

Find your edge

Comprehensive solutions for the manufacturing edge from Dell Technologies

Manufacturing



75.44 billion

The number of Internet of Things (IoT)-connected devices projected worldwide by 2025²

\$520 billion

The projected reach of markets for IoT hardware, software, systems integration and telecom and data services by 2021³

33%

The percentage of companies processing data in real time⁴

Every factory and production line is a potential source of valuable data for the organization that owns it. With the right technologies, manufacturing businesses can capture key metrics—including conveyor belt speeds, product quality, employee movements and much more—and analyze that data, gaining valuable insights that can optimize current processes and lower operational costs for higher returns.

To minimize data latencies and bandwidth costs, manufacturers are shifting applications and their underlying compute resources from the cloud and core data centers to the edge. Gartner estimates that, by 2022, enterprises will be creating and processing over 50 percent of their data outside the data center or cloud.¹ But selecting and implementing the right technologies for these edge environments is not straightforward. With wildly varying temperatures and minimal space for IT, factories and production plants are not friendly to traditional IT. Servers may be subject to shocks and vibrations from the factory floor, extreme temperatures and dust or other byproducts. In addition, companies are faced with the challenge of ensuring that new technologies are compatible with older or existing technologies, servicing devices in inaccessible locations and protecting data from cyberattacks or ransomware.

To meet these challenges, manufacturers need solutions designed to optimize data collection and analysis at the edge. Dell Technologies offers a unified family of platforms that enable a consistent approach to deploying hardware and applications and managing infrastructure and data. This brief expands on key portfolio offerings, with a particular emphasis on the new Dell EMC PowerEdge XE2420.

How edge applications are impacting corporate infrastructure

Companies are no longer bound to the constraints that forced IT into time-, planning- and cost-intensive infrastructure deployments requiring centralized data center expansions and added bandwidth. Instead, companies can now use a more modular approach by deploying localized IT in a smaller footprint onsite. These faster rollouts pave the way for:

- Automation capabilities
- Faster access to operational insights
- New opportunities for markets that were previously out of reach due to logistical, geographic or political constraints

Best practices for manufacturing companies at the edge

Manufacturers need to create a seamless exchange between IoT data collected via:

- **Devices at the edge** (such as assembly line sensors)
- **Compute at edge locations** (such as small data centers at production plants)
- **Compute at centralized data centers**, where more power is available to further analyze IoT data for improving predictive analytics

By harnessing the potential of edge technologies, manufacturers can optimize the following processes:

- **Output:** Using data from sensors on an assembly line, manufacturers can **optimize equipment to operate at peak performance**.
 - For example, a company could determine the point at which increased output affects a conveyor belt's basic operational functioning, then ensure the flow of goods never exceeds that threshold.
 - Video surveillance data could be used to examine traffic patterns within a factory, and machine learning models applied to make the movements of machines and people more efficient.
- **Maintenance and repairs:** Businesses can use machine learning models to **predict equipment failures and proactively address them** before they happen.
 - For instance, sensors indicating that a motor is at risk of overheating could trigger a protocol for calling a maintenance worker to examine the motor.
 - Schindler Elevator Corporation has implemented a predictive maintenance model for over 60,000 elevators and escalators worldwide.⁵ According to MHI Solutions, the company "installs sensors in every elevator and builds a digital replica of it from those sensors. Using the digital twin, Schindler technicians can detect when something is about to fail and make a proactive service call equipped with the right parts."⁶

The Dell EMC portfolio has solutions to suit every need, from the core to the cloud to the edge

iDRAC9 Datacenter

The new Datacenter license for iDRAC9 includes telemetry streaming, real-time BIOS Live Scanning, automatic SSL certificate enrollment and renewal and enhanced thermal management.

Dell EMC PowerEdge XR2

Traditionally, IT has owned server purchasing decisions while OT owns everything outside of the data center. The Dell EMC PowerEdge XR2 changes the game with a platform that both organizations can agree on. Built from the ground up for harsh environments, this compact solution is temperature resilient and shock resistant and has a minimal footprint.

- **Security:** Video surveillance can be used to **scan for both internal and external threats**.
 - Sensors or radio-frequency identification (RFID) tags in a factory can also help detect abnormalities, such as an open door in a loading bay or data center that could lead to security breaches.
- **Scheduling:** In areas where power grid outages are frequent, manufacturers can use sensor data to **predict when these outages will take place and adjust manufacturing schedules accordingly**.
- **Transportation:** Using GPS data, manufacturers can track the routes delivery trucks take and **optimize these routes or better predict when items will be delivered**.

