

# Dell EMC Ready Solutions for AI, Machine and Deep Learning

Providing the expertise required to accelerate the evolution of human progress in the age of artificial intelligence

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## Faster, better and deeper insights

## Enhanced efficiency and security

## Trusted expertise

# 69.2% of CFOs

surveyed say artificial intelligence and machine learning are “critically important” or “very important” to the business<sup>1</sup>

# 75%

of enterprise and independent software vendor (ISV) development will include AI or machine learning in at least one application<sup>2</sup>

## The future of artificial intelligence is now

Artificial intelligence (AI) and its supporting computing models — machine and deep learning — are decades-old technologies that are just now beginning to take off. Why is AI so hot right now? The reason is likely a convergence of multiple forces. First, the industry is making incredible breakthroughs in AI, especially in deep learning. Second, the mainstreaming of high-performance computing (HPC) is making advanced computing power available and affordable for a much wider range of companies. And third, there is a lot more data available to fuel AI — with more being produced every second.

This perfect storm is creating an opportunity for you to quickly identify trends and patterns that otherwise would be difficult and time-consuming to detect. Whatever your industry vertical, machine and deep learning can change everything. Whether you're just getting started, or whether you've been doing AI, machine learning or deep learning for some time, Dell EMC can help you capitalize on the latest technological advances, saving you time and money while reducing risk.

## Pushing the boundaries of AI, machine and deep learning

Dell EMC is at the forefront of AI, providing the technology that makes tomorrow possible, today. Dell EMC uniquely provides an extensive portfolio of technologies — spanning workstations, servers, networking, storage, software and services — to create the high-performance computing (HPC) and data analytics solutions that underpin successful AI, machine and deep learning implementations. What's more, Dell EMC has invested to create a portfolio of Ready Solutions designed to provide faster, better and deeper insights, delivered with efficiency and security. You can rely on the Dell EMC team of experts to help you adapt as AI, machine and deep learning evolve over time.

### Faster, better and deeper insights

Data scientists, developers and researchers are using machine learning to gain insights previously out of reach. Programs that learn from experience are helping them discover how the human genome works, understand consumer behavior to a degree never before possible, and build systems for purchase recommendations, image recognition and fraud prevention, among other uses. Dell EMC machine and deep learning solutions empower you to identify patterns, analyze vast amounts of data and automate tasks so you can get insights faster, better and deeper.

### Enhanced efficiency and security

While it's a multi-cloud world, the data-intensive workloads associated with machine and deep learning are not always best suited to running in the cloud. By making on-premises solutions obtainable for enterprises of all sizes, Dell EMC Ready Solutions for Machine and Deep Learning can help optimize the efficiency and security in AI, machine and deep learning environments both on- and off-premises.

### Trusted expertise

The Dell EMC HPC Innovation Lab team of engineers continually tests new technologies and works collaboratively to tune solutions for industry-leading applications. In addition to world-class engineers, the HPC Innovation Lab has a TOP500 supercomputer and extensive industry partnerships, bringing together a community of the brightest minds focused on using AI, machine and deep learning. The knowledge and experience of Dell EMC and its strong ecosystem of technology partners can help you get started with machine and deep learning solutions quickly.

<sup>1</sup> CNBC.com, "[One quarter of CFO Council members say A.I. is 'critical' to their companies](#)," June 2017.

<sup>2</sup> IDC FutureScape presentation, "[Worldwide Analytics, Cognitive/AI and Big Data 2017 Predictions](#)," December 2016.

“The HPC Innovation Lab gives our customers access to cutting-edge technology, like the latest-generation Dell EMC products, Scalable System Framework from Intel, InfiniBand gear from Mellanox, NVIDIA GPUs, Bright Computing software and more. Customers can bring us their workloads, and we can help them tune a solution before the technology is readily available.”

—Garima Kochhar, Systems  
Sr. Principal Engineer

[Learn more about the Dell EMC HPC Innovation Lab.](#)

## Are you facing any of these challenges?

“We haven’t been able to take full advantage of our data.”

