DELLTechnologies

Dell Technologies
AI Solutions

Table of contents

Drive innovation with AI

In the drive to digital transformation and the rise of the data-driven organization, artificial intelligence (AI) has emerged as one of the most important technologies to help organizations innovate. AI is helping modern businesses save time and money while reducing risk by quickly identifying trends and patterns, improving IT management, and eliminating manual tasks.

Business leaders are recognizing the game changing potential, and competitive advantage, of AI. Organizations that fail to leverage AI today will fall behind their competitors tomorrow.

92% of businesses report that the pace of AI investment is accelerating[1]

49% of businesses are driving innovation with data[1]

77% of Fortune 500 CEO's plan to start or already employ AI initiatives[2]

The need to modernize, coupled with the massive amounts of data available, has fueled the adoption of AI as a business game changer.

AI is already making an impact

AI offers tremendous potential for specific industries. If implemented in the right way — it can help you optimize operations, improve overall productivity, and utilize manpower for more important tasks. Discover the possibility, power, and performance of AI computing from concept to reality in your market.

Healthcare and life sciencess	Healthcare and life sciences demands new computing paradigms to meet the need for personalized medicine, next-generation clinics, enhanced quality of care, and breakthroughs in biomedical research to treat disease. Now, healthcare institutions can harness the power of artificial intelligence and high-performance computing (HPC) to define the future of medicine.
Manufacturing	Harness AI and technology breakthroughs in engineering, simulation, production, remote collaboration, and visualization to revolutionize design, transform engineering, and power the factory of the future. From CAD to structural analysis to CFD, our software can fundamentally change the way you work.
Retail	From supply chains to stores—online and physical—AI helps retail run more efficiently and keeps employees and customers happier. Discover how retailers are using our solutions to power autonomous shopping, improve forecasting, automate warehouse logistics, and deliver better, more personalized customer experiences.
Public Sector	In one of the largest technology transformations ever undertaken, a revolution is happening right now amongst the government agencies and municipalities. AI is impacting new developments in cybersecurity, healthcare, life sciences, platform sustainment, humanitarian response, and disaster relief. We are at the forefront of this democratization of AI, building the technology that will make communities safer and more connected everywhere.
Financial	Intelligent technology can address critical challenges within the modern financial services industry. With our solutions—including deep learning, machine learning, and natural language processing—institutions can boost risk management, improve data-backed decisions and security, and enhance customer experiences.
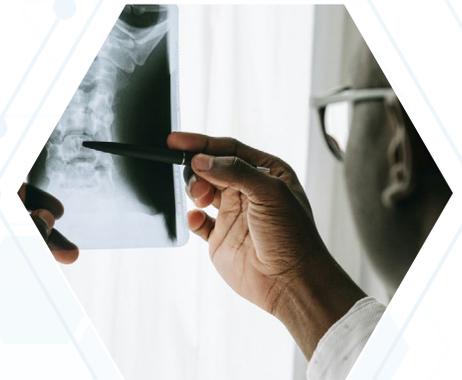
D&LL Technologies

The Dell Technologies point of view

While AI used to be regarded as the future of technological innovation, Dell Technologies now recognizes AI as the present. Organizations that wish to remain relevant and competitive must fully adopt and embrace the benefits of AI.

Recent Gartner research found that many organizations are essentially in an experimental phase with AI.[3] They know that AI holds great potential and that AI adoption is fundamental to the long-term success of the organization, but they struggle to integrate AI into many of their daily operations. Another recent study found that cultural challenges and a lack of skills are impeding the adoption of AI within many businesses.[4]

Businesses are looking for ways to handle the complexity of AI, even though they are challenged by the lack of in-house expertise. For these organizations, there is a solution developed in partnership between three companies that are each dominant in their respective fields:

> **Dell Technologies**, industry leader in simplifying IT environments

> **VMware**, industry leader in software server virtualization

> **NVIDIA**, a full-stack computing company, developing CPUs, DPUs, GPUs, and AI software that fuel data center-scale computing solutions

78%

of AI/machine learning projects stall before deployment — one-third of them at the proof-of-concept stage.[5]

3. "Gartner Forecasts Worldwide Artificial Intelligence Software Market to Reach $62 Billion in 2022," Gartner, November 22, 2021

4. "As Company Culture Warms to AI Adoption, Lack of Skills and Difficulty Hiring Still Present Significant Barriers to Entry, According to New O'Reilly Research," Business Wire, April 19, 2021

5. "Almost 80% of AI and ML Projects Have Stalled, Survey Says," Robotics Business Review, May 2019.

DELLTechnologies

Overcoming the challenges of AI adoption

Several key challenges regarding the implementation of an AI solution can cause a business's digital transformation to lose momentum. Identification and remediation are key to a successful AI strategy.

Together, Dell Technologies, VMware, and NVIDIA deliver simplified and high performance AI-ready solutions backed by partners with deep AI expertise.