Top 5 considerations for manufacturing companies at the edge

To implement these best practices, manufacturing companies need a compute solution with the right mix of durability, speed, storage capacity, management capability and serviceability. The table below shows how the Dell EMC PowerEdge XE2420, powered by Intel, meets these needs.

Requirements for manufacturers with infrastructure at the edge	How the Dell EMC PowerEdge XE2420 addresses these needs	How manufacturing companies can benefit
1. High reliability in harsh environments: Manufacturers need a rugged solution that can withstand harsh conditions—whether in a distribution center with limited climate control or a factory where heavy-duty equipment is creating shocks and vibrations	Extended operating temperature tolerance (from 5° to 40° C), optional filtered bezel to protect equipment in dusty environments and Network Equipment-Building System (NEBS) Level 1 certification	Save on repair and maintenance costs with a rugged solution optimized for inhospitable edge environments
2. Speed: Compute must be able to deliver data (such as sensor data from machines that can be used for predictive maintenance) quickly	Low-latency system with fast networking and high network throughput (from 1-100 Gbe)	Support bandwidth-hungry applications and workloads and deliver data quickly, enabling faster data analysis
3. Large storage capacity: Massive volumes of data—whether from surveillance footage or assembly line sensors—require massive amounts of storage	The PowerEdge XE2420 can be configured with up to 92 TB of storage	Increase data center density and meet high storage demands
4. Low-touch management: Manufacturers need to ensure that key services can be deployed remotely and without high IT involvement	The new Datacenter license for the embedded management tool iDRAC9 offers low-touch management features like automatic SSL certificate enrollment and renewal	Unify management practices across core operations, the cloud and the edge
5. Easy servicing and maintenance: Manufacturers need a solution that maintenance staff can access and service without hassle, even in smaller spaces or within infrastructures not optimized for edge technologies	Front-accessible I/O and power	Easily access equipment even in cramped or confined environments

In addition, manufacturing companies need a solution that can:

- Support advanced analytics and machine learning training and inference
- Fit into confined spaces (such as a small data center at a plant)
- Integrate into existing setups (such as a two-post rack)
- Protect data from malicious actors

To meet these needs, the Dell EMC PowerEdge XE2420 has a short-depth (600mm) form factor, supports up to four accelerators and employs real-time BIOS Live Scanning with the iDRAC9 Datacenter license.

Applications at the edge

- Plant automation
- Robotics
- Analytics
- Smart supply chains
- Logistics
- Video analytics
- Fleet and asset management



Reap the benefits of an optimized infrastructure with solutions designed for the edge

With data captured at the edge, businesses can analyze key metrics and use those insights to optimize their manufacturing processes, increase efficiency and lower operational costs. But to implement these innovations, they need equipment that has been designed to deliver durability, power, manageability and security at the edge.

Dell Technologies offers a full portfolio of solutions to address the compute, network and storage needs of manufacturing companies operating at the edge.

With Dell EMC PowerEdge XE2420 servers and iDRAC9 management software, organizations can increase their return on investment, lower total cost of ownership and protect their valuable data. From the edge to the cloud to the core data center, Dell Technologies helps companies thrive.

To learn more about how Dell Technologies solutions can help your company gain an edge, visit <https://www.delltechnologies.com/en-us/servers/specialty-servers/PowerEdge-XE-Servers>.

Intel and Dell Technologies:

Working together to create comprehensive solutions for the edge

Manufacturing environments require low-touch, rigorous compute platforms that can be managed with the same tools used by core IT departments. iDRAC9 Datacenter system management capabilities in the Dell EMC PowerEdge XE2420 integrate with telemetry solutions from Intel to provide customers with a seamless experience from the core to the edge. Services like Intel Secure Device Onboard help deploy platforms at scale and provide ongoing lifecycle capabilities when updates are needed but must adhere to low-touch requirements. The ability to run various manufacturing workloads and use tools to gain additional insights, coupled with the Dell EMC PowerEdge XE2420, helps customers leverage the latest capabilities from their trusted partners at the edge: Dell Technologies and Intel.

¹ <https://www.bain.com/insights/unlocking-opportunities-in-the-internet-of-things/>

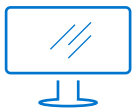
² <https://www.techrepublic.com/article/data-streaming-on-the-rise-according-to-developers/>

³ <https://www.gartner.com/en/newsroom/press-releases/2018-12-03-gartner-says-the-future-of-it-infrastructure-is-always-on-always-available-everywhere>

⁴ <https://www.statista.com/statistics/471264/iot-number-of-connected-devices-worldwide/>

⁵ <https://www.bain.com/insights/unlocking-opportunities-in-the-internet-of-things/>

⁶ https://www.mhisolutions-digital.com/mhiq/0119_volume_7__issue_1/MobilePagedArticle.action?articleId=1450536#articleId1450536



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