Data is growing at an astronomical rate and it’s impossible to take full advantage of it manually to get insights to win. Automation can help provide faster, better and deeper data insights. Dell EMC Ready Solutions for AI, Machine and Deep Learning can provide the processing power required for the vast number of calculations that need to be made very quickly — for facial recognition, for example. With the speed of automated image and pattern detection, these solutions can help provide better data insights. And with historical data sets, you can get deeper insights into, for example, buying behavior.

“We can’t afford to run machine and deep learning in the cloud.”

Some public cloud providers charge to get data out, and that can get expensive quickly with the large datasets required for deeper insights such as image recognition and fraud detection. Dell EMC Ready Solutions for AI, Machine and Deep Learning can reduce costs associated with moving significant amounts of data in and out of the cloud while minimizing risks.

“We don’t have the in-house expertise.”

AI and related computing paradigms are emerging quickly and not many organizations have had the time or resources to develop the skills required to design, deploy and manage advanced machine and deep learning solutions. The Dell EMC HPC Innovation Lab team stays on the cutting edge of AI, testing new technologies, and tuning algorithms and applications to help you keep pace with the constantly evolving landscape. This team of industry and technology experts can help you achieve faster time to results by shortening both design cycle and configuration time. These experts can work with you to create a solution with the right features, at the right price. You can even take a test drive with the HPC Innovation Lab with a proof of concept, in one of the Customer Solution Centers, or in one of Dell EMC’s worldwide HPC Innovation Centers.

“One of the things that’s really exciting about deep learning is that it’s taking a lot of problems that used to be very specialized and . . . transferring [them] into an engineering problem, so that people even without a lot of domain expertise are able to solve hard problems in many different domains. And, because of this...deep learning is going to be applied very widely in a lot of surprising places.”

—Bryan Catanzaro, Ph.D.,  
Vice President, Applied Deep  
Learning Research at NVIDIA

[See more.](#)

“‘Buoyed by Moore’s Law and fed by a deluge of data, AI is at the heart of much of today’s technical innovation.’ With use cases and solutions led by artificial intelligence spanning across agriculture, sports, financial institutions, autonomous cars, healthcare, education and more, the race to tap the burgeoning market is set to become more competitive. With its focus on AI, Intel is preparing to stay ahead of its competitors with technological innovation.”<sup>3</sup>

## Understanding artificial intelligence, machine and deep learning

These three concepts are closely intertwined. The umbrella term, AI, refers to machine intelligence, while machine and deep learning are the technologies that underpin AI and make it possible.

Machine learning refers to the process of “training” the machine, feeding large amounts of data into algorithms that give it the ability to learn how to perform the task. Deep learning makes coding more efficient by combining components (such as convolution and pooling) and heuristics (such as dropout and batch normalization) to enhance generalization performance.

From a computational perspective, it’s the deep learning part of AI that requires more compute acceleration, memory and higher bandwidth input/output (I/O). This is also an area where specialized accelerators have a better advantage and are more suited to solving these neural net models.

Dell EMC is making machine and deep learning possible in a more meaningful way — with more powerful processors and faster computing capability — to make this technology achievable for businesses in a wide range of industries.

[Read more about the difference between AI, machine and deep learning.](#)

### Machine and deep learning use cases

Healthcare and life sciences	Financial services	Government security and defense	Media and entertainment
<ul style="list-style-type: none"> <li>• Drug interaction</li> <li>• Cancer detection</li> <li>• Chronic illness prediction</li> <li>• Drug discovery</li> <li>• Gene mutation</li> <li>• Sanitation</li> </ul>	<ul style="list-style-type: none"> <li>• Fraud prevention</li> <li>• Risk management</li> <li>• Investment predictions</li> <li>• Customer service</li> <li>• Digital assistants</li> <li>• Network security</li> </ul>	<ul style="list-style-type: none"> <li>• Facial recognition</li> <li>• Video surveillance</li> <li>• Cyber security</li> <li>• Satellite imagery</li> <li>• Event prediction</li> <li>• Emergency service</li> </ul>	<ul style="list-style-type: none"> <li>• Video captioning</li> <li>• Content-based search</li> <li>• Real-time translation</li> <li>• Language processing</li> <li>• Content suggestions based on selections over time</li> </ul>

