DELL Technologies

Spec Sheet

Dell Validated Design for Manufacturing Edge with PTC

Solution Overview

The Dell Validated Design for Manufacturing Edge with PTC is a scalable and interoperable solution to consolidate applications and power live insights for operational excellence. The solution simplifies infrastructure complexities at the edge and leverages PTC's ThingWorx platform with the Digital Performance Management (DPM) extension for continuous, prioritized process improvement.

- Consolidate for agility and efficiency by eliminating silos and simplifying the complexity of infrastructure management.
- Optimize with prioritized operational insights shared in real time across the operations hierarchy to facilitate decisions that unlock production hours.
- Scale up securely with fast, secure, and resilient edge performance using the underlying VxRail, from initial factory pilots to a global rollout.

Solution Detail

Within the Dell Validated Design for Manufacturing Edge with PTC, the following elements comprise the architecture.

- **Dell VxRail:** The VxRail hyperconverged infrastructure creates a turnkey deployment at the edge that offers maximum flexibility for HA, scale, and consolidation of OT workloads and applications. The VxRail underpins this joint solution with PTC – running both Thingworx and Kepware VMs as virtual machines.
- **Dell EMC Edge Gateway 5200:** The Edge Gateway helps companies connect OT/IT environments and extract value from edge-generated data with no interruptions to their infrastructure. Designed in a rugged, fanless design, the edge gateway is compact and robust enough to endure 24/7/365 operations. It powers real-time insights that will lead to better efficiency, lower costs, and greater performance for your business. Within this solution, the Dell Edge Gateway delivers industrial connectivity and IT/OT convergence with PTC Kepware.
- **PTC Thingworx:** Thingworx is a complete IIoT application platform that empowers industrial enterprises to digitally transform every aspect of their business with innovative solutions that are simple to create, easy to implement, and scalable to meet future needs and accelerate time to value.
- **PTC Kepware:** Designed for accurate communications, quick setup, and interoperability between client applications, industrial devices, and systems. It provides a wide range of plug-ins, device drivers, and components that suit most communication needs. Kepware enables convergence at the IT/OT layer within this solution.
- **PTC Digital Performance Management:** To drive continuous process improvement "beyond OEE", unlock production hours with PTC's Digital Performance Management.
    - Top-Down Performance Management conveyed in a singular metric, "Time Lost"
    - Continuous, real-time, closed loop problem solving
    - In-context measurement for production workers
    - Focus on priority process issues and use cases in manufacturing
    - Fast time to value and rapid implementation

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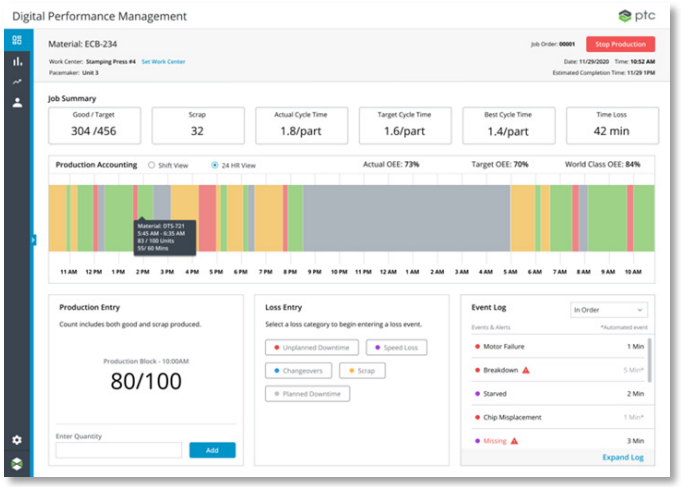

Technical Specifications

These are the recommended configurations based on the Dell Validated Design.

PowerEdge Specifications

	CPU	Cores	Threads	Memory
XR11 single node	1x Intel® Xeon Silver 4316 2.3 GHz	20	40	96 GB
XR12 Single Node	1x Intel® Xeon Silver 4316 2.3 GHz	20	40	96 GB
R650 Single Node	2x Intel® Xeon Silver 4310 2.1 GHz	12 per socket	24 per socket	96 GB
R750 Single Node	2x Intel® Xeon Silver 4310 2.1 GHz	12 per socket	24 per socket	192 GB

VxRail Specifications

	CPU	Cores	Threads	Memory
E660F Single Node	1x Intel® Xeon® Silver 4314 2.4 GHz	16	32	128 GB
P670F Single Node	2x Intel® Xeon® Gold 6246 3.1 GHz	16 per socket	32 per socket	256 GB

