DELLTechnologies

AI and HPC for Government

Enhance public service and security
with artificial intelligence powered by
High Performance Computing systems

A HEALTHIER, SAFER FUTURE

Data is the key to enhancing the lives of citizens.

State, local and federal governments have long recognized that technology can be used to enhance the quality of life and the safety and security of citizens. In recent years, the focus has shifted to using more advanced computing solutions to leverage higher volumes of data, fueled by sensors, data digitization and increasing connectedness.
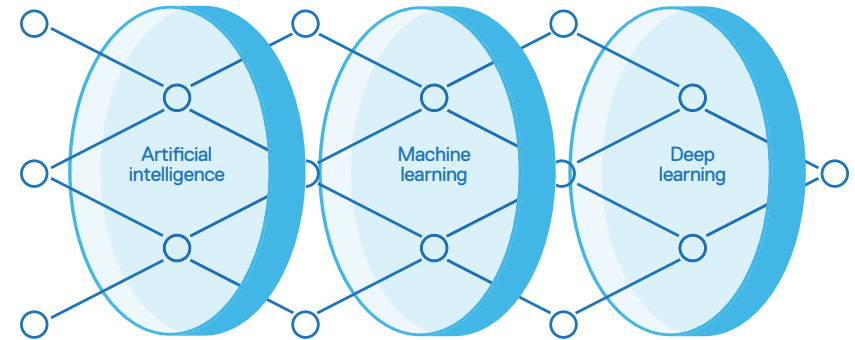
This data explosion has created an ideal environment for government agencies to use advanced computing technologies to add immeasurable value to the lives of citizens. High Performance Computing (HPC) is the technology that powers data analytics and artificial intelligence (AI) algorithms capable of filtering, associating, prioritizing, classifying and measuring massive amounts of data.

The convergence of HPC and AI will ultimately give government agencies the power to accelerate decision making and free public servants to focus on mission-critical, complex activities and decisions.

USE DATA MORE EFFECTIVELY FOR THE PUBLIC GOOD

AI is a complex set of technologies underpinned by machine learning (ML) and deep learning (DL) algorithms, typically run on powerful HPC systems. Together, they enable governments to harness data to help them better serve and protect constituents.

AI is an umbrella term that describes a machine's ability to act autonomously and/or interact in a human-like way.

ML refers to the ability of a machine to perform a programmed function with the data given to it, getting progressively better at the task over time as it analyzes more data and receives feedback from users or engineers.

DL uses artificial neural networks (ANNs), inspired by the human brain, to process huge volumes of data. ANNs allow the machine to determine on its own if a prediction is accurate so that it can train itself without human intervention.

The capabilities of AI, ML and DL can unleash predictive and prescriptive analytics on a massive scale. Like lenses, AI, ML and DL can be used in combination or alone — depending on the use case — to focus in on answers to governance challenges.

Government researchers and scientists can use AI, ML and DL to gain deeper, more accurate and more cost-effective insights that can help answer some of the greatest challenges of running states, municipalities and the federal government.

How AI and HPC are being used by governments

Advanced computing is changing how governments can approach tough challenges. The following is just a small sample of how state, local and national governments can leverage AI and HPC toward the public good.

1

Monitoring

Identify, assess and mitigate risks in real time
AI can be trained to identify and track high-risk individuals, assessing risk and sharing information across international organizations. Monitoring AI can transform public safety by turning cameras into smart sentinels with the ability to analyze live video from multiple sources, identify crimes and emergencies, and alert the appropriate authorities.

2

Cybersecurity

Automate and speed detection and reaction
AI can augment or even replace human efforts with the ability to autonomously protect networks, computers, software and data from unauthorized access. Cybersecurity systems equipped with AI can continuously analyze large volumes of data, recognize patterns of malicious behavior and respond quickly and automatically.

3

Emergency management

Speed and improve first response
AI can prioritize emergency calls based on factors such as caller sentiment analysis, location and outcomes from similar calls. AI can then map and prioritize emergency resources and provide critical information to responders. AI can also help predict, evaluate and simulate incidents to improve response times and streamline resource dispatch.

How AI and HPC are being used by governments

Advanced computing is changing how governments can approach tough challenges. The following is just a small sample of how state, local and national governments can leverage AI and HPC toward the public good.

4

Military and defense

Advance the state of military power and preparedness
AI can be embedded into weapons and monitoring systems to enhance performance. It can also be used to improve logistics and transportation, target recognition, battlefield healthcare, combat simulation and training, threat monitoring and situational awareness.