Manufacturing	Energy	Transportation	Retail
<ul style="list-style-type: none"> <li>• Smart manufacturing systems</li> <li>• Factory and demand analytics and optimization</li> <li>• Preventative maintenance</li> <li>• Relationship intelligence</li> <li>• Product and service quality</li> </ul>	<ul style="list-style-type: none"> <li>• Wind power generation</li> <li>• Solar forecasts</li> <li>• Oil production optimization</li> <li>• Weather prediction</li> <li>• Prediction of consumption demand</li> </ul>	<ul style="list-style-type: none"> <li>• Autonomous vehicles</li> <li>• Pedestrian and object detection</li> <li>• Lane tracking and traffic patterns</li> <li>• Preventative maintenance</li> <li>• Risk assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Supply and demand planning</li> <li>• Predicting buying behavior</li> <li>• Loss prevention</li> <li>• Upsell, cross-sell opportunities</li> <li>• Customer and product movement tracking</li> </ul>

<sup>3</sup> Nasdaq.com, “[Intel’s Future Lies with Artificial Intelligence](#),” June 2017.



## Dell EMC Ready Solutions for Machine and Deep Learning

Dell EMC engineers can work with you to create solutions that can dramatically accelerate results in AI, machine and deep learning environments. Our machine and deep learning solutions are based on a scalable building-block approach, so the solutions you buy today can grow to meet your needs in the future.



### Dell EMC Machine Learning Ready Bundle with Hadoop

Validated solution for image recognition

The Dell EMC Machine Learning Ready Bundle with Hadoop builds on the power of tested and proven Dell EMC Ready Bundles for Hadoop, created in partnership with Cloudera® and Hortonworks®. The solution includes an optimized solution stack along with data science and framework optimization, so you can get up and running quickly.

If you're running Apache® Spark®, you can take advantage of the BigDL distributed deep learning library for Apache Spark, for a faster path to enabling machine learning and to making deep learning more accessible for non-expert big data users and data scientists. BigDL integrates into the Apache Hadoop® frameworks and tools, enabling deep learning on the same Hadoop/Spark cluster where data is stored.

The solution also leverages DataRobot®, an advanced enterprise automated machine learning solution that encapsulates the knowledge, experience and best practices of the world's leading data scientists, enabling you to quickly and easily build highly accurate predictive models without previous coding and machine learning skills.

- Simplify the design, architecture, deployment and configuration of a Hadoop environment with machine learning.
- Gain business insights to build unique competitive advantages.
- Vastly reduce the time, effort, and resources spent on trying to build, architect and maintain a machine learning solution.
- Leverage Dell EMC Services to help bridge the gap between data science, IT and lines of business.



### Dell EMC Deep Learning Ready Bundle with Intel

Validated solution for image recognition and fraud detection with an easy-to-use toolset

The Dell EMC Deep Learning Ready Bundle with Intel simplifies and accelerates the adoption of deep learning technology with an optimized solution stack that simplifies the entire workflow from model building to training to inferencing. The Dell EMC Deep Learning Ready Bundle with Intel includes the hardware, software and services you need to get up and running with a solution quickly.

- Get an optimized solution from the server to software stack—including software development and data science.
- Simplify and accelerate adoption of AI with easy-to-use toolsets.
- Leverage Dell EMC Services to bridge the gap between the data science, IT and lines of business.



## Dell EMC Deep Learning Ready Bundle with NVIDIA

**Validated solution for image recognition and fraud detection with blazing performance**

The Dell EMC Deep Learning Ready Bundle with NVIDIA provides a GPU-optimized solution stack that can shave valuable time from deep learning projects. Dell EMC engineers can help you configure, test and tune GPU-enabled hardware and software, with included services to help data scientists load and discover insight from data more quickly.

The Dell EMC Deep Learning Ready Bundle with NVIDIA is built around NVIDIA® Tesla® V100 GPUs. With 640 tensor cores, this powerful accelerator was the first to break the 100 teraFLOPS barrier for deep learning performance.<sup>4</sup> NVIDIA NVLink™ connects multiple V100 GPUs at up to 300 GB/s to deliver 30X higher inference performance than CPU-based servers. This level of throughput and efficiency makes scaling-out machine and deep learning services much more feasible.