Edge Gateway Specifications

Features	EGW-5200		
Processor	Intel®Core™ i7-9700TE	Intel®Core™ i3-9100TETDP35W	Intel®Core™ i3-9100TETDP35W
# of Cores	8	6	4
Base Freq.	1.8 GHz	2.2 GHz	2.2 GHz
Max Turbo Freq.	3.8 GHz	3.6 GHz	3.2 GHz
Chipset	C246		
Memory	2x DDR4 SO-DIMMs, up to 64 GB		
Storage	2.5" SATA 2x Internal		
Power Supply	AC Input (optional): 180 W / 220 W, 60 W (for PoE) external AC/DC adapter DC Input: 12–24 V (±10% tolerance)		

PTC Software Specifications

Product	Software Version	Base Operating Systems
PTC Thingworx	Thingworx Foundation 9.3.2.0	Windows Server 2019 Linux Red Hat
PTC Thingworx Edge	Kepware Server 6.11.718.0	Windows Server 2019 Linux Red Hat
PTC DPM	DPM 1.1.0.0	N/A

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Solution Sizing

Small-scale configurations – PowerEdge and VxRail

Specification	PowerEdge XR11	PowerEdge XR12	PowerEdge R650	VxRail E660F
Compute and memory				
CPU	1x Intel Xeon Silver 4316 2.3 GHz	1x Intel Xeon Silver 4316 2.3 GHz	2x Intel Xeon Silver 4310 2.1 GHz	1x Intel Xeon Silver 4314 2.4 GHz
Cores	20	20	12 per socket	16
Threads	40	40	24 per socket	32
Memory	96 GB	96 GB	96 GB	128 GB
Storage				
Cache	N/A	N/A	N/A	1x 800 GB SSD SAS
Capacity Drives	4x 1.92 TB SSD vSAS	4x 1.92 TB SSD vSAS	4x 1.92 TB SSD vSAS	3x 1.92 TB SSD vSAS capacity drives per node
BOSS Card (RAID 1)	2x M.2 240 GB	2x M.2 240 GB	2x M.2 240 GB	2x M.2 480 GB
Networking				
Integrated physical interface	4x 25 GbE SFP28	4x 25 GbE SFP28	2x 10/25 GbE SFP28	2x 10/25 GbE SFP28
Platform				
Power: AC PSU	1400 W 100–240 V	2x 800 W 100–240 V	2x 1400 W 100–240 V	2x 1100 W 100–240 V
Dimensions	42.8 mm/1.68" H 482.6 mm/19" W 477 mm/18.77" D	42.8 mm/1.68" H 482.6 mm/19" W 477 mm/18.77" D	42.8 mm/1.68" H 482.6 mm/19" W 787.05 mm/31" D	42.8 mm/1.68" H 482.6 mm/19" W 477 mm/18.77" D
Weight	13.8 kg / 30.5 lb	13.8 kg / 30.5 lb	21.2 kg / 46.7 lb	21 kg / 46.2 lb
Fans	6	6	4 x 2	4
Operating environment				
Ambient operating temperature	5–40°C / 41–104°F	5–40°C / 41–104°F	10–35°C / 50–95°F	5–40°C / 41–104°F
Operating relative humidity	8–85% (non- condensing)	8–85% (non- condensing)	8–80% (non- condensing)	8–85% (non- condensing)
Operating altitude with no deratings	3048 m approx. 10,000 ft	3048 m approx. 10,000 ft	3048 m approx. 10,000 ft	3048 m approx. 10,000 ft
Heat dissipation	1400 W: 4100 BTU/h	800 W: 3139 BTU/h	1400 W: 5459 BTU/h each	1400 W: 4299 BTU/h each

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Medium-scale configurations – PowerEdge

Specification	PowerEdge XR11	PowerEdge XR12	PowerEdge R650	PowerEdge R750
Compute and memory				
CPU	1x Intel Xeon Gold 5318N 2.1 GHz	1x Intel Xeon Gold 5318N 2.3 GHz	2x Intel Xeon Silver 4310 2.1 GHz	2x Intel Xeon Silver 4310 2.1 GHz
Cores	24	24	12 per socket	12 per socket
Threads	48	48	24 per socket	24 per socket
Memory	192 GB	192 GB	192 GB	192 GB
Storage				
Capacity Drives	3x 3.84 TB SSD vSAS	3x 3.84 TB SSD vSAS	3x 3.84 TB SSD vSAS	3x 3.84 TB SSD SAS
BOSS Card (RAID 1)	2x M.2 240 GB	2x M.2 240 GB	2x M.2 240 GB	2x M.2 240 GB
Networking				
Integrated physical interface	4x 25 GbE SFP28	4x 25 GbE SFP28	2x 10/25 GbE SFP28	2x 10/25 GbE SFP28
Platform				
Power: AC PSU	2x 1400 W 100–240 V	2x 800 W 100–240 V	2x 1400 W 100–240 V	2x 1400 W 100–240 V
Dimensions	42.8 mm/1.68" H 482.6 mm/19" W 477 mm/18.77" D	42.8 mm/1.68" H 482.6 mm/19" W 477 mm/18.77" D	42.8 mm/1.68" H 482.6 mm/19" W 787.05 mm/31" D	42.8 mm/1.68" H 482.6 mm/19" W 787.05 mm/31" D
Weight	13.8 kg / 30.5 lb	13.8 kg / 30.5 lb	21.2 kg / 46.7 lb	21.2 kg / 46.7 lb
Fans	6	6	4 x 2	4 x 2
Operating environment				
Ambient operating temperature	5–40°C / 41–104°F	5–40°C / 41–104°F	10–35°C / 50–95°F	10–35°C / 50–95°F
Operating relative humidity	8–85% (non- condensing)	8–85% (non- condensing)	8–80% (non- condensing)	8–80% (non- condensing)
Operating altitude with no deratings	3048 m approx. 10,000 ft	3048 m approx. 10,000 ft	3048 m approx. 10,000 ft	3048 m approx. 10,000 ft
Heat dissipation	1400 W: 4100 BTU/h each	800 W: 3139 BTU/h each	1400 W: 5459 BTU/h each	1400 W: 5459 BTU/h each