Complexity
The implementation of an AI solution can take weeks to months to architect and implement depending on the sophistication, scope and technical depth of the solution. And, once assembled, ongoing maintenance of the environment can be a complex and time-consuming task.

Speed
Increased data acquisition to support business insights requires the adoption of new AI solutions. As these solutions evolve, organizations are challenged to keep pace and ensure alignment with business strategy.

Lack of expertise
78% of AI/ML projects stall before deployment — one-third of them at the PoC stage due to lack of effective resources or dedicated technical experts to help facilitate an AI implementation.[6]

Simplified AI
Jointly engineered and validated solutions make it quick and easy to deploy a hardware and software stack optimized to accelerate AI initiatives.

High Performance
High performance improves AI model training accuracy with fast access to larger data sets, enabling live inferencing at scale to drive real-time, actionable responses.

AI expertise
Deploying an engineering-tested validated AI solution backed by world-class services and support helps you confidently plan, implement and optimize AI solutions anywhere you are in your journey.

Dell Technologies Validated Designs for AI enable **18-20% faster configuration and integration**, saving 12 employee hours a week with automated reconciliation feeds.

Dell Technologies Validated Designs for AI enable **18X faster AI models**—two to three days instead of one to two months.

Customers can **deploy with confidence** knowing that mission-critical AI projects will stay on track with world class support.

6. Alegion White paper: What Data Scientists Tell Us About AI Model Training Today
7. Robotics Business Review, Almost 80% of AI and ML Projects Have Stalled, Survey Says, May 2019.

Easy for IT

Run AI workloads alongside existing applications.

Many organizations already use VMware vSphere for server virtualization and NVIDIA GPUs for workload acceleration. However, as data grows, data centers are starting to hit performance and scale limitations — especially when it comes to AI.

Building separate systems for AI workloads — with different hardware, software and toolsets — leads to management complexity, poor utilization rates and lengthy provisioning times. Data scientists might have to wait weeks or even months for IT to provision the resources required for AI development.

Dell Validated Designs for AI are jointly engineered and validated to power AI workloads alongside existing applications in VMware-virtualized data centers with near-bare-metal performance.

Disaggregating resources at a more granular level optimizes hardware investments — including server GPUs — increasing utilization and creating an incredibly flexible compute foundation for AI, all on infrastructure that is easy for IT to deploy and manage.

These solutions offer:

AI simplified
Jointly engineered and validated solutions make it quick and easy to deploy optimized hardware-software stacks.

Faster AI insights
Automated ML and streamlined operations delivered with the AI tools and frameworks in an optimized infrastructure enable faster time to production for development and for IT teams.

Proven AI expertise
Condifently deploy an engineering-tested AI solution backed by world-class Dell Technologies services and support. Select ProSupport Plus for a single point of contact for software and hardware support.

DELLTechnologies

Validated design for AI in virtualized environments

Configurations are based on Dell Technologies NVIDIA-Certified Systems™ with NVIDIA AI Enterprise Suite, VMware vSphere virtualization with Tanzu containers.

Compute

4x Dell VxRail HCI V670

or

4x Dell PowerEdge R750xa

with

NVIDIA A100 or A30 GPUs

Networking

Dell PowerSwitch 25GbE S5248F-ON

or

an out-of-band PowerSwitch S4148T-ON

Storage

PowerScale F600

or

H600

Software

H2O.ai Driverless AI cnvrg.io MLOps

NVIDIA AI Enterprise

VMware vSphere with Tanzu

Learn more about the Dell Validated Design for AI in Virtualizated Environments >>

NVIDIA technologies are built in

The VxRail hyperconverged infrastructure (HCI) or PowerEdge servers at the heart of your solution come with integrated NVIDIA technologies that help speed ML workloads — and results.

vGPUs

NVIDIA virtual GPUs (vGPUs)
NVIDIA vGPU software enables sharing GPU resources across multiple virtual machines to make them accessible to any device, anywhere.

MIGs

NVIDIA multi-instance GPUs (MIGs)
NVIDIA MIGs expand the performance and value of GPUs by partitioning them into as many as seven instances to support every workload and extend accelerated resources to more users.

A100

NVIDIA A100 GPUs
Accelerate AI workloads with up to 20X higher performance over the prior generation.[8] The A100 supports NVLink bridge, the world's first high-speed GPU interconnect offering a significantly faster alternative for multi-GPU systems than traditional PCIe-based solutions.[9]

8. NVIDIA website, Accelerating the Most Important Work of Our Time, accessed June 2022.
9. NVIDIA website, NVIDIA NVLink™, accessed June 2022.

NVIDIA technologies are built in

The VxRail hyperconverged infrastructure (HCI) or PowerEdge servers at the heart of your solution come with integrated NVIDIA technologies that help speed ML workloads — and results.