- Get expert guidance on configuring and optimizing the solution stack based on use case — from server to software, networking to storage.
- Train AI models that used to require weeks of computing resources in just a few days.
- Scale AI resources more easily and bridge the gap between the data science, IT and lines of business.

## Dell EMC Machine and Deep Learning Reference Configurations

**Validated solutions for training and inferencing**

Dell EMC has partnered with Bright Computing® to offer the software stack on Dell EMC hardware in a portfolio of reference configurations for multiple use cases. The Dell EMC HPC team has in-depth experience working closely with Bright Cluster Manager® to create solutions from our portfolio of servers, storage, networking, software and services. That expertise is then multiplied through collaboration with Customer Solution Centers, worldwide HPC Innovation Centers, the HPC Innovation Lab and the broader data analytics community. These experts can work with you to create a solution with the right features, at the right price.

- Meet the performance needs of your applications with accelerator-enabled solutions.
- Leverage industry and technology experts who can help you achieve faster time to results by shortening both the solution design cycle and configuration time.
- Grow to meet future needs with solutions based on a scalable building-block approach.

<sup>4</sup>80Level, [NVIDIA Tesla V100: The Best Processor for AI Research](#), May 2017.

## Dell EMC Machine and Deep Learning Ready Bundles technical specifications

The following solutions can be customized and tuned for your customers' specific workload needs.

Configuration	Dell EMC Machine Learning Ready Bundle with Hadoop	Dell EMC Deep Learning Ready Bundle with Intel	Dell EMC Deep Learning Ready Bundle with NVIDIA
Software	Cloudera Enterprise Data Hub, DataRobot, Spark, Cloudera Data Science Workbench	Intel Nervana Deep Learning Studio	Bright Cluster Manager
Frameworks/libraries	<ul style="list-style-type: none"> <li>• Caffe</li> <li>• TensorFlow</li> <li>• BigDL</li> </ul>	<ul style="list-style-type: none"> <li>• Caffe</li> <li>• TensorFlow</li> <li>• Intel Neon</li> <li>• Intel Math Kernel Library for Deep Neural Networks (MKL-DNN)</li> <li>• Intel Machine Learning Scaling Library (MLSL)</li> </ul>	<ul style="list-style-type: none"> <li>• Caffe</li> <li>• TensorFlow</li> <li>• NVIDIA CUDA® Deep Neural Network Library (cuDNN)</li> <li>• NVIDIA CUDA basic linear algebra subroutines (cuBLAS)</li> <li>• NVIDIA Collective Communications Library (NCCL)</li> </ul>
Configuration, optimization, benchmarking and data science	Deployment, hardware, software, API, models	Deployment, hardware, software, API, models	Benchmarking, server configuration and network guidance
Model libraries	N/A	Jumpstart models and data sets	N/A

## Dell EMC Machine and Deep Learning Reference Configurations technical specifications

Dell EMC PowerEdge servers support powerful accelerators at a single-node and multi-node level, to align with deep learning applications.

Configuration	Deep Learning Single Node "Training"	Deep Learning Single Node "Training and Inferencing"	Deep Learning Medium "K"	Deep Learning Large "K"
Compute	PowerEdge R740 Server or PowerEdge T640 Server	PowerEdge R740 Server	PowerEdge C4140 Server	PowerEdge C4140 Server
Processor	2 x Intel Xeon® Gold Scalable 6150 processor	2 x Intel Xeon Gold Scalable 6150 processor	2 x Intel Xeon Gold Scalable 6148 processor	2 x Intel Xeon Gold Scalable 6148 processor
Memory	384GB DDR4 @ 2,667 MHz	384GB DDR4 @ 2,667 MHz	384GB DDR4 @ 2,667 MHz	384GB DDR4 @ 2,667 MHz
Drives	PowerEdge R740: 1TB SSD PowerEdge T640: 1TB SSD	1TB SSD	2 x SSDR, 120G, SATA, M.2, IN, BOSS	2 x SSDR, 120G, SATA, M.2, IN, BOSS
Networking	N/A	N/A	N/A	Mellanox® InfiniBand® EDR 100Gb/s with ConnectX®-4 VPI adapter card
Accelerator	PowerEdge R740: 3 x NVIDIA Tesla V100 PCIe PowerEdge T640: 4 x NVIDIA Tesla V100 PCIe	3 x NVIDIA Tesla P40 PCIe	4 x NVIDIA Tesla P100 SXM2 or 4 x NVIDIA Tesla V100 SXM2	4 x NVIDIA Tesla P100 SXM2 or 4 x NVIDIA Tesla V100 SXM2
TOR (Top of Rack) switch	N/A	N/A	N/A	SwitchIB™2 based EDR InfiniBand 1U Switch, 36 QSFP28 ports, 2 Power Supplies, (AC), x86 dual core, standard depth
External storage	N/A	N/A	N/A	MD1280 with NFS
Head node	N/A	N/A	N/A	PowerEdge R740xd Server
Software	Bright Cluster Manager	Bright Cluster Manager	Bright Cluster Manager	Bright Cluster Manager

