

Government HPC for Artificial Intelligence and Data Analytics

Enhance public service with high performance computing, AI, data analytics on one system

Customer results

3X

computational power at TACC¹

70 petaFLOPS

of sustainable computing at ENI²

1K datapoints

streaming per second at McLaren³

Across local, state and federal government organizations, a number of different agencies – both military and civilian – are using advanced computing workloads like artificial intelligence (AI), data analytics, and modeling and simulation to transform their work. As high performance computing (HPC) systems have become smaller, simpler and less costly, governments are able to adopt HPC to provide the throughput and capacity needed to harness data to help them better serve and protect constituents.

Converging HPC with AI and data analytics on a single system gives you the horsepower to reduce administrative burdens, better manage public health and safety, improve military systems and more to serve citizens more efficiently while freeing up employees for more complex tasks.

However, to optimize budgets along with performance, it's critical to match advanced computing resources to requirements. System configuration can be a complex task, requiring a balance between workload requirements, performance targets, data center constraints and pricing. Many teams don't have the resources to research, optimize and deploy advanced computing systems to deliver the required outcomes.

With the Validated Design for Government HPC, AI and Data Analytics, Dell Technologies engineers have done the heavy lifting, so you can quickly deploy a solution that matches the needs of the organization. Dell Technologies can help you optimize investments based on your budget, with the ability to tune solutions for specific workloads and scale as needed with modular building blocks.

Essentially, the Validated Design can deliver the throughput and capacity to manage rapid data growth and increased workload demands, so agencies can maximize the benefits for taxpayers.

One System for AI, Data Analytics and HPC

Dell Technologies Validated Designs are workload-optimized rack-level systems with servers, software, networking, storage and services to scale faster with the confidence of an engineering-tested solution while saving valuable time and resources. The Validated Design for Government HPC, AI and Data Analytics has been optimized, tested and tuned for a variety of applications on the Kubernetes® stack, with ongoing testing and validation to expand the list of validated options. This solution runs HPC, AI and data analytics workloads on the same system, simplifying deployment and management, and keeping costs low.

¹ Compared to Lonestar5. Source: [TACC Lonestar6](#), October 2021.

² Dell Technologies case study, [Accelerating the path to sustainable energy](#), August 2020.

³ Dell Technologies case study, [Data-driven innovation starts at racing's edge to improve race car aerodynamics — and speed](#), April 2021.

Resources

- See the [Validated Design](#)
- See the [Validated Design with DKube](#)
- Performance testing and engineering documentation at hpcatdell.com

Learn more

- delltechnologies.com/hpc
- delltechnologies.com/ai
- delltechnologies.com/innovationlab
- delltechnologies.com/coe
- dellhpc.org

Flexible workload management enables dynamic movement of jobs between Slurm® and Kubernetes based on user demand, with a scalable shared filesystem to support both. Bright Cluster Manager® provides a single-pane-of-glass management experience for Dell hardware, Slurm and Kubernetes.

The Validated Design comes with a best practices guide and toolkit to help you take systems from factory-installed operating system to full Kubernetes cluster with a repository on GitHub®. With Bright Cluster Manager software, system administrators can quickly get clusters up and running and keep them running reliably throughout their lifecycle.

Components

Management node	Compute nodes	Accelerators	Networking	Storage
<ul style="list-style-type: none"> • PowerEdge R7525, R750, R6525, R650 	PowerEdge XE8545, R7525, R6525, C6525, R750xa, R7525, C6520, C6525	<ul style="list-style-type: none"> • NVIDIA A100, A10 or T4 • AMD Instinct™ Mi100 • Intel PAC FPGAs 	<ul style="list-style-type: none"> • PowerSwitch N3248TE-ON Ethernet • NVIDIA® QM8700 HDR100 InfiniBand® 	<ul style="list-style-type: none"> • PowerScale F800 • HPC NFS, BeeGFS® or PixStor Storage

Because the optimum solution configuration will depend on the specific mix of applications and types of data analytics, artificial intelligence and advanced computing workloads, recommended and engineering-validated configurations and options are provided, along with relevant criteria to consider when making these selections. As always, Dell Technologies HPC and AI experts are available to assist you with designing a solution for your specific needs. And Dell Technologies [Services](#) — ranging from consulting and education to deployment and support — are available when and where you need them. Dell Technologies also offers a broad range of financial options, including flexible consumption models to evolve with you over time.

