibly and efficiently

Hewlett Packard Enterprise



Strategic adoption of exascale era technologies brings faster insights and greater value to the enterprise:

- Implementing solutions that are purpose-built for supercomputing and AI
- Maximizing performance and lowering total cost of ownership
- Scaling compute elastically to meet changing demands and accelerate innovation
- Increasing visibility and control of IT

Figure 1. HPE Cray XD2000

A new breed of compute

We have entered an age marked by astonishing growth and innovation. Organizations across industries face the challenge to make use of enormous datasets that hold the answers to some of the world's most complex problems. Organizations of all sizes are attempting to unlock more value from their data and convert insights into competitive advantage, which is driving the need for larger and more detailed models and simulations.

Developing new artificial intelligence (AI) algorithms and other data models is critical to gain deeper and more accurate insights. However, these computationally intensive workloads are fast exceeding the capacity of traditional infrastructure. Enterprises must invest in a breed of compute that delivers superior performance, efficiencies, and speed to prepare for the future of business.

Evolving for the exascale era and beyond

Enterprises are undergoing a total transformation as supercomputing becomes increasingly widespread. Accessible exascale era technologies are helping them work faster than before, keep pace with change, and run the most demanding workloads.

Today, enterprises can adopt the same technologies used in the world's fastest supercomputers regardless of their IT needs, experience, or budget. These capabilities are designed to eliminate bottlenecks and deliver the firepower to run enormous workloads, unleashing the true power of supercomputing for the enterprise.

Supercomputing performance made accessible

HPE is reimagining enterprise compute, bringing breakthrough capacity and agility to accelerate innovation. We are committed to helping enterprises accelerate compute-intensive workloads flexibly and efficiently.

Our vision of delivering supercomputing performance to more organizations brought about the HPE Cray XD2000 system. This next gen system is an entirely new architecture, engineered from the ground up for the enterprise. With different models powered by latest generation processors from AMD and Intel®, the HPE Cray XD2000 is designed to accelerate the fastest-growing workloads. Whether it's innovating with AI and analytics or running global operations more economically, these robust systems offer a number of features to streamline critical workloads and prepare enterprises to scale with growth.

HPE is reimagining enterprise compute

HPE is empowering enterprises to achieve better outcomes and set the stage for future growth. We offer a portfolio of supercomputing technologies, tools, and support services for enterprises to secure and maintain competitive advantage. Our supercomputing innovations are accessible, made for breakthrough performance and agility to thrive in the age of exascale.

HPE values flexibility. We carefully integrate and tune each component of the HPE Cray XD2000 to create an environment that can build out, add features, and upgrade infrastructure as needed. The server itself can scale from one node to hundreds or thousands of nodes.

HPE has a long history of helping optimize IT budgets and advancing energy efficiency. That's why the HPE Cray XD2000 is density optimized, offering a complete and scalable solution with power and cooling options to deliver maximum performance at a lower TCO. Enterprises have the choice of air cooling or plug-and-play DLC. Each rack is self-contained and integrated in our liquid cooled factory, and racks can be filled as you go at a linear cost. HPE estimates that 7% more servers can be purchased as a result of liquid cooling energy savings over five years.[1] This means enterprises can cost-effectively scale their environments while saving data center space.

As more enterprises invest in supercomputing technologies to power the next phase of their evolution, HPE knows that securing and managing new infrastructure is a top concern. The HPE Cray XD2000 provides comprehensive systems management tools to ease IT complexity and dramatically reduce risk. We use cutting-edge security features to protect enterprise data and workloads from external and internal threats. At the hardware level, we integrate hardware root of trust with automated firmware recovery to prevent systems from booting with compromised firmware and restore them to the previous working state.

To streamline operations, DMTF compliant Redfish® delivers simple and secure management capabilities from edge to cloud. Redfish is a DMTF protocol providing commonality and server management that defines protocol, schema, and data models to manage servers. Enterprises have access to easy-to-uses tools to monitor and control their supercomputing environments — including converged, hybrid IT, and software-defined data centers.

Deploying exascale era technologies

Purpose-built for supercomputing and AI workloads with a winning combination of exascale era technologies, the HPE Cray XD2000 gives enterprises all the right tools and capabilities to innovate faster, upgrade as needed, and prepare for what comes next.