## Solution components

- [Dell EMC PowerEdge R640 Server](#) offers the ideal balance of density and scalability in a 1U, 2-socket solution that's built on a scalable system architecture and provides the choice and flexibility to easily meet performance demands.
- [Dell EMC PowerEdge T640 Server](#) is powerful, versatile and scalable, with peak 2-socket performance and huge internal storage capacity. Accelerate demanding workloads and plan for future growth with cost-effective, in-server expansion.
- [Dell EMC PowerEdge R740 Server](#) accelerates application performance with the optimum balance of accelerator cards, storage and compute resources in a 2U, 2-socket server.
- [Dell EMC PowerEdge R740xd Server](#) provides scalable storage performance and data set processing in a 2U, 2-socket server with the scalability and performance to adapt to a variety of applications.
- [Dell EMC PowerEdge C6320p Server](#) is a balanced, high-performance server, optimized for highly parallel code in a dense 4-node/2U solution, and ideal for workloads like financial risk analysis, deep learning and big data analytics.
- [Dell EMC PowerEdge C4140 Server](#) drives demanding HPC, data visualization and rendering workloads with a flexible, dense 1U rack server optimized for GPUs and co-processors.
- [NVIDIA Tesla V100 GPU accelerators](#) offer the performance of 100 CPUs in a single GPU—enabling data scientists, researchers, and engineers to tackle challenges that were once impossible.
- [NVIDIA Tesla P100 GPU accelerators](#) deliver a unified solution for accelerating AI, with higher performance and fewer, lightning-fast nodes, to dramatically increase throughput while also saving money.
- [NVIDIA Tesla P40 GPU accelerator](#) is the first accelerator to combine an enterprise-grade visual computing solution for simulation, HPC rendering, and design with virtual applications, desktops, and workstations.
- [Dell EMC Networking S4048-ON 10/40GbE switch](#) is a top-of-rack, high-density 1U switch with forty-eight 10 GbE uplinks. It offers ultra-low-latency and line rate performance designed for data centers.
- [Dell EMC S3124 iDRAC switch](#) features low latency and superb performance designed for reliable server aggregation and cost-effective deployment.
- [Dell EMC Networking S6000 40GbE cluster switches](#) are the industry's first disaggregated hardware + software data center networking solution that empowers organizations to deploy modern workloads and applications designed for the open networking era.
- [Mellanox InfiniBand](#) enhances server performance to provide the bandwidth and speed needed for performance-driven server and storage applications.
- [Dell EMC H-Series Edge Switches](#) based on Intel Omni-Path Architecture deliver the performance for tomorrow's HPC workloads and the ability to scale to tens of thousands of nodes—and eventually more—at a price competitive with today's fabrics.
- [Dell EMC Ready Bundle for HPC NFS Storage](#) is reliable, easy to administer and has very good performance. In clusters with higher I/O requirements, NFS is a good option for a secondary storage repository for home directories, application storage and longer-term storage of application data.
- [Dell EMC Ready Bundle for HPC Lustre Storage](#) allows scaling efficiently both up and down to suit workload needs without losing performance or capacity, to tap into the power and scalability of Lustre® with simplified installation, configuration and management features — on cost-optimized industry-standard Dell EMC solutions.