5

Weather modeling

Protect people and property
AI and HPC can be used to model the oceans, atmosphere, sea-ice, land surface, global carbon cycle and chemistry, and aerosols. The ability to more accurately simulate weather and climate changes, and predict the formation, intensity and movement of weather systems can help governments better protect people and property from impending weather events.

6

Public health

Predict and respond to health crises
HPC-enabled AI algorithms enable public health officials to monitor and identify patterns and trends in illnesses and predict emerging pandemics. AI models can be used to identify possible interventions and cures. AI can also be used to identify troubling health trends and provide ideas for interventions to improve overall public health and wellness.

PROVEN EXPERTISE

AI and HPC systems from an industry leader.

While AI and HPC might seem like the latest IT trends, Dell Technologies has been a leader for over a decade.

As an industry leader in AI and HPC, Dell Technologies offers proven products, solutions and expertise that reduce complexity and help you capitalize on the promise of using technology to advance the public good. Working closely with our partner ecosystem and industry providers, we deliver solutions inclusive of infrastructure, applications and services.

D&LLTechnologies

Dell Technologies

Dell Technologies helps organizations and individuals build their digital future and transform how they work, live and play. The company provides customers with the industry's broadest and most innovative technology and services portfolio for the data era. Together, we help you explore the possibilities of AI and HPC, introduce it into your organization, and use it for the greater good.

Dell Technologies is committed to a culture of integrating ethics and compliance into daily decision making. We believe in acting ethically in everything we do. It's good business and important to our customers, suppliers and strategic partners. As a result, critical programs have been developed to address key risks across the enterprise, creating trust with our customers.

DELIVERING VALUE

The AI value chain

Wherever you are on your journey, Dell Technologies delivers AI and HPC systems to fulfill your needs.

With an extensive portfolio, years of experience and an ecosystem of curated technology and service partners, Dell Technologies is ready to help you to capitalize on the promise of AI and HPC.
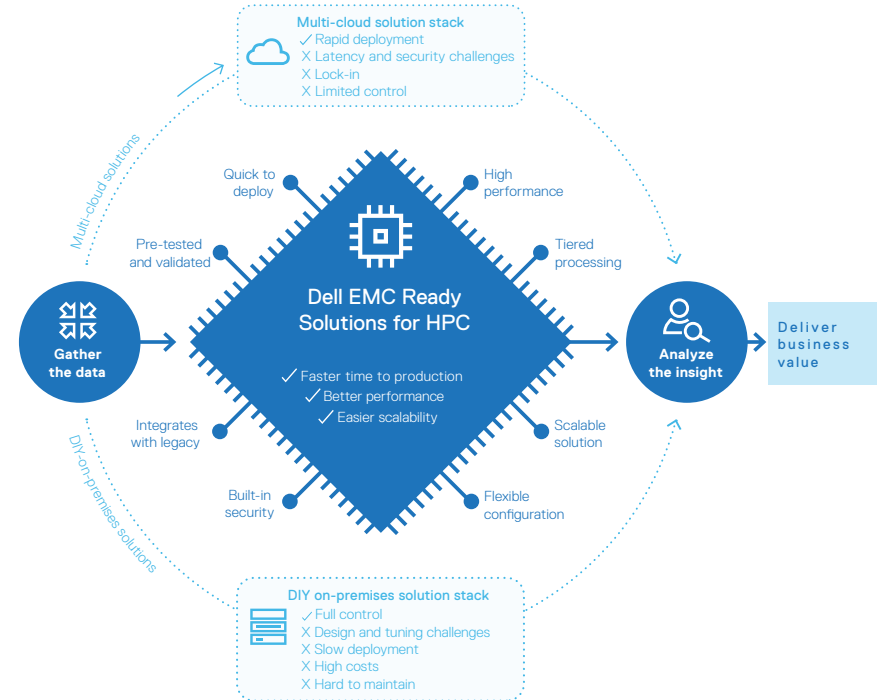
- **Extensive portfolio.** Dell Technologies uniquely provides a portfolio of technologies — spanning workstations, servers, networking, storage, software and services — to create successful AI and HPC implementations. What's more, Dell Technologies provides accelerated performance, efficiency and expertise to help you adapt as AI evolves.