Medium-scale configuration – VxRail

Specification	VxRail E660F
Compute and memory	
CPU	2x Intel Xeon Silver 4310 2.1 GHz
Cores	10 per socket
Threads	20 per socket
Memory	256 GB
Storage	
Cache	2x 800 GB SSD SAS
Capacity Drives	4x 3.84 TB SSD SAS capacity drives per node
BOSS Card (RAID 1)	2x M.2 480 GB
Networking	
Integrated physical interface	2x 10/25 GbE SFP28
Platform	
Power: AC PSU	2x 1400 W 100–240 V
Dimensions	42.8 mm/1.68" H
Weight	21 kg / 46.2 lb
Fans	4
Operating environment	
Ambient operating temperature	10–30°C / 41–104°F
Operating relative humidity	10–80% (non-condensing)
Operating altitude with no deratings	3048 m approx. 10,000 ft
Heat dissipation	1400 W: 41000 BTU/h each

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Large-scale configurations – PowerEdge and VxRail

Specification	PowerEdge R650	PowerEdge R750	VxRail E660F	VxRail P670F
Compute and memory				
CPU	2x Intel Xeon Platinum 8368 2.4 GHz	2x Intel Xeon Platinum 8368 2.1 GHz	2x Intel Xeon Gold 6326 2.9 GHz	2x Intel Xeon Gold 6246 3.1 GHz
Cores	38 per socket	38 per socket	16 per socket	16 per socket
Threads	76 per socket	76 per socket	32 per socket	32 per socket
Memory	256 GB	256 GB	256 GB	256 GB
Storage				
Cache	N/A	N/A	2x 800 GB SSD SAS	2x 800 GB SSD SAS
Capacity Drives	6x 3.84 TB SSD vSAS	6x 3.84 TB SSD vSAS	6x 3.84 TB SSD SAS capacity drives per node	6x 3.84 TB SSD SAS capacity drives per node
BOSS Card (RAID 1)	2x M.2 240 GB	2x M.2 240 GB	2x M.2 480 GB	2x M.2 480 GB
MicroSDHC/SDXC	N/A	N/A	N/A	64 GB
Networking				
Integrated physical interface	2x 10/25 GbE SFP28	2x 10/25 GbE SFP28	2x 10/25 GbE SFP28	4x 10 GbE SFP28
Platform				
Power: AC PSU	2x 1400 W 100–240 V	2x 1400 W 100–240 V	2x 550 W 100–240 V	2x 1400 W 100–240 V
Dimensions	42.8 mm/1.68" H 482.6 mm/19" W 787.05 mm/31" D	42.8 mm/1.68" H 482.6 mm/19" W 787.05 mm/31" D	42.8 mm/1.68" H 434 mm/17.09" W 433 mm/29.61" D	86.8 mm/3.42" H 434 mm/17.09" W 647 mm/25.47" D
Weight	21.2 kg / 46.7 lb	21.2 kg / 46.7 lb	21 kg / 46.2 lb	23.72 kg / 52.29 lb
Fans	4 x 2	4 x 2	6	6
Operating environment				
Ambient operating temperature	10–35°C / 50–95°F	10–35°C / 50–95°F	10–35°C / 50–95°F	10–35°C / 50–95°F
Operating relative humidity	8–80% (non- condensing)	8–80% (non- condensing)	8–80% (non- condensing)	8–85% (non- condensing)
Operating altitude with no deratings	3048 m approx. 10,000 ft	3048 m approx. 10,000 ft	3048 m approx. 10,000 ft	3048 m approx. 10,000 ft
Heat dissipation	1400 W: 5459 BTU/h each	1400 W: 5459 BTU/h each	1400 W: 5459 BTU/h each	1400 W: 5459 BTU/h each

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