[Bright Cluster Manager for HPC](#) lets you deploy clusters over bare metal with a management view that spans the hardware, the operating system, the software and users.

[Cloudera Enterprise Data Hub](#) is one software package with many applications that range from data science and engineering, to powering an operational database, to running large-scale analytics.

[Cloudera Data Science Workbench](#) enables fast, easy, and secure self-service data science for the enterprise.

[Apache Spark](#) is an open source cluster computing framework, a fast and general engine for large-scale data processing.

[DataRobot](#) offers an automated machine learning solution, as well as services and education to jumpstart the transformation to an AI-driven enterprise.

### Frameworks and libraries

- **BigDL** is a distributed deep learning library for Apache Spark that can run directly on top of existing Spark or Hadoop clusters. BigDL can be used to write deep learning applications as Scala or Python programs.
- **Caffe** is a deep learning framework made with expression, speed and modularity in mind. Caffe is developed by the Berkeley Vision and Learning Center (BVLC), as well as community contributors and is popular for computer vision.
- **Intel MKL-DNN** is an open source performance library for acceleration of deep learning frameworks on Intel architecture. It includes highly vectorized and threaded building blocks for implementation of convolutional neural networks with C and C++ interfaces.
- **Intel MLSL** is a library providing an efficient implementation of communication patterns used in deep learning. It is optimized to drive scalability of communication patterns.
- **Intel Neon** is a deep learning framework based on Python and optimized for Intel architecture. It is designed for ease of use and extensibility on modern deep neural networks, such as AlexNet, Visual Geometry Group (VGG), and GoogLeNet.
- **NVIDIA cuBLAS** library is a GPU-accelerated implementation of the standard BLAS. Using cuBLAS APIs can speed up applications by deploying compute-intensive operations to a single GPU or scale up and distribute work across multi-GPU configurations efficiently.
- **NVIDIA cuDNN** is a GPU-accelerated library of primitives for deep neural networks. cuDNN provides highly tuned implementations for standard routines such as forward and backward convolution, pooling, normalization and activation layers.
- **NVIDIA NCCL** implements multi-GPU and multi-node collective communication primitives that are performance optimized for NVIDIA GPUs. NCCL provides routines that are optimized to achieve high bandwidth over PCIe and NVLink high-speed interconnect.
- **TensorFlow** is a software library for numerical computation using data flow graphs, developed by Google's Machine Intelligence research organization.

## Why Dell EMC?

The combination of Dell and EMC brings together two industry-leading companies with strong reputations for value and innovation. Dell EMC holds leadership positions in some of the biggest and largest-growth categories in the IT infrastructure business, and that means you can confidently source your IT needs from one provider — Dell EMC.

- #1 in HPC server units<sup>5</sup>
- #1 in both number and size of XSEDE HPC systems for U.S. open science<sup>6</sup>
- #1 fastest supercomputer on the African continent<sup>7</sup>
- #1 converged infrastructure<sup>8</sup>
- #1 in traditional and all-flash storage<sup>9</sup>
- #1 cloud IT infrastructure<sup>10</sup>
- #1 in data protection<sup>11</sup>
- #1 in software-defined storage developed by Google's Machine Intelligence research organization<sup>12</sup>

<sup>5</sup> IDC, "[WW Quarterly Server Tracker](#)," September 2017.

<sup>6</sup> Dell EMC has the most systems in XSEDE, including the largest system. Systems include SDSC Comet, SDSC, TACC Jetstream, TACC Stampede, LSU SuperMIC and TACC Wrangler. TACC Stampede is the largest system in XSEDE. See "[XSEDE High Performance Computing](#)."

<sup>7</sup> The Next Platform, "[South African Lengau System Leaps Towards Petaflops](#)," June 2016.

<sup>8</sup> IDC WW Quarterly Converged Systems Tracker, Q1 2017, June 2017, Vendor Revenue.

<sup>9</sup> IDC WW Quarterly Enterprise Storage Systems Tracker, September 2017, Vendor Revenue — EMC Q2 2017.

<sup>10</sup> IDC WW Virtual Machine and Cloud System Market Shares 2016, July 2017.