- **Years of experience.** AI and HPC are evolving quickly and not many organizations have the skills to design, deploy and manage advanced computing systems. The Dell Technologies HPC & AI Innovation Lab team stays on the cutting edge of AI, testing new technologies and tuning algorithms and applications to help you keep pace with this constantly evolving landscape. Our team of industry and technology experts can help you achieve faster time to results by shortening both design cycle and configuration time. These experts will work with you to create a configuration with the right features, at the right price. You can even take a test drive with a proof of concept, or in one of the Customer Solution Centers.

- **Curated partnerships.** Dell Technologies works closely with partners, such as Intel®, AMD®, NVIDIA®, Mellanox® and Bright Computing® to optimize hardware to leverage advancements and to access their expertise around software algorithms.

SIMPLIFYING THE COMPLEX

Dell EMC Ready Solutions for HPC

Designing and deploying an HPC system for AI and other workloads with the performance and scalability required can be complex.

Dell Technologies has invested to create a portfolio of Ready Solutions, trusted designs that have been optimized, tuned and tested for a variety of key use cases. They include the servers, storage, networking, software and services that have been proven in our labs and in customer deployments. Plus, the modular building blocks provide a customizable yet validated approach for deploying new clusters or upgrading existing systems.

Multi-cloud solutions

Multi-cloud solution stack
✓ Rapid deployment
X Latency and security challenges
X Lock-in
X Limited control

Gather the data

Quick to deploy
High performance
Pre-tested and validated
Tiered processing

Dell EMC Ready Solutions for HPC
✓ Faster time to production
✓ Better performance
✓ Easier scalability

Integrates with legacy
Scalable solution
Built-in security
Flexible configuration

Analyze the insight

Deliver business value

DIY on-premises solutions

DIY on-premises solution stack
✓ Full control
X Design and tuning challenges
X Slow deployment
X High costs
X Hard to maintain

Dell EMC Ready Solutions for HPC

Ready Solutions for HPC simplify IT transformation, helping you solve challenges faster.

OPTIMIZE INVESTMENTS

- Purpose built HPC building blocks are tailored to speed deployment, help eliminate potential software and hardware issues, and optimize performance.
- Flexible, industry standard building blocks of compute, networking and storage are tested and tuned with your HPC and AI applications by Dell engineering teams.
- Available consulting, education, deployment, support and remote management services optimize solution productivity and efficiency.

SCALE EASILY

- A flexible building block approach easily scales over time.
- Scale by adding resources such as memory or hard drives inside Dell EMC PowerEdge servers
- Add external storage with Dell EMC PowerVault storage arrays, or Isilon scale-out network-attached storage (NAS).

REDUCE RISK

- Dell Technologies engineers and industry experts work in collaboration with you and our partners to design, deploy and scale HPC solutions for specific applications. This saves time and reduces the risk of potential hardware and software issues.
- Around the world, more than 34,000 Dell Technologiies Services experts are available every step of the way with consulting, education, deployment, management and support.[1]
- Dell Technologies is an industry leader in creating HPC solutions — regardless of size or complexity — that deliver fast setup with a wide range of optional services. With proven success in thousands of implementations worldwide, you can be confident growing with Dell Technologies.

Services and financing

Dell Technologies partners with you every step of the way, linking people, processes and technology to accelerate innovation and enable optimal outcomes.

- **Consulting services** are delivered by certified experts to help you get the business value of advanced computing. The services include an assessment, workshop, testing, proofs of concept and production implementation. These experts help determine where advanced computing is a good fit for your organization. They also help you build your own internal team of experts through knowledge transfer at each step.
- **Education Services** offers courses and certifications in data science and advanced analytics through self-paced online labs and instructor-led workshops.
- **Deployment** experts have the experience, expertise and best practices to enhance your success with data analytics, HPC and AI solutions. With a proven track record of success in thousands of engagements worldwide, you can rely on Dell as your partner.

- **Support** experts can provide comprehensive hardware and collaborative software support 24x7 for optimal system performance and minimized downtime. ProSupport includes next-business-day, on-site service with four- and eight-hour parts-and-labor response options, and escalation management with customer-defined severity levels. You can also opt for ProSupport Plus to get a technology service manager who serves as a single point of contact for your support needs.
- **Financial Services** offers a wealth of leasing and financing options to help you find opportunities when your organization faces decisions regarding capital expenditures, operating expenditures and cash flow.

GET IN TOUCH

Contact us

To learn more, visit **delltechnologies.com/hpc** or **contact** your local representative or authorized reseller.

Email: **Emergingtech@dell.com**

Online resources

delltechnologies.com/ai

delltechnologies.com/hpc

delltechnologies.com/government

delltechnologies.com/federal