HPE Slingshot brings together high performance interconnects with Ethernet capability to meet the demands of supercomputing. The ability to deliver consistent, reliable performance and operational efficiency from one rack to the world's largest systems makes it ideal for a mix of supercomputing, AI, analytics, and cloud workloads. HPE Slingshot features high performance switch microarchitecture with Ethernet edge or optimized fabric functionality in each port for high packet throughput and reduced packet overhead in network fabric. The combination of efficient congestion management and low, uniform latency guarantee packet delivery for mixed workloads. Additionally, OpenAPIs to enhance interoperability with storage accelerators and data centers. Applications running on HPE Cray XD2000 nodes can exchange IP/Ethernet traffic more easily and more efficiently to ingest data from external sources.

The HPE Cray XD2000 includes integrated storage options to manage the vast datasets collected and processed by today's organizations. High-performance can scale rapidly with the needs of supercomputing and AI, feeding data continuously to hungry CPUs.

[1] All liquid cooling and air cooling estimates are based on a total of 504 servers each and assume no power constraints within a rack. Estimated cooling costs are based on 10.5 cents per KW/h over a five-year period.

Simplifying supercomputing innovation

Managing the complexities of supercomputing/AI workloads can be difficult and time-consuming. HPE offers a comprehensive software portfolio designed to ease the transition from supercomputing development to production.

HPE Cray Programming Environment has best-in-class programming and performance analysis tools for software development, debugging, and tuning. The suite supports multiple programming languages, programming models, compilers, I/O, and libraries — all fully integrated to improve programmer productivity and application performance with the least amount of effort.

HPE Cray Operating System (OS) is a hardened Linux® operating system enhanced for reliable supercomputing performance. This high performance software suite is designed to run large, complex applications and scale efficiently to more than 500,000 processor cores.

HPE High Performance Cluster Manager is a fully integrated system management solution for HPE clusters and supercomputers. The software provides complete provisioning, management, and monitoring for a few nodes all the way to exascale.

Evolving for the future of business

HPE Cray XD2000 systems tell the story of our evolution at HPE. We are merging Cray supercomputing power, cutting-edge technology, and seamless delivery with the reliability and rich industry experience that make HPE a trusted partner. Through ongoing technology development, our enterprise-level systems are more flexible and provide more choices, no matter the deployment path — on-prem, hybrid cloud, or edge.

Options include:

- **Fabrics:** HPE Slingshot, NVIDIA® InfiniBand, other standard Ethernet options
- **Operating systems:** Cray OS, RHEL 9, RHEL 8.6, SLES 15, SLES NEXT, Windows 2022, Windows 2019, VMware® 8.0, VMware 7.0, Ubuntu 22.04 LTS
- **System management:** HPE High Performance Cluster Manager, Bright Cluster Manager
- **Cooling:** Air-cooling, hybrid cooling with ARCS/RDHX, DLC
- **MPI:** HPE MPI, Cray MPI, Open MPI
- **PCIe cards:** Up to 4 LP PCIe cards
- **Power supplies:** 2, 3, or 4 power supplies to fit different power requirements
- **PDUs:** 15 metered, switchable, or higher amperage PDUs

HPE believes supercomputing for the enterprise will benefit organizations as they set out to evolve, whether they have deployments in operation or are just beginning to plan their ideal solution. That is why HPE offers supercomputing systems that are adaptable and future-ready, delivering revolutionary performance for whatever the future may bring. Our efforts will help enterprises turn “impossible” into what’s possible.

Conclusion

The rise of data coupled with ongoing advances in technology is perpetuating new ways of doing business and transforming what we know about life and work. Enterprises are hard at work to meeting the challenges set by data-heavy workloads and applications. The ability to evolve at exascale speed will continue to be pivotal to their success.

HPE is revolutionizing enterprise performance with the next generation of supercomputing systems. The latest addition to the HPE Cray portfolio, the HPE Cray XD2000 makes supercomputing more accessible than before with industry-leading tools that can power the diverse workflows of any industry.

Our supercomputing innovations are setting a new standard for compute. As we adapt exascale-class systems for the needs of the modern enterprise, we expect to see business breakthroughs and scientific discoveries that were once considered impossible.

The time to transform is now. Let HPE help you accelerate your innovation at exascale speed. Contact us today to learn how to get started.

Resources

hpe.com/us/en/hpe-cray-xd2000.html

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