<sup>11</sup> Dell EMC Pulse, "[Gartner Recognizes EMC as a Leader in the 2016 Data Center Backup and Recovery Software Magic Quadrant](#)," June 2016.

<sup>12</sup> IDC WW Semiannual Software Tracker, 2H2016, April 2017.

“We’re very excited to push the boundaries of [machine learning, device simulation and autonomous systems]. These researchers really need the kind of supercomputing we can provide with the new Dell EMC system with the revolutionary Intel Knights Landing processor. Each processor can do thousands of operations at once, while also being connected together with an incredibly powerful network.”

— Jeremy Kepner, Laboratory Fellow and head of MIT’s Lincoln Laboratory Supercomputing Center

[Watch the video for more.](#)

## World-class Dell EMC HPC Innovation Centers

### Leverage these invaluable assets

Customers can work directly with Dell EMC HPC experts to test and tune solutions prior to purchase at worldwide Dell EMC HPC Innovation Centers.

- [Dell EMC HPC Innovation Lab](#)
- [Cambridge Solution Centre](#)
- [University of Pisa](#)
- [San Diego Supercomputer Center](#)
- [Texas Advanced Computing Center \(TACC\)](#)
- [Centre for High Performance Computing in S.Africa](#)

## Customer successes

Reduced by 2–10X the time taken to do analysis at the [MIT Lincoln Laboratory Supercomputing Center \(LLSC\)](#).

[University of Pisa](#) is using deep learning technologies from Dell EMC for DNA sequencing, encoding DNA as an image.

Dell EMC is collaborating with the [Chinese Academy of Sciences](#) on a joint artificial intelligence and advanced computing laboratory.

[Mastercard®](#) is using artificial intelligence to protect their customers from fraud.

For more customer success stories, visit the [Dell EMC Customer Stories portal](#).

## Services and financing

Dell EMC understands that your success with machine and deep learning initiatives depends on each server, network and storage component being configured correctly. Proper deployment can represent a significant investment of time and resources. That’s why organizations of all sizes turn to Dell EMC and Dell EMC partners to provide the services you need to succeed.

### Dell EMC Professional Services

Dell EMC Consulting Services for AI, Machine and deep learning use a flexible delivery model with services for optimizing machine and deep learning investments. Dell EMC Services and partners can provide the services you need to succeed with AI.

The [Dell EMC Big Data Vision Workshop](#) helps you define how big data and analytics can transform your business. This consulting engagement leverages Dell EMC Services’ proven methodology to collaborate with the business and IT to envision, identify and prioritize big data business opportunities as well as provide a roadmap for executing that vision.

[Dell EMC ProDeploy](#) experts have the experience, expertise and best practices to enhance success as you plan, design and implement Dell EMC machine and deep learning solutions. With our proven track record of success in thousands of engagements worldwide, you can rely on Dell EMC as your partner.

Once the solution is deployed, [Dell EMC Remote HPC Cluster Management](#) services help keep it running smoothly with proactive monitoring and management of the entire solution.

[Dell EMC ProSupport](#) offers a single point of accountability from experts with solution-specific training, along with premium hardware and software support available 24x7. ProSupport also 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.

### Dell EMC Financial Services

The wealth of leasing and financing options from Dell EMC Financial Services can help you find opportunities when you're facing decisions regarding capital expenditures, operating expenditures and cash flow. Dell EMC offers a wide range of payment options to make it easier than ever to meet your needs.

- Leasing and financing solutions are available throughout the U.S., Canada and Europe.
- Dell EMC Financial Services can help finance your technology solution.
- Electronic quoting and online contracts offer an efficient purchase experience.

Learn more about [Dell EMC Financial Services](#).

### Why wait?

Learn more today about how you can quickly deploy an efficient, scalable, flexible solution designed to power machine and deep learning initiatives. Contact your Dell EMC or authorized partner sales representative, visit the [Dell EMC Machine Learning Knowledge Center](#), join the HPC Community at [dellhpc.org](http://dellhpc.org), or visit [dell EMC.com/ai](http://dell EMC.com/ai) to learn more.

### Contact us

To learn more, visit [dell EMC.com/ai](http://dell EMC.com/ai) or [contact](#) your local representative or authorized reseller.



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