AI

NVIDIA AI Enterprise
NVIDIA AI Enterprise is an end-to-end, cloud-native suite of AI and data science tools and frameworks optimized and exclusively certified by NVIDIA to run on VMware vSphere with NVIDIA-Certified Systems. It includes key technologies for the rapid deployment, management and scaling of AI workloads.

NVIDIA CERTIFIED

NVIDIA-Certified Systems
As NVIDIA-Certified Systems, VxRail HCI and PowerEdge bring together NVIDIA GPUs, NVIDIA ConnectX® smart network interface cards (SmartNICs) and NVIDIA BlueField DPUs in optimized configurations. These are validated for performance, manageability, security and scalability and are backed by enterprise-grade support from NVIDIA and Dell Technologies.

Power your AI journey with PowerScale

Dell PowerScale delivers high-performance machine learning and deep learning

All-Flash Performance

Eliminate the I/O bottleneck up to 18x more bandwidth; up to 15GB/s per chassis, up to 540 GB/s per cluster

Flexibility

Bring analytics to the data with in-place analytics leveraging multi-protocol support and direct access to the Snowflake platform

Extreme Scale-Out

Scaling to 21x* more capacity than the competition with industry leading storage efficiency up to 80%

Enterprise Features

Advanced data management tools including ransomware protection

Eliminate I/O bottlenecks with Powerscale

Accelerate Innovation
Up to 2.7x* faster performance to accelerate model training cycles

Increase Model Accuracy
Deeper higher resolution data sets with access to 10s TBs up to 10s PBs per cluster

Improve Data Science Productivity
Flexible in-place analytics and pre-validated solutions for faster, low-risk deployments

Flexible Deployments
Start small and independently scale-out compute and storage for large scale deployments

*Compared to competition

D∕ELL Technologies

Accelerate GPU applications with RDMA data access on PowerScale

GPU

Fast low latency data transfer
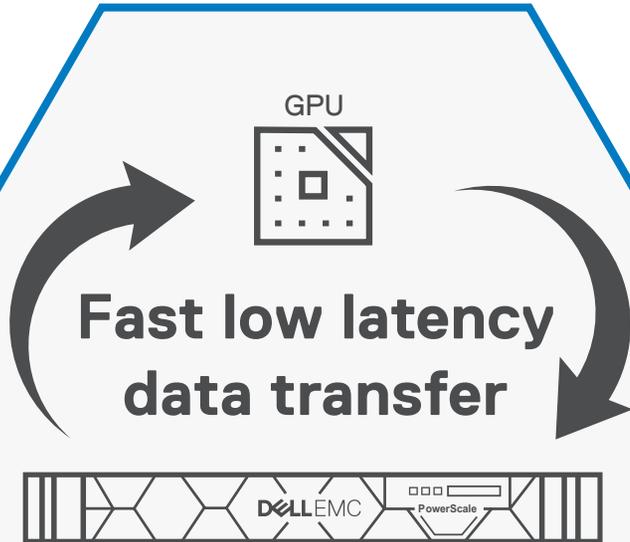
New NFS over RDMA for faster, secure and low latency data access

Lower latency and lower CPU utilization on both client and storage

Compatible with NVIDIA GPUDirect Storage protocol

∕⃝ NVIDIA
Linear scaling

252 GB/s

169 GB/s

85 GB/s

6 GB/s
1 node
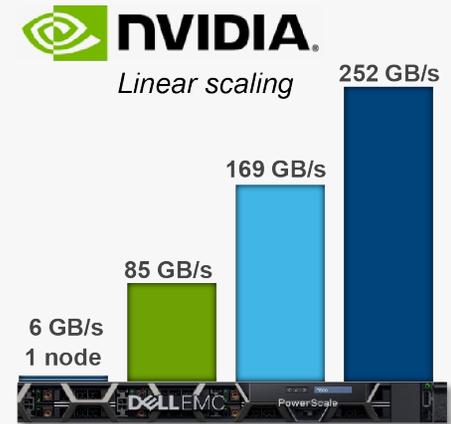
Linear performance scaling up to 252 scale-out NAS nodes on PowerScale

DELLTechnologies

PowerScale deployment options for AI

From edge to core to cloud

AI SANDBOX

Storage starter bundle
for Data science
workstation

SCALE OUT

Validated designs and reference
architectures of appliances for
large scale workloads

AI ON CLOUD

Support for distributed multi-cloud
AI/ML workflows including direct
access to the Snowflake platform.

DELL Technologies

Learn more

Visit: Dell.com/AI

Contact: ai.assist@dell.com

Get a feel for enterprise AI on Dell
NVIDIA LaunchPad is a free program
that provides short-term access to a
large catalog of hands-on labs so you can
experience end-to-end solution workflows
in the areas of AI, data science, 3D design
collaboration and simulation, and more.

Try It Now